



ROYAL BOTANIC GARDENS, KEW

BULLETIN OF
MISCELLANEOUS
INFORMATION

1935



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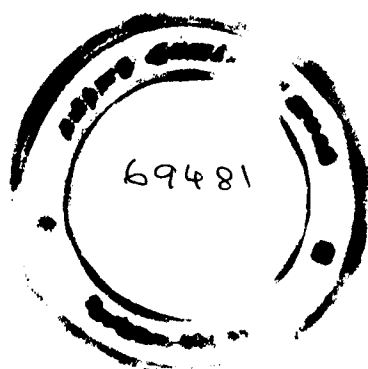
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BULLETIN OF MISCELLANEOUS INFORMATION No. 1 1935 ROYAL BOTANIC GARDENS, KEW

I.—THE GENUS *CLYPEOLA* AND ITS INTRASPECIFIC VARIATION. D. A. CHAYTOR and W. B. TURRILL

The genus *Clypeola* is a small genus of annual cruciferous herbs, limited in distribution to the Mediterranean Region. In many characters it shows resemblances to the much larger genus *Alyssum*. It is distinguished especially by ripening only one seed in a fruit, the latter being normally indehiscent till the commencement of germination, i.e. technically the fruit is an achene derived from a silicule. Two ovules in an ovary have been observed, at least once, though usually only one is present.

We accept nine species of *Clypeola*, including one (*C. Raddeana* Alb.) which is doubtful. These species are clearly distinguishable one from another by morphological characters and partly also by geographical distribution. The most widely distributed species is *C. Jonthlaspi* L. This occurs over most or all of the area covered by the genus. It is also by far the most polymorphic species and for this reason is the most difficult, but the most interesting, taxonomically.

In the account which follows we refer briefly to the Linnean and immediately pre-Linnean history of the genus, give a key to the species, descriptions of the species with their distribution, synonymy, and intraspecific variation, and conclude with a discussion of the results of the investigation as it bears on wider taxonomic problems.

GENERIC HISTORY.

Linnaeus based his genus (Gen. Plant. ed. 1, 193 : 1737) on Tournefort's *Jonthlaspi* (Tournefort, Instit. 210, t. 99 : 1719). The two species recognized by Tournefort are: "1, *Jonthlaspi luteo flore*, *incanum*, *montanum*, *Διονυσοειδές* Col. Part. I. 280. *Thlaspi saxatile*, *incanum*, *luteum*, *Serpilli folio*, *minus* C.B. Pin. 107. 2, *Jonthlaspi minimum*, *spicatum*, *lunatum* Col. Part. I. 284. *Thlaspi clypeatum*, *Serpilli folio* C. B. Pin. 107. *Lunaria peltata*, *minima* quibusdam, ad *Thlaspi* referenda J.B. 2. 935."

Of these the former is probably a species of *Alyssum*; the latter is, from Columna's (Colonna's) figure, undoubtedly *Clypeola Jonthlaspi* as now understood and is probably the variety with medium or large fruits and hairy disc and wing. It is quoted by Linnaeus, Sp. Pl. 652 (1753) under his *C. Jonthlaspi*. Miss Green is, therefore, quite correct in accepting *C. Jonthlaspi* as the type species of the genus *Clypeola* (Kew Bull. 1925, 53).

In the Species Plantarum (p. 652: 1753) four species are included in the genus: *C. Jonthlaspi*, *C. Alyssoides*, [*C. tomentosa*], and *C. maritima*. In the second edition (p. 910: 1763) only *C. Jonthlaspi* and *C. maritima* are retained. Of the Linnean species *C. maritima* is now placed in *Alyssum* [as *A. maritimum* (L.) Lam.], in *Lobularia* [as *L. maritima* (L.) Desv.], or in *Konigia* [as *K. maritima* (L.) R. Brown]. There are two specimens in the Linnean Herbarium. *C. alyssoides* is now relegated to *Alyssum* as *A. alyssoides* (L.) L. Syst. ed. 10, 1130 (1759), with *A. calycinum* (L.) Sp. Pl. ed. 2, 908 (1763) as a synonym. The name *C. tomentosa* was not printed (marginally) in the first edition of the Species Plantarum though the description, reference, and synonym are given. The name was first published in Mant. 92 (1767) and is thus antedated by *Alyssum orientale* Ard. Animad. Alt. 32 (1759). There is one specimen in the Linnean Herbarium which is written up as *A. Orientale* Ard.

C. Jonthlaspi L. is finally based on Columna's figure [Fabii Columnae Lyncei 284 (1616)]. The species is well established from this figure and the accompanying description and the actual variety represented may be that with medium or large fruits (over 3 mm. broad), hairy wing, and hairy disc. It is, however, not possible to be quite certain. In the Linnean Herbarium there is one sheet with four specimens. The stems are up to 8.5 cm. high and the leaves narrowly oblanceolate-spathulate. In three specimens the fruits have 4 mm. diam. and hairy disc and wing, in one specimen 4 mm. diam. and glabrous disc and hairy wing.

Modern generic descriptions are given in Benth. et Hook. fil. Gen. Pl. 1, 65, 93 (1862) and in Engler u. Prantl. Pflanzenfam. III. 2. 194-5 (1891).

KEY TO SPECIES.

1. Planta haud divaricatim ramosa, infructescentiis elongatis.
2. Siliculae 6 mm. diam., vel saepissime angustiores, haud grosse crenulatae.
3. Siliculae membranaceae alatae.
4. Siliculae ala plana.....1. *C. Jonthlaspi* L.
- 4.* Siliculae ala torquatim inflata.....
2. *C. elegans* Boiss. et Huert.
- 3.* Siliculae haud membranaceae alatae.
5. Siliculae hirsutae, lanatae vel setosae.
6. Siliculae pilis laevibus vel fere laevibus hirsuta vel densissime lanata.
7. Siliculae usque ad 4 mm. latae, pilis adpressis instructae densissime ciliatae.....
3. *C. ciliata* Boiss.
- 7.* Siliculae usque ad 6 mm. latae, pilis longissimis albis obtectae.....4. *C. eriocarpa* Cav.
- 6.* Siliculae setis rigidis retrorsum barbellatis echinatae.

8. Petala 2.5 mm. longa; stylus 0.5 mm. longus; pedicelli fructiferi arcuato-recurvi.....

5. *C. aspera* (Grauer) Turrrill.

8.* Petala 3.75-4 mm. longa; stylus 1.5 mm. longus; pedicelli fructiferi abrupte recurvi.....

6. *C. lappacea* Boiss.

5.* Siliculae tuberculatae.....7. *C. Raddeana* Alb.

2.* Siliculae 9 mm. diam., grosse crenulatae.....

8. *C. cyclodontea* Delile.

1.* Planta divaricatim ramosa, infructescentiis vix elongatis quam ramis junioribus brevioribus.....9. *C. dichotoma* Boiss.

DESCRIPTIONS OF SPECIES AND VARIATIONS.

1. *C. Jonthlaspi* L. Sp. Pl. 652 (1753).

An annual erect plant with slender stems, slightly to much branched at the base, up to 2.8 dm. high, but generally much shorter. Tap-root slightly or much branched, almost vertical. *Stems* terete, covered with closely adpressed small, greyish-white, stellate hairs with numerous long branches. *Leaves* narrowly oblanceolate to spatulate-oblanceolate or obovate, subacute to obtuse, narrowed below, 0.2-2.0 cm. long, 1-4 mm. broad, covered with stellate hairs, similar to those on the stem, on both surfaces, very dense on the lower, midrib (in dried material) slightly prominent on lower surface; leaves often fall off as fruit reaches maturity. *Inflorescence* in the young condition very compact, lengthening with age, axis with indumentum similar to that of the stem, ebracteate, ebracteolate; flower pedicels 1-2 mm. long. *Sepals* ovate to elliptic, subacute to obtuse, 0.9-1.75 mm. long, stellate hairs on outer surface, narrow membranous margin, persistent in young fruit, then caducous. *Petals* linear, elliptic or spatulate-oblanceolate, entire and obtuse, or slightly emarginate, 0.75-1.75 mm. long, well-defined midrib sometimes present, glabrous. The four longer *stamens* usually about 1.5 mm. long, filaments asymmetrically flat-winged, in the lower $\frac{1}{2}$ or $\frac{1}{3}$. On the adaxial side the wing much broader, ending in an erect acute tooth (occasionally bifurcated) about 0.5 mm. long; the two shorter stamens about 1.25 mm. long, with a membranous appendage arising from near the base on the adaxial side, flattened dorsiventrally, with two acute apical teeth. *Gynoecium* 0.75-1 mm. long excluding style up to 0.25 mm. long; ovary orbicular-elliptic, compressed, glabrous. *Fruit* ovate, obovate, suborbicular, orbicular-elliptic, or orbicular, 1.75-5.25 mm. long, 1.5-5 mm. broad, margin entire, apex slightly emarginate, style concealed in emargination, wing and disc or disc only or wing only covered with numerous long, tapering verruculose hairs interspersed with very numerous minute, irregularly verruculose hairs, or entirely glabrous; fruiting pedicels 1.5-3 mm. long, recurved. *Seed* elliptic, compressed, bi-convex, 0.75-1.25 mm. broad, 1.0-1.75 mm. long.

General synonyms : *Alyssum minimum* Villars, Hist. Pl. Dauph. 3, 292, 296 (1789) non L. sec. Verlot in Bull. Soc. Stat. Isère, 3me. sér., 3, 26 (1872).

Jonthlaspi clypeolatum Caruel in Parlatores, Fl. Ital. 9, 1049 (1893).

The above description of *C. Jonthlaspi* is a generalized one made to include a very wide range of material which for reasons given in our discussion (p. 22) we place under one polymorphic species. The range of variation includes such characters as habit, height, branching, leaf-size, degree of indumentum on vegetative parts, and fruit size, shape and indumentum. The variation is undoubtedly partly due to genetic differences, partly to reaction to different environmental conditions. Our experience suggests that the fruit characters are least easily modified by changing environments and therefore give the best diagnostic characters. This also appears to be the conclusion reached by most other authors who have studied the species. On the other hand some of the characters of the fruit, especially size, which is most conveniently stated in terms of silicule breadth, show a graded series of intermediate development. There is a considerable degree of correlation between fruit size and the size of the plant as a whole. Leaf-size and the amount of indumentum on the vegetative parts appear to be easily modified by habitat conditions.

In the following account of intraspecific variation we have divided the material studied into a number of variants, firstly, on the presence or absence and, if present, the distribution of hairs on the silicules and, secondly, on the fruit size. The following symbols enable a simple formula to be given to any specimen with mature fruit :

w=wing (in many previous descriptions referred to as margin, margo).

d=disc—the central portion of the silicule.

H=hairy.

G=glabrous.

L=large, the total diameter (wing and disc) of the silicule, 3.5 mm. or upwards.

M=medium, the total diameter of the silicule between 3.5 and 2.5 mm.

S=small, the total diameter of the silicule 2.5 mm. or less.

The following combinations are then possible :

var. 1. w H d H L=var. *pubescens* Car. et St. Lager.

var. 2. w H d H M=var. *lasiocarpa* Guss.

var. 3. w H d H S=var. *hispida* (Presl) Hal.

var. 4. w H d G L=var. *intermedia* Hal.

var. 5. w H d G M=var. *glabriuscula* Gruner.

var. 6. w H d G S

var. 7. w G d H L

var. 8. w G d H M

var. 9. w G d H S=var. *microcarpa* (Moris) Arcang.

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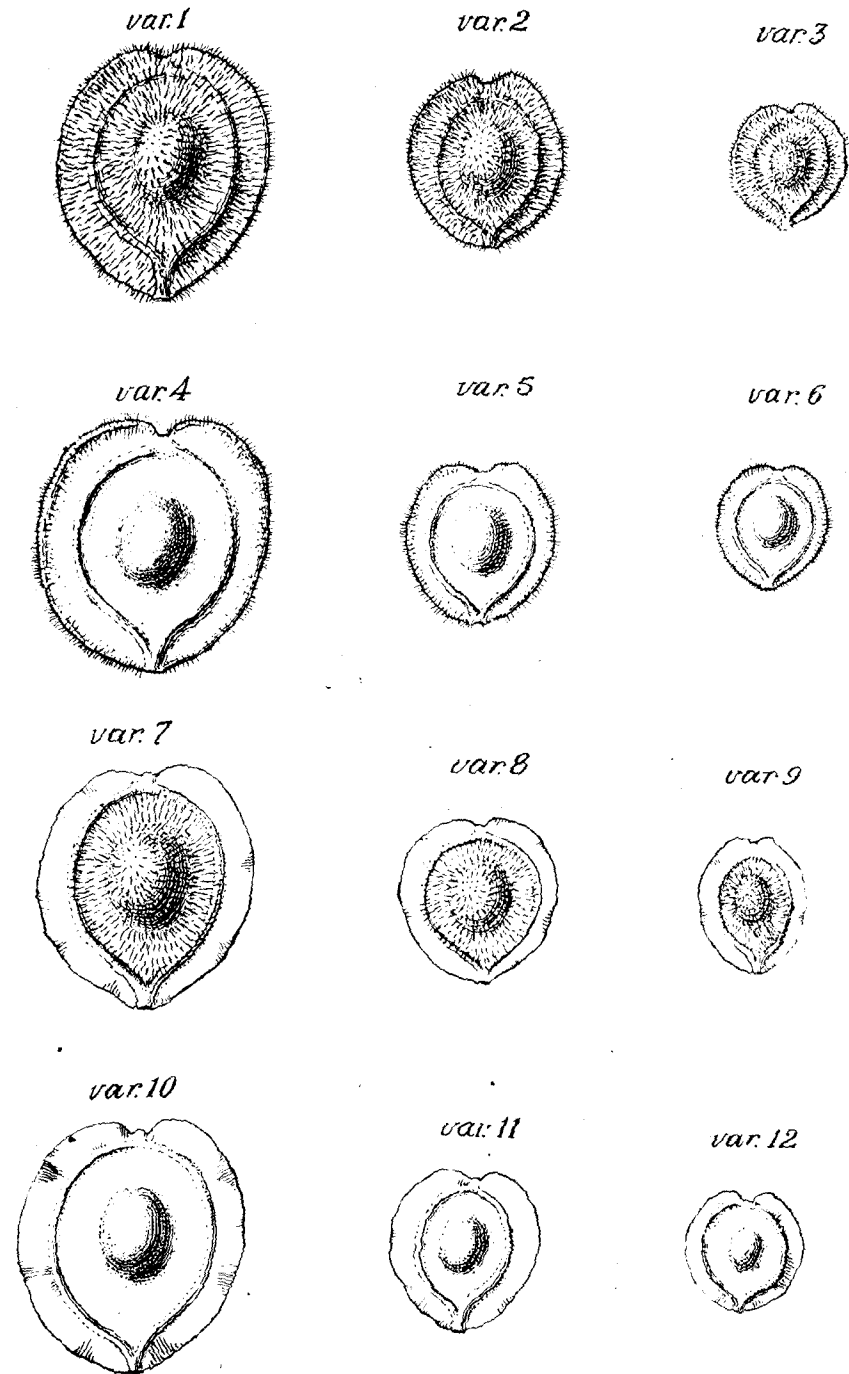


Fig. 1. Fruits of varieties of *Clypeola Jonthlaspi* $\times 6\frac{1}{2}$. The figure of var. 7 has been constructed by combining characters of other varieties, no specimens having been seen. The remaining varieties have been studied in living and/or dried material.

var. 10. w G d G L=var. *lejocarpa* Vis.

var. 11. w G d G M

var. 12. w G d G S=var. *glabra* (Boiss.) Reynier.

Of these all except var. 7 (w G d H L) have been represented in material studied by us.

Certain minor variations involving modifications of fruit shape and degree of development of indumentum are mentioned, but without using symbols. The actual diameters of the silicles are given in parentheses after the quoted specimens.

Variations in fruit characters :

var. 1, formula : w H d H L.

In addition to this formula there appear to be modifications due to supplementary factors for intensifying and for reducing the number of hairs on the fruits, though whether these factors are genetical or ecological it is not possible to say from available data. There is also a certain range in fruit shape and extreme examples are noted below.

Distrib.—SPAIN : Tarragona, *Sennen* (4.4–5 mm., hairs sparse).

FRANCE : Avignon, *Delacour* (4 mm.) ; cult. Mentone, *Moggridge* (4 mm.) ; Toulon, *Durieu de Maisonneuve* 15 (3.75 mm.) ; Aix-en-Provence (3–3.75 mm.) ; Beziers (3.5–4 mm.) ; Avignon, *Requien* (3.5–4 mm.) ; St. Jean de Maurienne, *Huguenin* (3.5 mm.) ; Drome, *Roux* (3.5–4.5 mm., rounded fruits) ; Montpellier, *Delile* (4 mm., fruit rounded) ; Perpignan, *Southby* (3.5 mm., hairs sparse) ; Grenoble, Mt. St. Eynard, *Blanc* (3–4 mm.).

SICILY : in montibus, *Gasparini* (3.5 mm., wing densely, disc sparsely hairy).

GREECE : Megaspilaion Achaiae, *Heldreich* 3484 (4 mm., very hairy fruits) ; Parnassus, *Mill* (4 mm., very hairy fruits) ; Pass of Decelea, *Mill* (3.75–4 mm.) ; Eurotas, *Mill* (4 mm.) ; Hymettus, *Heldreich* 3276 (3.5 mm.) ; Corydalus *Heldreich* 822 (4–5 mm.) ; Parnes, *Atchley* 227 and 1066 (3.5–4 mm.) ; Corinth, *Atchley* 1624A (4.5 mm.) ; nr. Athens, *Heldreich* (4.5 mm.).

CORFU : St. Salvador, *Talbot* (3.75–4 mm.).

ALBANIA : Melesinë, Leskovik, *Alston and Sandwith* 1769 (4.5–5 mm.) ; Gjinokastrë, *Alston and Sandwith* 1514 (4.5 mm.).

MACEDONIA : between Breznitsa and Krystallopegae, *Alston and Sandwith* 743 (5 mm., very hairy fruits) ; N. of Salonika, Mikra, *Hill, Sandwith, and Turrill* 2617 ; Asbestochoroi, *Hill, Sandwith, and Turrill* 2658c (3.75 mm.) ; Mt. Athos, Kapsokalivia Zographu, Dochiariou and between Kapsokalivia and Lavra, *Hill, Sandwith, and Turrill* 2471, 2487 (3.75–4.5 mm.).

DALMATIA : Mt. Marian, nr. Spalato, *Pichler* (3.5–4 mm.) ; Lesina, *Alexander* (3.75 mm.) ; Lesina, *Alexander Prior* (3–4 mm.).

CRIMEA : Nikita, *Wankow* (4 mm.).

CYPRUS : Pentedactylos, *Sintensis and Rigo* 270 (4.4–5 mm., rounded fruits).

ASIA MINOR : Renkoei Dumbrek, *Sintensis* 1000 (3.5 mm.) ; Amasia, *Bornmüller* 1344 (3.5 mm., hairs sparse) ; Antiphellus, *Forbes* 49 (3.5 mm.) ; Katara Pass, *Forbes* 50 (3.5–3.75 mm.) ; Armenia, *Szovits* (3.5–4.5 mm., hairs short) ; Mardin, *Hausknecht* (3.5–4 mm.) ; Armenia, Gumusch-Khané, *Bourgeau* 40 (3.5 mm.).

CAUCASUS : *Wilhelms* (3.5 mm.) ; Herb. Mus. Petrop. (4 mm., rounded fruit).

PALESTINE : Medaba, *Meyers and Dinsmore* (3 mm.).

IRAQ : Terek, *Hausknecht* (3.5 mm.).

SYRIA : *Aucher-Eloy* 360 (3.5 mm.).

Synonyms.

C. Jonthlaspi L. var. *lasiocarpa* Gruner in Bull. Soc. Imp. Nat. Mosc. 40, Pt. 2, 396 (1867) (or to var. 2).

C. Jonthlaspi L. var. *pubescens* Car. et Saint-Lager Etude des fleurs 61 (1889)—sec. Rouy et Fouc.

C. Jonthlaspi L. var. *suffrutescens* Debsc. et Neyr. in Bull. Soc. Hist. nat., Toulouse 1891, p. x.

Jonthlaspi clypeolatum Caruel var. *macrocarpa* Caruel in Parlatore Flor. Ital. 9, 1049 (1893) (or to var. 4, or to var. 7, or to var. 10).

C. suffrutescens Rouy et Fouc. Flor de Fr. 2, 162 (1895) (woody, suffruticose stems branched from the base).

C. Jonthlaspi L. var. *lasiocarpa* Strobl in Verh. zool.-bot. Ges. 53, 457 (1903).

C. Jonthlaspi L. subsp. *macrocarpa* Fiori var. *petraea* Fiori e descr. in Flor. Ital. Exsicc. 1278 (1910) et in Nuov. Giorn. Bot. Ital. N.S. 17, 610 (1910)—? excl. syn. Jord. et Fourr.

var. 2, formula : w H d H M.

Two subvariations are noted below as modifications of this formula.

Distrib.—SPAIN : Sierra de Segura, *Bourgeau* 568 (3 mm., hairs sparse) ; Granada, *Ellman and Sandwith* 567 (2.75 mm.) ; Almeria, *Ellman and Sandwith* 897 (3–3.5 mm.).

FRANCE : Mt. Cette, *Gay* (2.75–3 mm.) ; Ribiers, *Reverchon* (3 mm.) ; Lot, *Puel* (3.25 mm.) ; Montpellier, *Bentham* (3 mm.) ; Marseilles, *Billot* (2.75 mm.).

ITALY : Gargano, *Porta et Rigo* 148 (2.75–3 mm.) ; Etruria, Ins. Capraria, *Fiori and Beguinot* 1278 (3 mm.).

CORSICA : Bastia, *Salis* (3.4 mm.).

MACEDONIA : N. of Salonika, Mikra, *Hill, Sandwith, and Turrill* 2617, 2662 (2.5–3.5 mm.) ; Asbestochoroi, *Hill, Sandwith, and Turrill* 2581, 2658B (2.5–3 mm.).

ATHOS PENINSULA : Zographu and Simopetra, *Hill, Sandwith, and Turrill* (2.75–3.25 mm.).

THRACE : Mesta Valley, *Tedd* (3 mm.).

CRIMEA : Jalta and Massandra, *Golde* 1006 (3 mm.); Tauria, Sokoll, *Callier* 14 (3 mm.).

ASIA MINOR : Scutari, *Noé* (2.5–3 mm.); Egin, Szanduk, *Sintensis* 2275, (2.5–2.75 mm.); Kurdistan, Batos, *Guest* 578 (3 mm.).

PALESTINE : E. of Jordan, *Paine* (3 mm.); Rasheiyd (*ex herb. Post*) (3 mm.); Ain karim, *Edwards* 37 (3 mm.); Medaba, *Meyers and Dinsmore* (2.5–2.75 mm.).

SYRIA : Aleppo, *Kotschy* (3 mm.).

IRAQ : Euphrates, Gorluk, *Chesney* (2.75 mm.).

PERSIA : Kaman, *Pichler* (2–2.5 mm.).

BALUCHISTAN : Urak, *Lace* (3 mm.).

AFGHANISTAN : 1403 Distr. Cab., *Griffith* (2.5–3 mm.).

ARABIA PETRAEA, *McDonald* (2.5–3 mm.); *Schimper* 432 (2.75 mm.); Sinai, *Schimper* 415 (2.75 mm.).

ALGERIA : Mostaganem, *Balansa* 3 (2.75 mm.).

Synonyms.

C. monosperma Lam. Fl. Fr. **2**, 462, 484 (1778) (or to var. 1 or 3).

C. Jonthlaspi L. var. *lasiocarpa* Guss. Flor. Sic syn. **2**, i. 145 (1843) (from description; to var. 1 according to quoted figure).

C. hispidula Jord. et Fourr. Brev. Plant. Nov. **2**, 15 (1868) (or to var. 3).

C. petraea Jord. et Fourr. Brev. Plant. Nov. **2**, 14 (1868) (or to var. 1).

C. Jonthlaspi L. f. *Bruhnsii* Bush in Flor. Cauc. Crit. Cruciferae, 614 (1910).

C. Jonthlaspi L. var. *lasiocarpa*, forma *spathulifolia* Fiori in Flor. Ital. Exsicc. 1278 (1910) et in Nuov. Giorn. Bot. Ital. N.S. **17**, 610 (1910) excl. syn.

C. Jonthlaspi L. var. *petraea* Reynier in Bull. Géogr. Bot. **21**, 290 (1911).

C. Jonthlaspi L. var. *hispidula* (Presl.) Reynier in Bull. Géogr. Bot. **21**, 290 (1911).

Subvariation A. Hairs short and rather sparse.

Distrib.—SWITZERLAND, Valais; Bramois, *Hooker* (3 mm.); Sion, *Hooker* (3 mm.); Sion, *Wolf* (2.75–3 mm.).

Synonyms.

C. Gaudinii Trachsel in Flora **14**, 743 (1831).

C. Gaudinii Trachs. var. *lasiocarpa* Strobl. in Verh. zool.-bot. Ges. **53**, 457 (1903).

C. Jonthlaspi L. var. *Gaudinii* Reynier in Bull. Géogr. Bot. **21**, 290 (1911).

C. Jonthlaspi L. a. *Gaudinii* (Trachs.) b. *lasiocarpa* Lanza in Boll. Ort. Bot. Palermo **4**, 27 (1905) e descr.

C. Jonthlaspi L. subsp. *Gaudinii* (Trachs.) Fiori var. *typica* Fiori in Flor. Ital. exsicc. 1278 (1910) et in Nuov. Giorn. Bot. Ital. N.S. **17**, 611 (1910), et Thellung in Hegi Ill. Flor. Mitt.-Eur. **4**, i, 458 (1919).

Subvariation B. Hairs on wing dense, short, and clavate.

Distrib.—CORSICA : Rambur (3 mm.).

Synonyms.

C. spathulifolia Jord. et Four. Brev. Plant. Nov. **2**, 15 (1868).

C. hispida Presl. var. *spathulifolia* Rouy et Fouc. Fl. Fr. **2**, 164 (1895).

var. 3, formula : w H d H S.

Distrib.—SPAIN : Aranjuer, *Graels* (2.5 mm.); Reuter (2.25 mm.); Cerro la Matanza, *Willkomm* 70 (2 mm.); Granada, Alhambra, *Gourlay, Richards and Tutin* (2 mm.).

FRANCE : Chamonix (2.5 mm.); Marseilles, *Billot* (2.5 mm.).

SWITZERLAND : Tourbillon, Sion *Lagger* (2.5 mm., hairs sparse); Sion, *Thomas* (2.5 mm.); Lougeborgue, Valais, *Chenevard* (2.5 mm.).

SICILY : Castellbuono, *Strobl* (2.5 mm.).

GREECE : Pentelikon, *Pichler* (2.5 mm.); Corinth, *Atchley* 1625A, (2 mm.); Promontory of Munychea, *Mill* (1.75 mm.).

MACEDONIA : N. of Salonika, Asbestochoroi, *Hill, Sandwith, and Turrill* 2658A (2.25 mm.).

CONSTANTINOPLE : *Noé* 259 (2.5 mm.).

ASIA MINOR : Tokat, *Aucher-Eloy* 4081 (2.5 mm.).

IRAQ : Gorluk, *Chesney* 51 (2.5 mm.).

ARABIA : Sinai, *Schimper* 415 (2.25 mm.).

ALGERIA : Batna, *Choulette* 8 (2.5 mm.).

Synonyms.

C. hispida Presl. Bot. Bemerk. 9 (1844) (or to var. 2—the type is *Schimper* 415, from Sinai, and specimens at Kew of this number belong partly to var. 2 and partly to var. 3. No measurements are given in the original description.)

C. Bruhnsii Gruner in Bull. Soc. Imp. Nat. Mosc. **40**, Pt. 2, 396 (1867)?

C. microcarpa Moris var. *hispida* Hal. Consp. Fl. Graec. **1**, 117 (1900).

C. Jonthlaspi L. subsp. *Gaudinii* (Trachs.) Fiori var. *lasiocarpa* Fiori p.p. (and to var. 2) in Flor. Ital. exsicc. 1278 (1910) et in Nuov. Giorn. Bot. Ital. N.S. 17, 610 (1910).

C. Jonthlaspi L. var. *hispida* Reynier in Bull. Géogr. Bot. 21, 290 (1911).

C. Jonthlaspi L. subsp. *Gaudinii* (Trachs.) Thell. var. *microcarpa* (Moris) Arcang. subvar. *hispida* (Presl. non Rouy) Jahandiez et Maire in Cat. Pl. Maroc. 2, 307 (1932).

In addition to the specimens quoted above a number (collected by Bordère, Huter and Lager) from the Gavarnie district, French Pyrenees, are to be placed under this variety. All specimens seen from this locality have small or very small fruits (1.5-2.5 mm.) with hairy or slightly hairy, to glabrous wings, and more or less hairy discs. Those specimens with no hairs on the wings might technically be classed under var. 9, but have not the dense white disc indumentum. The Gavarnie population is apparently an isolated one, at an unusual altitude for the species, and the name *C. pyrenaica* Bordère in Actes Soc. Linn. Bord. 26, 85 (1866) has been applied to it, reduced to *C. Jonthlaspi* L. var. *pyrenaica* Reynier in Bull. Géogr. Bot. 21, 290 (1911).

var. 4, formula : w H d G L.

Distrib.—FRANCE : Villeneuve, Delacour (4-4.5 mm.) ; Marseilles, Tribout (3-75 mm.) ; Mireval, Bentham (5 mm.) ; nr. Vaucluse, Antunan (3.5-4 mm.) ; Vaucluse, Reverchon (3.5 mm.) ; Narbonne, Fourcade (3-25-4 mm.) ; Nice, Woods (4 mm.) ; Montpellier, Bentham (4 mm.) ; Bentham & Arnott (4.5 mm.).

ITALY : Naples, Hooker (3 mm., fruit rounded).

GREECE : Corinth, Atchley 1624C (3.5-4 mm.) ; Pass of Decelea, Mill (4.5 mm.) ; Hymettus, Heldreich 822 and 3276 (4 mm.).

MACEDONIA : Lembet, Turner (4.5 mm.) ; N. of Salonika, Mikra, Hill, Sandwith, and Turrill 2663 (4-5 mm.) ; Asbestochoroi, Hill, Sandwith, and Turrill 2582, 2657 (4-4.5).

DALMATIA : Mt. Marian, Spalato, Pichler (3-75 and 4 mm.).

CRIMEA : Sokoll, Callier 14 (3.5-4 mm.).

ASIA MINOR : Amasia, Bornmüller 1346 (4.5 mm.) ; Smyrna, Fleischer (4.5 mm.) ; Renkoei, Mt. Ulu-Dagh, Sintensis 1052 (4.5-5 mm.) ; Chio, Aucher-Eloy 284 (4.5 mm.).

CYPRUS : Pentedactylos, Sintensis et Rigo 270 (4 mm.).

SYRIA : Aleppo, Kotschy (4 mm.).

PALESTINE : Medaba, Meyers and Dinsmore (3.5 mm.).

IRAQ : Terek, Haussknecht (5 mm.) ; Gorluk, Chesney 51 (3.5 mm.) ; Assyria, Dejebel Taktak, Haussknecht (3-75-4 mm.).

Synonyms.

C. lapidicola Jord. et Fourr. Brev. Plant. Nov. 2, 14 (1868).

C. semiglabra Jord. et Fourr. ex Fourr. in Ann. Soc. Linn. Lyon, nouv. sér. 16, 334 (1868) et op. cit. 17, 194 (1869).

C. Jonthlaspi L. var. *intermedia* Hal. Consp. Fl. Graec. 1, 117 (1900) p.p.

C. Jonthlaspi L. var. *lejocarpa* Strobl. in Verh. zool.-bot. Ges. 53, 457 (1903).

C. Jonthlaspi L. var. *lapidicola* Reynier in Bull. Géogr. Bot. 21, 290 (1911).

var. 5, formula : w H d G M.

Distrib.—FRANCE : Marseilles, Tribout (3 mm.) ; Carpaigne, Billot 3318 (3 mm.).

CORSICA : Bastia, Salis (3-3.5 mm.).

MACEDONIA : N. of Salonika, Asbestochoroi, Hill, Sandwith, and Turrill 2583, 2656 (2-75-3.5 mm.).

Synonyms.

C. Jonthlaspi L. var. *glabriuscula* Gruner in Bull. Soc. Imp. Nat. Mosc. 40, Pt. 2, 396 (1867) (or to var. 4).

C. ambigua Jord. et Fourr. Brev. Plant. Nov. 2, 15 (1868) (or to var. 6).

C. lomatotricha Jord. et Fourr. ex Fourr. in Ann. Soc. Linn. Lyon, nouv. sér. 16, 334 (1868) et op. cit. 17, 194 (1869).

C. Jonthlaspi L. var. *intermedia* Hal. Consp. Fl. Graec. 1, 117 (1900) p. p.

C. Gaudinii Trachs. var. *lejocarpa* Strobl in Verh. zool.-bot. Ges. 53, 457 (1903) ?

C. Jonthlaspi L. subsp. *Gaudinii* (Trachs.) Fiori var. *ambigua* (Jord. et Fourr.) Fiori in Flor. Ital. Exsicc. Ser. II. 1278 (1910) et in Nuov. Giorn. Bot. Ital. N.S. 17, 610 (1910). (or to var. 6.).

C. Jonthlaspi L. var. *ambigua* Reynier in Bull. Géogr. Bot. 21, 290 (1911).

var. 6, formula : w H d G S.

Distrib.—CRIMEA : Inkerman, Crichton (2.5 mm.).

var. 7, formula : w G d H L.

No specimens seen.

var. 8, formula : w G d H M.

Distrib.—BALEARIC IS. : Majorca, Pollanza, Edmonds 66 (3 mm.) ; Edmonds 262 (3 mm.).

SICILY : Mt. Madoniarum, Strobl (2.5-3 mm., fruit orbicular).

GREECE : Corinth, Atchley 1624B (2.5-2.75 mm.).

Synonyms.

C. messanensis Tin. ex Strobl in Verh. zool.-bot. Ges. 53, 457 (1903).

var. 9, formula : w G d H S.

The plants under this formula have very uniform fruit characters. The short dense compact white indumentum of the disc being very conspicuous, when examined under the lens, and the obovate-elliptic shape is shown by all the material.

Distrib.—FRANCE : nr. Montpellier, *Planchon* (1.5–2 mm.) ; St. Juilhen le Désert, *Moggridge, Planchon* (2–2.5 mm.) ; Mt. Alaric, Aude, *Durieu* (2 mm.) ; Mt. Alaric, *Burdigal* (2 mm.) ; Montpellier, *Delacour* (2–2.5 mm.) ; Carpaigne nr. Marseilles, *Billot* 3318 (2 mm.).

SPAIN : Almeria, Velez-Rubio, *Ellman and Sandwith* 960 (2 mm.) ; Serra de Baya, *Bourgeau* (2.25 mm.) ; Sierra de la Nieva, Ronda, *Hubbard*, 1182 (2 mm.) ; Sierra Tejeda, *Willkomm* 70 (2 mm.).

GREECE : Hymettus, *Heldreich* 823 (2 mm.).

ALBANIA : Gjinokastrë, Mali Lunxheriës range, *Alston and Sandwith* 2194 (2 mm.).

MACEDONIA : Athos, *Grisebach* (2.25 mm.).

ASIA MINOR : Lycia, Elmalu, *Bourgeau* (2 mm.).

Synonyms.

C. microcarpa Moris in Att. terz-riun. degli Scienz. Ital. 539 (1841).

C. gracilis Planch. in Bull. Soc. Bot. Fr. 5, 494 (1858).

C. Jonthlaspi L. var. *microcarpa* Arcang. Comp. fl. Ital. 63 (1882).

Jonthlaspi microcarpum Caruel Fl. Ital. 9, 1051 (1893).

C. Jonthlaspi L. subsp. *microcarpa* Murb. Contr. fl. nord-ouest Afr. 1, 11 (1897).

C. Jonthlaspi L. subsp. *Gaudinii* Fiori var. *microcarpa* (Moris) Fiori in Flor. Ital. Exsicc. 1278 (1910) et in Nuov. Giorn. Bot. Ital. N.S. 17, 611 (1910).

C. Jonthlaspi L. var. *Morisiana* Reyn. in Bull. Géogr. Bot. 21, 291 (1911).

C. Jonthlaspi L. var. *Rouxiana* Reynier in Bull. Géogr. Bot. 21, 291 (1911) ; *C. Sarrati* De Laremborgue ex Reynier l.c. (probably a depauperated subvariation with scarcely any wing to the fruit).

var. 10, formula : w G d G L.

Distrib.—FRANCE : Cult. Mentone, *Moggridge* (4.5 mm.) ; nr. Lyon, *Jordan* (4 mm.).

DALMATIA : Lesina, *Alexander Prior* (3–4 mm.).

ASIA MINOR : Smyrna, *Fleischer* (4 mm.).

IRAQ : Gorluk, *Chesney* 51 (3.5–4 mm.).

Synonyms.

C. Jonthlaspi L. var. *lejocarpa* Vis. Fl. Dalm. 3, 107 (1850), (or to var. 11).

C. psilocarpa Jord. et Fourr. Brev. Plant. Nov. 2, 14 (1868).

C. Jonthlaspi L. subsp. *macrocarpa* Fiori var. *psilocarpa* (Jord. et Fourr.) Fiori in Flor. ital. exsicc. 1278 (1910) et in Nuov. Giorn. Bot. Ital. N.S. 17, 610 (1910).

var. 11, formula : w G d G M.

Distrib.—BALEARICS : Majorca, *Velldenose, Edmonds* 164A, (3 mm.).

FRANCE : *Gonan* (3 mm.) ; nr. mouth of R. Adour, (2.5–2.75 mm.) ; nr. Toulon, *Bourgeau* 31 (3–3.25 mm.).

ITALY : Venice, nr. Brondolo, *Fiori and Béguinot* (3 mm.).

GREECE : Hymettus, *Heldreich* 823 (3 mm.).

MACEDONIA : N. of Salonika, *Asbestochoroi, Hill, Sandwith, Turrill* 2659 (2.75 mm.).

ASIA MINOR : Lycia, Elmalu, *Bourgeau* (3 mm.).

Synonym.

C. Jonthlaspi L. var. *leiocarpa* Gruner in Bull. Soc. Imp. Nat. Mosc. 40, pt. 2, 396 (1867). (or to var. 10).

var. 12, formula : w G d G S.

Distrib.—SPAIN : Murcia, *Cehegin, Gandoger* 372 (2.5 mm.).

GREECE : Corinth, *Atchley* 1625B. (2.5 mm.) ; Hymettus, *Heldreich* 823 (2.5 mm.).

Synonyms.

C. glabra Bois. in Ann. Sci. Nat. IIe Sér. 17, 173 (1842).

C. laevigata Jord. et Fourr. Brev. Plant. Nov. 2, 16 (1868).

Jonthlaspi clypeolatum Caruel var. *microcarpa* Caruel in Parlatore Flor. Ital. 9, 1050 (1893).

C. microcarpa Moris var. *glabra* Hal. Consp. Fl. Graec. 1, 117 (1900).

C. Jonthlaspi subsp. *Gaudinii* (Trachs.) Fiori var. *glabra* (Boiss.) Fiori in Flor. Ital. Exsicc. 1278 (1910) et Nuov. Giorn. Bot. Ital. N.S. 17, 611 (1910) e descr. p.p. (and p.p. var. 11).

C. Jonthlaspi L. var. *glabra* (Boiss.) Reynier in Bull. Géogr. Bot. 21, 290 (1911).

2. *C. elegans* Boiss. et Huet. in Boiss. Diagn. Ser. 2, V, 38 (1856).

An annual erect plant with slender much branched stems, about 2.8 dm. high. Stems terete, covered with closely adpressed, small, greyish white, stellate hairs, with rather long slender branches. Leaves linear to narrowly-oblongate, rarely broader, 3 mm. to 1.8 cm. long, 1.0–2.5 mm. broad, covered with stellate hairs, similar to or slightly more robust than those of the stem, on both surfaces, very dense on the lower, midrib (in dried material) slightly prominent.

on lower surface of older leaves. *Inflorescence* in the young condition very compact lengthening with age, axis with similar indumentum to that of the stem, ebracteate, ebracteolate; flower pedicels 2.5 mm. to 3 mm. long. *Sepals* oblong-elliptic, apex rounded, with a membranous margin, 1.75 mm. long, stellate hairs on outside only, persistent in young fruit then caducous. *Petals* spathulate to oblanceolate, 2.5 mm. long, glabrous. The four longer *stamens* 2.75 mm. long, filaments asymmetrically flat-winged along the whole or the major part of their length, in the lower half on the adaxial side the wing much broader and ending in an erect tooth about 0.4 mm. long, entire and acute or slightly emarginate. The two shorter *stamens* 1.25 mm. long, with a membranous appendage, flattened dorsiventrally, 1 mm. long, apex slightly emarginate. *Gynoecium* 1.25 mm. broad, 2.5 mm. long including style 1 mm. long; ovary suborbicular-elliptic, compressed, biconvex, the central region with an indumentum of very short hairs, little longer than papillae, the margin transparent, inflated and convolute. *Fruit* nearly orbicular, 3.25–3.75 mm. long and 3.25–3.75 mm. broad, compressed and slightly biconvex, the margin inflated, convolute, and glabrous, the disc thickly covered with straight, slightly clavate, smooth hairs; fruiting pedicels 3.5 mm. long. *Seed* compressed ellipsoid, 1.5 mm. long, 1 mm. broad.

ARMENIA: in montibus inter Erzeroum et Ispir: inter Zarbos et Ibaho, 920–1230 m., June 1853, *Huet du Pavillon*.

var. *laevigata* Chaytor et Turrill: a planta typica fructu omnino laevi, margine leviter convoluto distinguitur.

"Asia Minor": sine loc. *Zohrab*.

"Persia": sine loc. Major Willoch (Herb. Cantab.).

3. *C. ciliata* Boiss. Fl. Or. 1, 309 (1867).

An annual erect plant with slender, slightly branching stems, 1.8–2.9 dm. high. A nearly vertical, relatively simple taproot. *Stems* terete covered with closely adpressed small greyish-white stellate hairs with numerous short dichotomous branches. *Leaves* linear to oblanceolate-linear, subacute to obtuse, 3 mm. to 1.3 cm. long, 1–2 mm. broad, covered with stellate hairs, having longer branches than those of the stem, on both surfaces, more dense on the lower; midrib (in dried material) slightly prominent on lower surface. *Inflorescence* in the young condition very compact, lengthening with age, axis with similar indumentum to that of the stem, ebracteate, ebracteolate; flower pedicels 1.5–2 mm. long. *Sepals* ovate-elliptic, 1.75 mm. long, with stellate hairs on the outside only, membranous margin, persistent in very young fruit then caducous. *Petals* oblanceolate, slightly bilobed, 2 mm. long, glabrous, persistent in young fruit, then caducous. The four longer *stamens* 1.75–2 mm. long, the filament flatwinged on the adaxial side in the lower half, the wing ending in a narrow, erect, acute tooth about 0.5 mm. long, the distal region of the filament enlarged papillate. The two shorter *stamens* 1 mm. long, the filament

enlarged and papillate in the distal region, bearing adaxially at the base a membranous appendage flattened dorsiventrally, nearly 1 mm. long. *Gynoecium* 2 mm. long including style 0.75 mm. long, ovary compressed, orbicular, 1.25 mm. diam., covered with short, simple hairs, longer, denser and more slender at the margin. *Fruit* sub-orbicular-elliptic, 4.5 mm. long, 3.75–4 mm. broad, compressed, slightly biconvex, covered over the whole surface with long, simple, straight, smooth or very slightly asprous hairs tapering to a point and particularly dense at the margins, mixed with short capitate hairs; fruiting pedicels up to 3 mm. long. *Seed* elliptic, compressed, 1.75 mm. long, 1.25 mm. broad.

LYCIA: in saxosis regionis subalpinae montis Elmalu, 13.5.1860, *E. Bourgeau* 30; Cragus Mtns., end of May, 1843, *E. Forbes* (see Spratt and Forbes: Travels in Lycia 2, 148, 161: 1847).

4. *C. eriocarpa* Cav. Descr. de las Plantas, 401, 615 (1802).

An annual erect plant with simple or slightly branched stems, 5.5 cm. to 2.6 dm. high. A nearly vertical, relatively simple taproot. *Stems* terete, simple, slightly, or much branched, slender, covered with closely adpressed, small, greyish-white stellate hairs having numerous long dichotomous branches. *Leaves* linear to linear-oblanceolate, acute, narrowed below, 0.4 cm. to 1.7 cm. long, 1.0 mm. to 3.0 mm. broad, covered with compact much branched stellate hairs on both surfaces, very dense on the lower; midrib (in dried material) prominent below; in older plants as the fruit ripens most of the leaves drop off. *Inflorescence* in the young condition compact, lengthening with age, axis with similar indumentum to that of the stem, ebracteate, ebracteolate; flower pedicels 1.0–2.0 mm. long. *Sepals* elliptic, in young flower 2.75 mm. long, with stellate hairs on outside only, membranous margin, enlarging slightly in young fruit, persistent. *Petals* obovate-oblanceolate, 3 mm. long, bearing stellate hairs on outside only, persistent. The four longer *stamens* 2 mm. long, the lower two-thirds of the filaments asymmetrically flat-winged, in the lower half on the adaxial side the wing much broader and produced into an erect, acute to acuminate tooth, about 0.25–0.5 mm. long; the two shorter *stamens* 1.5 mm. long, bearing adaxially a membranous appendage about 1 mm. long, flattened dorsiventrally, bearing one minute tooth near the apex. *Gynoecium* 2 mm. long including style 0.5 mm. long, ovary orbicular, covered with a dense white indumentum, probably of stellate hairs. *Fruit* compressed, slightly biconvex, orbicular, 5.5–6 mm. broad, margin crenulate, densely covered with a white indumentum of very long fine hairs; these may be the lengthened arms of stellate hairs; fruiting pedicels up to 4 mm. long. *Seed* orbicular, compressed, biconvex, 1.5 mm. broad.

SPAIN: Castile: in collibus calcareis ad Aranjuez, 20.5.51, *J. Lange* in F. Schultz, Herb. norm. 213; Aranjuez, 5.1852, *Boissier*; in coll. prope Aranjuez, April, *Herb. Graelsianum*; Cerro de Aran-

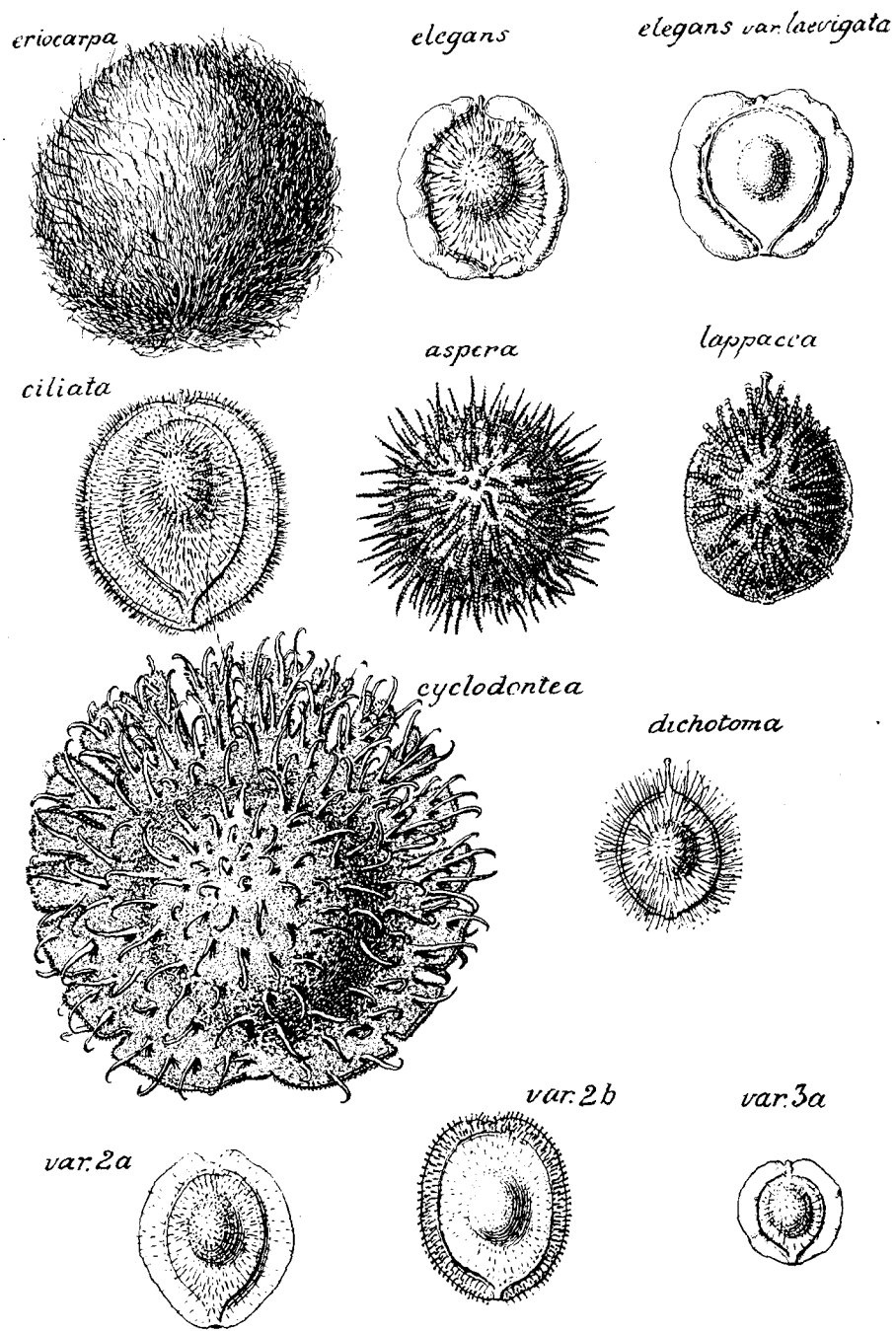


Fig. 2. Fruits of species of *Clypeola*. $\times 6\frac{2}{3}$. Top row—right hand figure (*C. elegans*) var. *laevigata*, shows fruit with style removed. Bottom row—fruits of *C. Jonthlaspi* variations.

juez, dans les paturages de *Stipa tenacissima*, 7.5.1854, E. Bourgeau 2092.

Granada : coteau arides a Cullar entre Baza et Huescar ou il croit en abondance avec le *Stipa tenacissima*, 26.5.1851, E. Bourgeau 1023.

Prov. d'Almeria : coteaux arides à Cullar entre Baza et Huescar, 26.5.1852, E. Bourgeau.

Synonyms.

Vesicaria lanuginosa Poir. in Lam. Encycl. 8, 573 (1808).

Alyssum lanuginosum Pourret ex Poir. l.c.

Alyssum eriophorum Pourret in Willd. Enum. 671 (1809).

Orium lanuginosum Desv. Journ. Bot. 3, 162 (1814).

Alyssum eriocarpum Poir. apud Desv. l.c.

Clypeola eriophora DC. Syst. 2, 327 (1821).

Alyssum eriocarpum Pourr. ex Steud. Nomencl. ed. 2, 67 (1840)

Clypeola eriocarpa Cav. ex Lag. in litt. sec. Del Amo, Flor. Fanerog. Esp. y Port. 6, 57 (1873).

Cavanilles in his Descr. de las Plantas 401, 615 (1802), does not appear to use a binomial for this species. His Latin reference to the plant is: "911. CLYPEOLA eriocarpa foliis sublinearibus incanis: siliculis lanatis." Apparently he always ran on from the name to the diagnosis without a stop.

5. *C. aspera* (Grauer) Turvill in Journ. Bot. 60, 269 (1922).

An annual erect plant with simple to much branched stems, 3 cm. to 2.1 dm. high. A nearly vertical almost simple taproot. Stems terete, covered with closely adpressed, small, greyish-white, long-branched stellate hairs. Leaves linear, spathulate to narrowly oblanceolate, acute, 3.0–0.4 cm. long, 3.5 to 1.0 mm. broad, covered on both surfaces with stellate hairs, more dense on the lower, the comparatively few, stellately arranged branches of the hairs dichotomously branched; midrib (in dried material) prominent on the lower surface; in older plants, as the fruits ripen, most of the leaves fall off. Inflorescence compact in the young condition, lengthening with age, axis with similar indumentum to that of the stem, ebracteate, ebracteolate; flower pedicels 1 mm. long. Sepals elliptic to elliptic-ovate, 2 mm. long, with stellate hairs on the outside only, membranous margin, persistent in very young fruit, then caducous. Petals spathulate, rounded to slightly emarginate, 2.5 mm. long, persistent in very young fruit then caducous, quite glabrous. The four longer stamens 2 mm. long, filaments asymmetrically flat winged, in the lower half on the adaxial side the wing much broader, ending in an erect acuminate tooth about 0.5 mm. long; the two shorter stamens 1.5 mm. long, bearing adaxially on the lower half of the filament a membranous appendage flattened dorsiventrally, more or less entire and sharply acute or with two erect acute teeth about 0.25 mm. long. Gynoecium 1.5 mm. long including style 0.5 mm. long; ovary suborbicular, compressed, covered with simple

rather broad capitate hairs which later lengthen and become barbed. *Fruit* compressed, slightly biconvex, ovate-orbicular, 3.5 mm. long, 3 mm. diam., with an irregularly crenulate margin, with 2 kinds of hairs, long hairs barbate-capitulate and with short reversed barbs throughout their length, short hairs barbate-capitulate; fruiting pedicels up to 3.5 mm. long, more or less curved (arched) downwards. *Seed* elliptic-orbicular, compressed, biconvex, 1.8 mm. long, 1.6 mm. broad.

TURKEY: in gramin. Nimrud Dag supra Orfa, 4.1867, *Hausknecht*.

SYRIA: Djebel Khairoun, nord de Damascus, 24.3.1876, *Gaillet* 1567.

PALESTINE: Tufila, *Roth*; 3 hrs. S.E. of Es Salt, 830 m., 29.4.1911, forest, *Myers et Dinsmore* M.572.

IRAQ: Kurdistan, *Olguin*; Mesopotamia, *Aucher-Eloy* 283; in desertis ad Kerkuk, c. 400 m., 26.4.1893, *Bornmüller* 898; near Chamchewal, 770 m., 6.4.1929, *F. A. Rogers* 0179A.

PERSIA: in glareosis faucium pr. Gere inter Abuschir et Schiras. 17.3.1842, *Kotschy* 63; pr. Sser-tschah, 3.1859, *Bunge*; in gramin. Kaserun, 4.1868, *Hausknecht*; unter d. ephemeren Vegetation d. Gypshügel v. Komaredsch, N. Seite, 4.5.85, *Stapf*; inter prov. Kerman: in collibus regionis calidae prope Kerman, c. 2000 m., 2.5.1892, *Bornmüller* 2193; Dehaneh Baghi, 26.4.1908, *W. E. James*.

BALUCHISTAN: Dorbund, 1851, *Stocks* 879; Quetta, 7.4.1888, *Duthie* 8601; Surkhab Valley, 1800 m., 28.4.1889, *Lace* 3734.

AFGHANISTAN: Chokey, *Griffith* 1514.

Synonyms.

Peltaria aspera Grauer, *Decuria* 6 (1784). This is based on *Jonthlaspi orientale fructu echinato* Tourn. Coroll. 14. Grauer's description is republished by Sprague in *Journ. Bot.* 60, 269 (1922).

Clypeola lasiocarpa Juss. ex Pers. Syn. 2, 193 (1805-07).

Bergeretia echinata Desv. *Journ. Bot.* 3, 162 t. 25, f. 9 (1814).

C. echinata DC. Syst. 2, 328 (1821) et Prodr. 1, 165 (1824).

C. chaetocarpa Jaub. et Spach, Ill. Pl. Or. 3, t. 206 (1847-50).

6. *C. lappacea* Boiss. in Ann. Sci. Nat. sér. II. 17, 174 (1842).

An annual erect plant with simple to much-branched stems, 4 cm. to 1.7 dm. high. A nearly vertical slightly branched tap-root. Stems terete, covered with closely adpressed small greyish-white, comparatively few-rayed, stellate hairs. Leaves long narrow oblanceolate to spatulate, acute to subacute, 4 mm. to 3 cm. long, 1 to 7 mm. broad, covered on both surfaces with stellate hairs similar to those of the stem, rather more dense on the lower; midrib (in dried material) prominent on the lower surface, often forming a furrow on the upper; in older plants as the fruit ripens, all the leaves fall off. Inflorescence compact in young condition, lengthening

with age, axis with similar indumentum to that of the stem, ebracteate, ebracteolate; flower pedicels 2 mm. to 3 mm. long. Sepals elliptic-ovate, 2.5 mm. long, membranous margin, stellate hairs on outer surface only, elongating to 3 mm. in young fruit, then caducous. Petals spatulate-oblongate, 3.75 mm. long, elongating to 4 mm. in young fruit, then caducous, glabrous. The four longer stamens 3 mm. long, filaments asymmetrically flat-winged, in the lower half on the adaxial side the winger much broader, ending in an erect acute tooth, 0.5-0.75 mm. long and very narrow or somewhat broader. The two shorter stamens 2 mm. long, asymmetrically flat winged as in the four larger, the tooth of the adaxial wing very narrow, acute, about 0.75 mm. long. Gynoecium 2.5 mm. long including style 1.5 mm. long; ovary elliptic, compressed, covered with a dense indumentum of short, stout, simple hairs. Fruit ovate-orbicular, compressed, biconvex, 5 mm. long, 4.5 mm. broad, pericarp coriaceous, margin not membranaceous, entire in the lower part with a few coarse teeth in the upper, covered with stiff bristles barbate-capitulate and with short reversed barbs throughout their length, in addition there are short hairs once or twice dichotomously forked at the apex, each fork finally ending in a sharp point; fruiting pedicels up to 4.5 mm. long, abruptly turned downwards, not curved. Seed nearly orbicular, 3 mm. diam.

SYRIA: sine loc. 1846, *Pinard*; Antilibanus, supra Rascheya, 6.1846, *E. Boissier*.

ARMENIA TURCICA: Kharput, Mezre, 8.5.1889, *P. Sintensis* 319.

TURKEY: Mardin, 1836, *Aucher-Eloy* 282; in gramin. pr. Mardin, 3.1867, *C. Hausknecht*.

IRAQ: in gramin. Djebel Taktak, 4.1867, *C. Hausknecht*.

PERSIA: inter Teheran et Tabris, 6.1859, *Bunge*; Urmia district, 5.1926, *B. Gilliat-Smith* 1565.

Synonym.

C. lasiocarpa Jaub. et Spach, Ill. Pl. Or. 3, t. 205 (1847-50) non Juss. [ex Pers. Syn. 2, 193 (1805-07) = *C. aspera*].

7. *C. Raddeana* Alb. in Bull. Herb. Boiss. 2, 448 (1894) et Bush in Flor. Cauc. Crit., Cruciferae, 615 (1910).

This species, of which we have seen no material, is apparently characterized especially by the absence of any wing to the silicles. It is recorded from "in aridis, saxosis siccis, decliv. siccis, lapidosis, detritu mobili Transcaucasiae occidentalis, in prov. Batum, distr. Artwin" (Bush, l.c.). The original description of Alboff's reads:

"Pumila tenuis gracilis, caule bifurco, siliculis orbiculatis emarginatis, stylo longiusculo (emarginatura majore) superatis; disco tuberculato margine viridi incrassato ala destituto. Adjarie: Artwin (Dr. Radde 1893. Exs. N.493)." The description given by Bush (l.c.) is rather more detailed and reads: "*C. Raddeana*

Alb. *gracilis*, caule tenui, ramoso 11-36 cm. alto; foliis oblongo-spathulatis, obtusis. *Sepalis* $1\frac{1}{4}$ - $1\frac{1}{2}$ mm. longis; *petalis* 2 mm. longis. *Pedunculis fructiferis* patentibus v. reflexis, *tenuissimis* $3-4\frac{1}{2}$ mm. longis; *siliculis suborbiculatis*, emarginatis, ca. $2\frac{1}{2}$ mm. longis, ca. 2 mm. latis, *disco tuberculato*, *marginine viridi glabro incrassato*, *ala destituto*; *stylo* 0.2-0.6 mm. longo, emarginaturam *siliculae* superante. ☉ v.s. in h. Th. Tm.

8. *C. cyclodonte* Delile in Bull. Soc. Agr. Hérault, 1830, 258.

An annual erect plant with simple to much branched stems, 3 cm. to 2.7 dm. high. A nearly vertical relatively simple taproot. *Stems* terete, covered with closely adpressed, small, greyish-white stellate hairs. *Leaves* spathulate-linear, oblanceolate to oblanceolate-elliptic, acute to subacute, narrowed below, 0.3 to 3.5 cm. long, 1.5 to 6 mm. broad, covered with stellate hairs on both surfaces, very dense on the lower, the stellately arranged branches of the hairs dichotomously branched; midrib (in dried material) prominent both above and below; in older plants as the fruits ripen most of the leaves fall off. *Inflorescence* in the young condition very compact, lengthening with age, axis with similar indumentum to that of the stem, ebracteate, ebracteolate; flower pedicels 1-1.5 mm. long. *Sepals* elliptic, in young flower 2.25 mm. long, with stellate hairs on the outside only, apices cucullate, with a membranous margin, enlarging in very young fruit to 2.5 mm. long and then caducous. *Petals* spathulate-oblanceolate, 2.5-2.75 mm. long, with a few stellate hairs on the outside only. The four longer *stamens* 2 mm. long, filaments asymmetrically flat-winged, in the lower half on the adaxial side the wing much broader and ending in an erect acute tooth about 0.3 mm. long; the two shorter *stamens* 1.75 mm. long with a membranous appendage arising from near the base and flattened dorsiventrally. *Gynoecium* 1.75 mm. long including a very short style; ovary suborbicular, compressed, covered with a dense stellate indumentum, the margin early becoming crenulate. *Fruit* orbicular, up to 9 mm. diam., with a deeply notched margin covered with two distinct kinds of hairs, the one kind stellate and short, the other longer, hooked and spreading; fruiting pedicels up to 4 mm. long; straight, deflexed and forming on an average an angle of about 45° with the rhachis. *Seed* orbicular, compressed, 2.5 mm. diam.

S. FRANCE: Port Juvenal, 1831 and 1833, Delile (alien).

ALGERIA: lieux arides entre les touffes d'alfa pres de Timetlas sur les Hauts-plateaux, cercle de Saïda 23.5.52 Balansa 537 et 25.5.1852, E. Cosson; Gharrouban, Tlemcen, en face de la maison Diaz, 5.1855, Munby; plaines cultivées a Batna, 4.5.1856, Henon et Lefranc 105; environs de Djelfa, 4.1857, Reboud 105 bis; province de Constantine, 27.3.58, E. Cosson; Géryville, in collibus, 25.3.67, A. Warion; fentes des rochers a le May (Sahara oranais) 5.5.1868, A. Warion; in vervactis, ad margines agrorum circa Sidi-Bel-Abbès, prov. Oran, 21.4.1874, A. Warion.

9. *C. dichotoma* Boiss. in Ann. Sci. Nat. Sér. II. 17, 175 (1842).

An annual erect plant with much branched stems, 2 cm. to 1.2 dm. high. Habit very characteristic, with usually numerous widely spreading branches, of which the lower are longer and give a corymbose appearance to the whole plant, or simple below, much branched above forming a compact cluster. A nearly vertical relatively simple taproot. *Stems* terete, covered with small, closely adpressed, greyish white, stellate hairs whose numerous slender branches are dichotomously branched. *Leaves* more or less opposite, broadly elliptic or obovate to spathulate-oblanceolate, subacute to obtuse, older leaves more or less narrowed below into short petiole, 4 mm. to 1.1 cm. long, 1.5 mm. to 1.1 cm. broad, more or less densely covered with stellate hairs on both surfaces, more dense on the lower; in dried material, midrib and two to four lateral veins, arising near the base, prominent on lower surface; leaves crowded at periphery of plant, absent from older parts. *Inflorescence* a comparatively lax spike lengthening slightly with age, axis with similar indumentum to that of the stem, situated at apex of stem exposing the flowers, subsequently hidden by upward growth of lateral branches arising near base of axis, ebracteate, ebracteolate, flower pedicels 1-2 mm. long. *Sepals* few stellate hairs on outside only, the two outer obovate, rounded cucullate, 1.5 mm. long, 1.25 mm. broad, the two inner oblong-oblanceolate, obtuse, 1.75 mm. long, 0.75 mm. broad, caducous in young fruit. *Petals* spathulate oblong to linear, 1.75 mm. long, 0.6 mm. broad, glabrous, caducous in young fruit. The four longer *stamens* 1-1.4 mm. long, filaments asymmetrically flat-winged, in the lower half on the adaxial side the wing much broader, ending in an erect subacute tooth, less than 0.5 mm. long; the two shorter *stamens* 1-1.2 mm. long, bearing adaxially on the lower half of the filament a membranous appendage flattened dorsiventrally, entire and subacute, 0.6 mm. long. *Gynoecium* 1.5 mm. long including more or less capitate stigma and style 1 mm. long; ovary compressed-ovoid, apparently glabrous. *Fruit* forming infructescences overtopped by younger branches, biconvex, elliptic-ovate in outline, 3-3.5 mm. long, 2-2.75 mm. broad, margin entire, covered with spreading clavate asprous hairs; fruiting pedicels about 4 mm. long. *Seed* elliptic-ovate, compressed, biconvex, 1.75 mm. long, 1.4 mm. broad.

ARMENIA: Szovits 281 in Herb. Kew.; according to Boissier (Flor. Or. 1, 310; 1867) Szovits's material was collected "in aridis salsis Armeniae ad Nackitchewan et Schabauli"; prov. Erivan, prope Nachitshevan, in collibus siccis, 11.5.1923, Grossheim 65.

PERSIA: Azerbaidjan, Aucher-Eloy 4082; inter Jesd et Isfahan, Maj. 1859, Bunge; Mähron, prov. Hamadan, 12.5.1884, Pichler; Zendgre in apricis, 21.5.1884, J. A. Knapp; Khoi in lapidosis, 27.5.1884, J. A. Knapp.

AFGHANISTAN: Hari-rud valley, 19, 27.4.1885, Aitchison 1155.

Synonym.

C. minima Stapf in Denkschr. Acad. Wien **51**, 303 (1886)—a depauperated form.

DISCUSSION.

The taxonomic units which we have here regarded as species are morphologically clearly separable one from another. Boissier (Fl. Or. **1**, 308 seq.: 1867) classifies the Oriental species accepted by him under three sections: 1. *Jonthlaspi* DC. (*C. Jonthlaspi*, *C. microcarpa*, *C. elegans*, *C. ciliata*), 2. *Bergeretia* DC. (*C. echinata*, *C. lappacea*), 3. *Pseudoanastatica* (*C. dichotoma*). This classification undoubtedly serves to emphasize the facts that *C. dichotoma* is markedly distinct in its peculiar habit of growth from the other species, that *C. echinata* and *C. lappacea* are closely related, and that *C. elegans* is more closely related to *C. Jonthlaspi* (in which we include *C. microcarpa*) than it is to any other species.

The species other than *C. Jonthlaspi* may first be considered.

C. elegans has apparently a very limited distribution in Armenia (and perhaps neighbouring areas). Its peculiar inflated convolute margin distinguishes it from all the variations of *C. Jonthlaspi*. It is, however, very interesting to note that a parallel variation with *C. Jonthlaspi* occurs in fruit indumentum. *C. elegans typica* would compare with *C. Jonthlaspi* var. 7 (of which, however, no material has been seen) or var. 8. *C. elegans* var. *laevigata* parallels *C. Jonthlaspi* var. 10 or var. 11. *C. ciliata* is only known from Lycia. Its fruits are covered over the whole surface with a mixture of two kinds of hairs.

C. eriocarpa is endemic in Spain. Its silicles up to 6 mm. diam. are exceeded in size only by those of *C. cyclodonteia*.

C. aspera and *C. lappacea* are rather closely related morphologically and their geographical distribution overlaps rather considerably. Both occur over a fairly wide area in the Orient. A number of differential characters appear, however, to be constantly correlated—the size of the flower, the length of the styles, and the angle of the fruiting pedicels. We have, therefore, thought it advisable to keep them distinct.

No material of *C. Raddeana* has been available for study. The published descriptions are somewhat meagre and the species remains doubtful. It is, *e descriptione*, especially characterized by the absence of a wing to the silicles and a tubercled disc. It is only known from the Batum district of Transcaucasia.

C. cyclodonteia is a North African species which was originally described as an alien from Port Juvenal, near Montpellier. This species has larger fruits than any other member of the genus.

C. dichotoma has a distribution extending from Armenia through Persia to Afghanistan. The species shows a wide range in size, probably depending mainly on the most local habitat conditions.

When well developed the plants have a peculiar habit owing to the relatively considerable branching with the branches widely spreading. The infructescences are overtopped by the growth of younger branches and the fruits ripen relatively low down amongst the branches. In addition very small depauperated forms occur (*C. minima* Stapf).

It is certain that the species as accepted above are relatively clear-cut morphologically—decidedly more so than are the variations we place under *C. Jonthlaspi*. There is no evidence of their crossing together or with *C. Jonthlaspi* even when distributional areas overlap.

The most difficult species taxonomically, but the most interesting, is *C. Jonthlaspi* which is by far the most polymorphic and has the widest geographical range. Most of what we have considered variants within the one species have by one or more authors been given binomials. Our reasons for considering them as variants of *C. Jonthlaspi* rather than as distinct species are:

1. The morphological characters recorded in our formulae are the best diagnostic ones we could find but they not infrequently show intermediate degrees of development. This is particularly true as regards size of fruit. The limitations of the three groups of classes based on fruit size (L, M, S) are largely arbitrary in the sense that a series of specimens showing almost continuous gradation in fruit size could be selected. Intermediate states of indumentum development also occur.

2. The morphological characters formulated occur in all possible 12 combinations (except that var. 7, w G d H L, has not been seen). This strongly suggests the interaction of a number of Mendelian factors differently combined as a result, partly, at least, of some hybridization and segregation.

3. On the whole the variants show no isolation. In geographical distribution there is general overlapping and often a wide distribution more or less throughout the species area. Apparent discontinuity in distribution of any given variant may be due merely to insufficient collecting in intermediate areas. Ecologically the variants grow under similar conditions and at similar altitudes. Indeed, field studies in South Macedonia have shown that several variants frequently grow in mixed populations. The mixed collections frequently seen in herbaria point to the common and widespread occurrence of similar mixed populations.

Two variants require special mention. Var. 9 [var. *microcarpa* (Moris) Arcang. s.s.] is the most distinct and uniform in the expression of its formulated characters of all the variants. Not only is the indumentum of the fruit (w G d H) developed in a very constant degree, the wings quite glabrous, and the disc covered with dense short white hairs, but the fruit shape and size show small ranges.

Under var. 3 (with the general formula w H d H S) we have placed specimens, from the Gavarnie district, French Pyrenees,

which have been named *C. pyrenaica*. They are samples of what the available evidence indicates is a very isolated population. The specimens are morphologically similar in having very small fruits but there is some variation in indumentum development and technically some individuals should be placed under var. 9 (w G d H S), but they have not the dense white disc indumentum of all our quoted specimens of this variant.

It would seem that within *C. Jonthlaspi*, as here accepted, we have a polymorphic species, consisting of a large number of variants. These are partly combinations of characters having more or less simple genic bases. Probably self-pollination is common, if not the rule, but crossing between variants no doubt occurs at times. It is hoped to test these matters experimentally in the near future. It is suggested that at least three gene pairs are necessary to explain the indumentum characters of the fruit. Fruit size (usually showing a high degree of correlation with plant size) is also dependent to a certain extent on genetic constitution. Possibly a number of multiple allelomorphs are concerned some of which may also slightly modify fruit shape.

On the other hand, the var. 9 with its very clear cut expression of fruit characters is at least an incipient morphological species. Similarly the Gavarnie population (under var. 3) indicates a possible stage in the reduction and divergence of variation of an isolated portion of a species population and may represent a species in the making.

In attempting to place published names under one or other of our accepted variants of *C. Jonthlaspi* we have done the best we could with imperfect descriptions most of which have no definitely cited type associated with them. It is impossible to be quite certain of the correct placing of several of the synonyms.

II.—STUDIES IN THE ERICALES: I. NEW AND LESS-KNOWN SPECIES OF AGAPETES. H. K. AIRY-SHAW.

The most important contribution to our knowledge of *Agapetes* since the account by C. B. Clarke in the Flora of British India, 3 (1881-82), is the paper by W. E. Evans in the Notes from the Royal Botanic Gardens, Edinburgh, 15, 199-208, tt. ccxix-ccxxi (1927). This paper was based principally upon the copious material collected by the late George Forrest. It is the purpose of the present paper to elucidate in a similar manner the material brought back by Capt. F. Kingdon Ward from Upper Burma and Assam in the course of the last decade, which has contained a remarkable number of new and interesting species of *Agapetes* and allied genera. Descriptions of or notes on certain other new or misunderstood species have been included, principally from the material in the Kew Herbarium, where all the specimens cited are preserved unless otherwise stated.

The separation of the genus *Agapetes* from *Vaccinium* Sect. *Epigynium* is probably an artificial one, but for practical purposes it is here maintained, pending a revision of the entire *Vaccinioideae*. The genus, such as it is, may be divided into three main groups, which do not appear to merit higher rank than that of Series. These groups, which are probably natural, are not susceptible of concise definition: for the practical work of identification, therefore, the artificial arrangements of C. B. Clarke and of Brandis may be found of greater use. As so often happens, a "natural" (or phylogenetic) arrangement, according to probable lines of descent, is incompatible with a "practical" arrangement by means of single, easily observed characters. It is the difference between "vertical" and "horizontal" classification: the latter is often more useful for practical purposes, but the former of greater value from a theoretical standpoint.

The following is an attempt at a diagnosis of the three series.

Series i. **Robustae** *Airy-Shaw*, ser. nov. Caules ramique plus minus robusti et rigidi; folia inter maiora, saepe ampla, saepe pseudo-verticillata; inflorescentiae racemosae, corymbosae vel fasciculatae; filamenta brevissima.—Typus, *A. setigera* D. Don.

Series ii. **Graciles** *Airy-Shaw*, ser. nov. Caules ramique plus minus graciles et flexuosi, saepe scandentes; folia nunquam pseudo-verticillata, saepe angusta vel inter minora, saepe discoloria; inflorescentiae corymbosae, rarissime fasciculatae, pedunculo saepe elongato; filamenta brevissima; antherae dorso ecalcaratae.—Typus, *A. linearifolia* C. B. Clarke.

Series iii. **Longifiles** *Airy-Shaw*, ser. nov. Caules ramique inter graciliores, sed raro scandentes; folia plerumque parva, rarius inter maiora; inflorescentiae plerumque fasciculatae, saepe uniflorae, raro racemosae vel corymbosae; filamenta elongata, antheris longiora vel saltem iis aequilonga, rarissime breviora.—Typus, *A. Kanjilali* A. Das.

Series i is represented in the "Flora of British India" by Clarke's Sections I and II, as well as species 19 and 20 of Sect. IV, and species 24 (Sect. V). I consider that there are insufficient grounds, in view of the polymorphism of *Agapetes*, for maintaining *A. acuminata* (Wall.) D. Don as a distinct genus (*Corallobotrys* Hook. fil.); it should be included in Series *Robustae* as a *species anomala*. I have not attempted to construct a key to this Series, as it still requires much critical study.

Series ii includes species 18 (Sect. III) and 25 and 26 ("imperfectly known") of the "Flora of British India"; the genus *Desmogyne* King et Prain; and five other species, including two described here as new. The group is found in the mountains surrounding the Brahmaputra valley in north-eastern Assam, i.e., the Daphlas, Abors, Mishmis, and Patkois, extending also eastwards into western Yunnan and southwards at least to Bhamo in Upper

Burma. No species are known from the Khasia Hills or from Lower Burma. A key to all the species referred to this group will be found on p. 38, *infra*.

Series iii includes, from the "Flora of British India," species 16 and 17 (Sect. III) and 21 and 22 (Sect. IV). Also referable here is *Agapetes Pottingeri* Prain, the type of the same author's Sect. *Holocalyx*. In addition to several species published since the "Flora of British India," four are described here for the first time. The outstanding characteristic of the species of this group is the elongation of the filaments: only in *A. bracteata* Hook. fil. (and the anomalous *A. pilifera* Hook. fil. and *A. obovata* (Wight) Hook. fil.) are they almost as short as in the majority of the genus. In all except *A. bracteata*, *A. Pottingeri*, and *A. adenobotrys* Airy-Shaw the peduncle of the inflorescence is completely suppressed. A key to the group is supplied on p. 44, *infra*.

I have decided to include the very anomalous *A. pilifera* and *A. obovata* in this Series, as *species anomala*e, rather than establish separate series for their reception, only after much deliberation and hesitation. *A. pilifera* appears to be related to *A. bracteata* Hook. fil. and possibly even to *Vaccinium Dunalianum* Wight, whilst *A. obovata* has probably arisen from the same stock as *A. Mannii* Hemsl.

All species of *Agapetes* described since the "Flora of British India" and not enumerated in the keys to Series ii or iii (*infra*) are referable to Series i, with the exception of *A. manipurensis* Watt ex Brandis (Ind. Trees, 405: 1906), *A. parviflora* Dunn and *A. vaccinioides** Dunn: these are all species of *Vaccinium*, the first-named being allied to *V. retusum* (Griff.) Hook. fil. ex C. B. Cl., while the last two are near *V. Dunalianum* Wight and *V. arbutoides* C. B. Cl. Closely allied to the latter also are the four species from the Malay Peninsula referred to *Agapetes* by Ridley (Fl. Mal. Penins. 2, 205: 1923; 5, 318: 1925). All other species from the Malay Islands and from Australia are referable either to *Vaccinium* or to *Dimorphanthera*.

Series i. ROBUSTAE.

Agapetes macrophylla C. B. Clarke in Hook. fil. Fl. Brit. Ind. 3, 445 (1881); Brandis, Ind. Trees, 404 (1906).

ASSAM. Chibaon, Delei valley, 28° 10' N., 96° 30' E., 1800 m., 8 Apr. 1928, *F. Kingdon Ward* 8032: "A small or straggling epiphytic shrub of the temperate rain-forest. Remarkable for the large size of the leaves. The flowers are borne on pendent bunches from the old wood. Corolla green with zig-zag crimson markings, translucent. Calyx and ovary bright red."

* *A. vaccinoidea* Lévl., which antedates Dunn's species by about six months, is referred by Rehder (in Journ. Arn. Arb. 15, 288: 1934) to *Vaccinium japonicum* var. *sinicum* (Nakai) Rehd.

A magnificent species, hitherto known only from the type-specimens collected by Griffith in the Khasia hills. The leaves, easily the largest in the genus, in Kingdon Ward's specimens are rounded to truncate or very slightly cordate at the base, and measure up to 30 cm. in length and 13.5 cm. in width. The calyx-teeth are somewhat shorter and broader than in the type. The specimens agree, however, so well in all main characters that there seems no justification for separating them even varietally on present evidence.

Agapetes burmanica W. E. Evans in Notes Roy. Bot. Gard. Edinb. 15, 199, t. ccxix (1927).

ASSAM. Delei valley, 28° 17' N., 96° 35' E., 900–1200 m., 23 Apr. 1928, *F. Kingdon Ward* 8124: "A big straggling shrub with long loose branches, forming confused tangles on a precipitous wooded cliff; rarely more or less erect and then probably soon flopping over. Not epiphytic. Flowers pendent singly or in bunches from the old wood, sometimes from the extreme base of the stem, so that they touch the ground. Corolla 2–2½ in. long, bright rose-crimson for ¾ of its length with darker veining, apple-green towards the apex, including the long narrow teeth, which curve outwards, and barred with crimson."

As pointed out by Evans (*l.c.* 200), this species resembles *A. grandiflora* Hook. f. in floral characters and *A. auriculata* (Griff.) Hook. f. in foliage, differing from both in the large calyx-segments. In this latter character, however, it agrees with *A. sikkimensis* Airy-Shaw (described below, p. 29), which is undoubtedly a close ally of *A. auriculata*. *A. burmanica* thus forms a link between these species and *A. grandiflora*.

The following species of this series are all distinguished by elongate calyx-segments, but it would be unsafe to conclude, on the basis of this one character alone, that they are all necessarily closely related: *A. miniata* (Griff.) Hook. f.; *A. macrophylla* C. B. Cl.; *A. sikkimensis* Airy-Shaw; *A. burmanica* W. E. Evans; *A. megacarpa* W. W. Sm.; *A. Hillii* Brandis (Ind. Trees, 404: 1906; type, *Montague Hill* 112, in Herb. Kew.); *A. marginata* Dunn. Compare also *A. setigera* var. *macrosepala* Airy-Shaw (p. 34, *infra*).

Agapetes pubiflora Airy-Shaw, sp. nov. habitu *A. macrophyllae* C. B. Cl. subsimilis, sed foliis nervo marginali distinctissimo praeditis, venulis valde obscuris nec pulchre reticulatis, corymbis puberulis brevissime pedunculatis, calycis segmentis breviter deltoideis acuminatis, antheris dorso calcaratis abunde discrepat; *A. glabrae* (Griff.) C. B. Cl. et *A. sikkimensi* Airy-Shaw, pariter floribus puberulis gaudentibus, revera affinis, a priore corymbo brevissime pedunculato, a posteriore calycis segmentis breviter deltoideis, ab utraque foliis haud pseudo-verticillatis amplioribus basi in petiolum brevem angustatis, corolla dimidio longiore, antheris dorso

calcaratis, stigmatе parvo itaque corollae lobis apice haud cucullatis bene distincta.

Frutex epiphyticus, ramis robustis usque 8 mm. diametro leviter anfractuosus obtuse grosse angulatus glabris laevibus. *Folia* alterna, haud verticillata, ut videtur plus minus disticha, ampla, ovato-oblonga usque obovato-oblonga, rarius ovata vel elliptica, 13.5–22.5 cm. longa, 6–10 cm. lata, basi cuneata usque subrotundata, apice breviter vel brevissime acuminata, acuta, margine remote undulato-crenata, dentibus obscuris hydathodiiformibus vix prominulis saepe indentatis, glandula vel hydathodio ima basi laminae utrinque singulo conspicuo, sat coriacea, glaberrima, costa valida infra prominente basi 3–4 mm. crassa, nervis lateralibus utrinque 15–25 adscendentibus fere rectis parallelis subtus elevatis cum nervo conspicuo marginali tandem anastomosantibus, venulis plerumque obscuris; petiolus crassus, fuscus, 5–10 mm. longus. *Corymbi* e ramis vetustioribus orti, subfasciculiformes, toti puberuli: pedunculi abbreviati, usque 1 cm. longi, singuli vel nonnunquam bini ut videtur ex eadem axilla, basi perulis parvis triangularibus fimbriatis suffulti, bracteis pedicellos suffulcientibus lanceolatis 3–4 mm. longis plerisque delapsis; pedicelli 1.8–2.5 cm. longi, subcarnosi, sursum incrassati, cupula apicali vix evoluta, ima basi bracteolis 2 plus minus persistentibus bracteis similibus sed minoribus instructi. *Calyx* totus 5–6 mm. longus: receptaculum basi truncatum, 2 mm. longum; calycis limbus 3–4 mm. longus; segmenta ovato-triangularia, breviter acuminata, acuta, carinata, basi breviter connata. *Corolla* subcylindrica, basin versus levissime angustata, circiter 2.8 cm. longa (inclusis segmentis triangularibus 4 mm. longis acuminatis acutis apice reflexis), basi 4 mm. usque fauce 8 mm. diametro, quam pedicellus et calyx subtilius densiusque puberula, subcarinato-pentagona. *Stamina* tota circiter 2.8 cm. longa: filamenta applanata, 3 mm. longa, superne subsericeo-pubescentia; antherae 2.6 cm. longae, parte pollinifera scabrido-papillosa ipsa basi breviter obtuse uncinato-incurva et fere verruculoso-scabra, rostris omnium antherarum conniventibus et leviter cohaerentibus, cuiusque antherae omnino connatis laevibus, antherarum alternarum circiter 9 mm. et 11 mm. infra apicem bicalcaratis, calcaribus circiter 1.5 mm. longis alternatim aut ambabus deflexis rostro arcte adpressis aut altera descendente recta altera adscendente recurva. *Stylus* gracilis, glaber, circiter 2.8 cm. longus, stigmatе parvo vix expanso. *Fructus* ignotus.

UPPER BURMA. Valley of the Nam Tamai, 900 m., 10 Jan. 1931, *F. Kingdon Ward* 9118 (type, Herb. Mus. Brit.): "One of the commonest epiphytic species hereabouts; present on almost every big tree, flowering freely. Flowers crimson with green teeth."

S. E. TIBET. Lat. 28° 25' N., long. 97° 55' E., 1200–1500 m., 22 Nov. 1931, *F. Kingdon Ward* 10,168 (Herb. Mus. Brit.): "A common epiphytic shrub, now in full bloom in the forest. Especially abundant along the rocky bank of the river."

Evidently allied to the *auriculata-glabra-sikkimensis* group, but very distinct in its petiolate, non-verticillate leaves, larger corolla and spurred anthers.

Agapetes sikkimensis *Airy-Shaw*, sp. nov. *A. auriculatae* (Griff.) Hook. fil. peraffinis, quoad folia vix ab ea distinguenda, sed inflorescentiis subsessilibus pubescentibus e ramis vetustioribus ortis, calycis segmentis subduplo longioribus latioribusque basi contiguis sinubus acutissimis nec rotundato-truncatis seiunctis, fructibus subduplo maioribus satis recedit.

Agapetes auriculata C. B. Cl. in Hook. fil. Fl. Brit. Ind. 3, 444 (1881), *pro parte*, quoad specimen Hookerianum Sikkimense, et fructus descriptionem; Brandis, Ind. Trees, 405 (1906), *pro parte*, quoad "Sikkim" et "corymbs from the old wood" et fruct. descr.; non Hook. fil.

Frutex epiphyticus, ramis robustis ut videtur parum ramosis, cortice fusco varie striato et lenticelloso. *Folia* ea *A. auriculatae* ita simulantia ut distinctionem aegre facias, sed utraque pagina obscuriora, id est minus nitida, et forsan paullulo crassius coriacea, interdum angustissime lanceolata (usque 21 cm. longa et 4–5 cm. lata). *Inflorescentiae* abbreviatae, fasciculiformes, totae subtilissime puberulae, plerumque supra cicatrices foliorum delapsorum pseudo-verticillatorum sed non raro etiam procul a foliis vel eorum cicatricibus e ramis vetustioribus ortae, nunquam ut videtur e pseudo-verticillo foliorum hornotinorum terminales; rhachis interdum usque 5–6 mm. evoluta, valde incrassata, sed plerumque omnino suppressa; bractae bracteolaeque parvae, deltoideae; pedicelli sub anthesi 5–9 mm. longi, apice in cupulam 2 mm. latam expansi. *Calyx* (incluso receptaculo) 9–10 mm. longus, puberulus, basi truncatus et acute pentagonus ibique circiter 2 mm. latus; segmenta fere libera, lanceolata, 7–8 mm. longa, circiter 2.5 mm. lata, acuta, conspicue subparallelo-nervosa, basi contigua, sinubus acutissimis in plicas parvas 5 subprominentes abeuntibus. *Corolla* anguste cylindrica, sursum leviter angustata, 1.5–1.8 cm. longa, prominenter 5-angulata vel fere 5-carinata, puberula; lobi lineares usque subspathulati, acuti, circiter 3 mm. longi, in alabastro primae anthesi erecti apice cucullati. *Filamenta* applanata, inferne leviter angustata, 2 mm. longa, glabra; antherae 1.5 cm. longae, parte pollinifera 4–5 mm. longa papillosa, rostris laevibus apice liberis. *Stylus* gracilis, corollam aequans, glaber, stigmatе maiusculo capitato. *Fructus* (iam a C. B. Clarke l.c. descriptus) ovoideus, 6–7 mm. longus et fere aequilatus, subexsuccus, ruber, puberulus; calycis segmenta persistentia, conico-conniventia, puberula, plicis 5 ad basin sinuum prominentibus plus minus decurrentibus; pedicelli usque 1.5 cm. longi, cupulo usque 5 mm. lato.

SIKKIM. Teesta, 1200 m., 7 and 13 May 18—, *J. D. Hooker* (Herb. Kew.): "Epiphytic. Calyx and fruit red." Teesta, 1200 m., 12 Nov. 1870, *C. B. Clarke* 13,865b (type, Herb. Kew.). Yankeung, 900 m., 28 Apr. 1876, *C. B. Clarke* 27,668 A and C (Herb. Kew.).

This is the only species of the genus so far known from Sikkim. The leaves so exactly imitate those of *A. auriculata* (Griff.) Hook. fil. that Clarke's failure to distinguish the two species is almost pardonable. In *A. auriculata*, however, they are distinctly glossier on both surfaces, and somewhat thinner in texture, while those of *A. sikkimensis* are on the whole slightly narrower in proportion to their breadth and more gradually narrowed to the apex. Clarke was, of course, mistaken in giving the length of the peduncle of *A. auriculata* as " $\frac{1}{4}$ – $1\frac{1}{2}$ in.," since only the longer measurement is applicable to that species, the peduncle in *A. sikkimensis* being rarely developed at all. The inflorescence is finely pubescent throughout in the present species, even to the mature fruiting stage; that of *A. auriculata* is glabrous *ab initio*. The calyx segments are strikingly dissimilar in the two species: those of *A. sikkimensis* are lanceolate, contiguous at the base where they are pinched into small sharp projecting folds at the base of the acute sinuses; in *A. auriculata* they are much smaller, narrowly subulate, and distinctly separated at the base by rounded or truncate sinuses.

All the specimens cited above are in fruit, except Clarke 13,685B, which has accordingly been chosen as the type. Although Clarke presumably based his remark "corolla tube . . . pubescent without at least when young" upon this specimen, he omitted to cite it, or any of his own collections, under *A. auriculata* in the "Flora of British India."

Both *A. auriculata* and *A. sikkimensis* are closely allied to *A. glabra* (Griff.) C. B. Clarke, which may be known by its long-peduncled, pubescent inflorescences, shorter calyx-segments and generally smaller leaves.

Agapetes angulata (Griff.) Hook. fil. in Benth. et Hook. fil. Gen. Pl. 2, 571 (1876); C. B. Clarke in Hook. fil. Fl. Brit. Ind. 3, 447 (1881); Brandis, Ind. Trees, 405 (1906).

UPPER BURMA. Nam Tamai valley, 1200–1500 m., 22 Jan. 1931, F. Kingdon Ward 9153 (Herb. Mus. Brit.): "A small straggling shrub in the open forest. Flowers red, with green teeth, scarcely open."

An uncommon species, hitherto known only from Griffith's collection from the Patkoi hills. The rather thin, distantly and shallowly dentate leaves are practically indistinguishable from those of *A. acuminata* (Wall.) D. Don (*Corallobotrys acuminata* C.B.Cl.). [There seem to be no sufficient grounds for maintaining the latter as a distinct genus]. I cannot, however, agree with Clarke that the "leaves, inflorescence and corolla" are "undistinguishable" from those of *A. variegata* (Wall.) D. Don: the leaves, at least, of the latter are readily distinguishable by their much more firmly coriaceous texture, less conspicuously dentate margin and often almost shining upper surface. Clarke, however, included *A. pulcherrima* (Wall.) Hook. f. under *A. variegata*: in that species the leaves are very similar in texture to those of *A. angulata* and probably Clarke

had these before him when stating that he was unable to distinguish the two.

Agapetes Parishii C. B. Clarke in Hook. fil. Fl. Brit. Ind. 3, 445 (1881); Brandis, Ind. Trees, 404 (1906).

ASSAM. Cachar, "Shapone Kookee poonjee," 19 Mar. 1873, Ramdane ex R. L. Keenan (Herb. Kew.; determined by C. B. Clarke as *A. setigera* D. Don). Kohima, Naga Hills, 25° 40' N., 94° 10' E., 1500 m., 10 Jan. 1928, F. Kingdon Ward 7791: "A small erect epiphytic shrub, in bud only. In jungle."

UPPER BURMA. SOUTHERN SHAN STATES: Toungyi, 1800 m., Feb. 1888, H. Collett 96. In fairly dry oak forest, between Lwemaung and Maungla, 1500 m., Jan. 1910, W. A. Robertson 91: "3–4 ft. high; corolla ridged with white." Lakut to Molye, 1500 m., Feb. 1910, W. A. Robertson 91A. KARENNI: Nat-toung, 1867, Rev. C. Parish (lectotype, Herb. Kew.).

LOWER BURMA. Sandoway Distr.: Gwa chaung, at sea level, 7 Mar. 1929, C. E. Parkinson 8835: "Epiphytic shrub, found on *Excoecaria agallocha*, with swollen spindle-shaped stems. Fls. scarlet. Beaks of anthers spurred." Salwin Distr.: Yemukyo, 1825 m., 3 May 1929, Po Chin 10,208: "Small bushy evergreen tree in rocky evergreen hill, 8 ft. high, 3 in. in girth. Fr. glabrous, globular, enclosed in persistent 5-cleft calyx, ∞ -seeded; seeds arranged in circular ring, tiny. Fruit-stalk red, thicker at point of attachment to fruit, ramal, single to a cluster of 2–4. Bark smooth, greyish, thin, $\frac{1}{8}$ ". Blaze brownish red. Wood whitish, tough." Amherst Distr.: Thoung gyne, Moolmein, 1500 m., 1857, T. Lobb (paratype, Herb. Kew.). Spur to Mulayit, Dawna Range, 600–1800 m., 25 Jan. 1912, J. H. Lace 5609 and 5614. Ibid., Apr. 1927, Shwe Nyau Tha 12. Ibid., 1200 m., 1 Feb. 1927, C. E. Parkinson 5115: "Epiphytic. Flowers deep red." Ibid., just below peak, 1890 m., 3 Feb. 1929, C. E. Parkinson 5133: "Epiphytic shrub. Flowers deep red." Mergui Distr.: Ngawun reserve, 12 Feb. 1927, R. N. Parker 2585: "Epiphyte with very swollen roots. Flowers pink with darker veins."

At the time of its description in the "Flora of British India" this species was known only from the collections of Parish from the Karen country and of Lobb from Lower Burma. The specimens enumerated above thus extend its known distribution not only into the extreme south of Lower Burma (Mergui) but also into the Shan States and Assam, showing it to be one of the most widespread species of the genus. Its altitudinal distribution is not less remarkable, ranging from sea-level (Sandoway) to close on 1900 m. on the peak of Mulayit (Amherst). It is also noteworthy that, despite the extent of its latitudinal and altitudinal range, *A. Parishii* exhibits relatively little variation—compared, for example, with polymorphic species of more restricted occurrence, such as *A. setigera* D. Don, with which it is sometimes confused in herbaria.

Parkinson notes that the beaks of the anthers of his no. 8835 are spurred: the spurs, however, are vestigial and do not appear to warrant the recognition of this form even varietally.

A. Parishii appears to be closely allied both to *A. setigera* and to *A. variegata*, which differ principally in their apically curved corolla, and fascicled inflorescence, respectively.

Agapetes Brandisiana W. E. Evans in Notes Roy. Bot. Gard. Edinb. 15, 201, fig. 1c (1927).

A. auriculatae Hook. f. simillima, "but possibly a new species," Brandis, Ind. Trees, 405 (1906), in obs.

Mr. W. E. Evans's failure to trace the specimen communicated by Montague Hill to Sir Dietrich Brandis and referred to by the latter in his Indian Trees, *l.c. supra*, has recently been explained by the discovery of the specimen, or at least part of it, lying *perdu* in the Kew Herbarium as an undetermined specimen of *Desmogyne*! It consists of four detached leaves and a detached 10-flowered corymb. A description of the corolla and androecium, all but two of which have fallen from the inflorescence, can now be given.

Corolla subcylindrica, acutissime carinato-pentagona, angulis valde prominentibus, sursum levissime ampliata, circiter 2.6 cm. longa (usque ad apices loborum), 6–7 mm. diametro, ipsa basi usque 3–4 mm. plus minus subito angustata, glabra, e sicco ut videtur rubra et pulcherrime anfractuoso-notata; lobi triangulares, 5–6 mm. longi, basi 3–4 mm. lati, acuminati, acuti, carinati, recurvi. *Filamenta* applanata, obovato-oblancoolata, subsigmoidea, 6–7 mm. longa, 1–1.5 mm. lata, apicem versus pubescentia et valde caudato-attenuata, fere filiformia, basi corollae adnata, marginibus inter se leviter cohaerentes; antherae angustissimae, 2.5 cm. longi, sub anthesin 3–4 mm. exsertae, 3–4 mm. supra basin dorsifixae, inter se cohaerentes, parte pollinifera papillosa 5–6 mm. longa, rostris laevibus apice liberis dorso ecalcaratis. *Stylus* gracilis, 2.8 cm. longus, glaber, stigmathe parvo capitato.

UPPER BURMA. On granite boulders, hills east of Bhamo, 1950 m., Febr. 1902, *Montague Hill* 197 (Herb. Kew.; presented by Sir Dietrich Brandis, 25 Aug. 1903).

This interesting species, though superficially "similar" to *A. auriculata* Hook. f. in the cup-shaped apical expansion of the pedicel, is probably more closely allied to *A. Parishii* C.B.Cl., though the leaves of the latter are attenuate, not more or less rounded, at the base, and the cup-shaped expansion at the apex of the pedicel is not so strongly developed as in *A. auriculata*. The truncate base of the receptacle, however, sometimes shows a tendency to forming a ring-like outgrowth approaching the remarkable structure characteristic of *A. Brandisii*.

Agapetes Nuttallii C. B. Clarke in Hook. fil. Fl. Brit. Ind. 3, 445 (1881); Brandis, Ind. Trees, 405 (1906).

C. B. Clarke erroneously described the corolla of this species as "straight." It is, on the contrary, distinctly curved at the apex, indicating that the affinity is probably with *A. macrostemon*, *A. Lobbi*, etc. The species is apparently rare, being at present known only from the type collection (Bhutan, *Nuttall*).

Agapetes setigera (Wall. ms.) D. Don ex G. Don, Gen. Syst. Gard. & Bot. 3, 286 (1834); C. B. Clarke in Hook. fil. Fl. Brit. Ind. 3, 443 (1881); Brandis, Ind. Trees, 404 (1906).

Clarke's treatment of this variable species is not entirely satisfactory. A re-examination of the material in the Kew Herbarium indicates the advisability of recognising one or two additional varieties, while I am unable to follow Stapf (Bot. Mag. sub t. 9040) in raising var. *Roylei* (Kurz) C.B.Cl. to the rank of a distinct species. The following disposition of varieties is proposed.

var. **typica** *Airy-Shaw*.—Clarke's statement (*l.c.*) that the species *A. setigera* D. Don *sensu stricto* is "common" in the Khasia Hills is not borne out by the Kew material, for only three collections agree with the type in the Wallich Herbarium. These are all characterized by very large leaves: the measurements given by Clarke ("4½ by 1¾ in."—11.5 by 4.5 cm.) are quite inadequate, some of the leaves on specimens collected by Hooker and Thomson measuring up to 15 by 7 cm. The inflorescence is fairly densely setose and also finely puberulous, and the calyx-teeth are subulate, 3–4 mm. long.

KHASIA. Pundua and Sylhet, 1821, *F. de Silva*. in *Herb. Wall.* no. 752 (type of *Thibaudia setigera* Wall.). Chura, 15 June 1850, *Hooker & Thomson* 847. Mamloo, 19 June 1850, *Hooker & Thomson* 1125: "Shrub, 8-pedalis, peduncles red." *Ibid.*, 14 Nov. 1850, *Hooker & Thomson* (*sine numero*).

var. **verticillata** (Wall. ms.) C. B. Clarke in Hook. fil. Fl. Brit. Ind. *l.c.*, *sensu stricto*.—Leaves narrowly oblanceolate, 7–15 cm. long, 1.5–4 cm. wide, very conspicuously whorled in the type specimen, whorls 6–8 cm. apart; inflorescence rather sparsely setose, not puberulous in addition; calyx-segments scarcely more than 2 mm. long; corolla completely glabrous; filaments glabrous, connective pubescent at base.

KHASIA. E montibus Pundooa Bengalae orientalis, 1821, *M. R. Smith* in *Herb. Wall.* no. 753 (type of *Thibaudia verticillata* Wall.). Mahadeo, 9 Oct. 1835, *Wallich* (*Assam deputation*) (Herb. Kew.).

All the other specimens in Herb. Kew., written up by C. B. Clarke as var. *verticillata*, differ from the type specimen in the double nature of the indumentum of the inflorescence, being finely puberulous as well as glandular-setose. I propose, therefore, to distinguish them as follows.

var. **pseudo-verticillata** *Airy-Shaw*, var. nov.; a var. *verticillata* (Wall.) C.B.Cl., vera, inflorescentia non tantum glanduloso-setosa sed etiam subtiliter puberula, corolla subtiliter puberula et (praecipue secus angulos) sparse setosa recedens.

Thibaudia [sp.] Griff. Itin. Notes, 30 (1848), cum descr. brevi.

? *Vaccinium Wallichianum* Wight, Ic. Pl. Ind. Or. 4, 3, t. 1180 (1848-1850).

? *Agapetes Wallichiana* Klotzsch in Linnaea, 24, 38 (1851).

Thibaudia obliqua Griff. Notul. Pl. Asiat. 4, 301 (1854); Ic. Pl. Asiat. p. xi, t. dxv (1854).

Agapetes setigera var. *verticillata* C.B.Cl. in Hook. fil. Fl. Brit. Ind. 3, 443 (1881), pro maxima parte, secundum specimina Kewensia ab ipso auctore determinata, non *Thibaudia verticillata* Wall.

KHASIA. Between Moosmai and Mahadeb, 1837, *Griffith* 478 (Herb. Kew.). Mamloo, 29 Aug. 1850, *Hooker & Thomson* 2183 pro parte (type, Herb. Kew.): "fl. scarlet, deep." Mansmai, 1200 m., 11 Dec. 1871, C. B. Clarke 14,285: "Stamens 10, unipore. Ovary inferior. Disc very much elevated. Corolla with V-shaped striae. Calyx semi-5-fid, hairy. Corolla hairy without; stigma green." Sohra Coal Hill, 1350 m., 28 Nov. 1871, C. B. Clarke 15,195: "Calyx nearly glabrous. Corolla deep red, indistinctly V-barred."

var. **macrosepala** *Airy-Shaw*, var. nov.; a var. *typica* inflorescentia multiflora valde glanduloso-setosa atque puberula, calycis segmentis 4-6 mm. longis distincta.

Vaccinium verticillatum Wight, Ic. Pl. Ind. Or. 4, t. 1181 (1848-1850), excl. descr. (p. 4); non *Thibaudia verticillata* Wall., nec *Agapetes verticillata* D. Don.

Vaccinium hirsutum Wight, l.c. 4, 4, t. 1182 (1848-1850).

Agapetes setigera C.B.Cl. in Hook. fil. Fl. Brit. Ind. 3, 443 (1881), pro parte, non *Thibaudia setigera* Wall.

KHASIA. Pundua and Sylhet, 1821, *F. de Silva* in *Herb. Wall.* no. 752, tantum quoad unum specimen ex Herb. Hook., non in Herb. Wall. propr. "Khasiya," *Griffith* 313 (Herb. Kew.). Nunkloo, Feb. 1850, *Simons* 109. Above Cherrapunji, 1200 m., Jan. 1897, *Dr. King's Collector* (type, Herb. Kew.).

There has been much confusion and misplacement of labels in connection with Wallich's specimens of "*Thibaudia*" in the Hooker herbarium. The sheet quoted in the above paragraph bears a leafless branch with several subterminal corymbs of unexpanded flowers. It also bears four detached leaves: the three on the right of the flowering branch are, as noted on the sheet in pencil in an unknown hand, evidently those of *Agapetes variegata* D. Don; the one on the left of the branch matches those of the other specimens of var. *macrosepala* quoted above, and in all probability actually belongs to the flowering branch. The label attached to the sheet is cut from a copy of Wallich's Catalogue and bears the legend "752.

Thibaudia setigera Wall. *Thibaudiae variegatae* var.? Pundua, F. de S." The type sheet of this number in Wallich's own herbarium, however, bears two branches with numerous attached leaves and inflorescences of fully expanded flowers: the inflorescences are less setose than in var. *macrosepala* and the calyx-teeth do not exceed 4 mm. in length. C. B. Clarke, as is shown by a note attached to the Herb. Hooker sheet, mistook the three detached leaves of *A. variegata* for those of *Thibaudia verticillata* Wall. (no. 753), apparently overlooking the fourth leaf, which is obviously neither that of *variegata* nor of *verticillata*, and also the discrepancy in the sepals and flowering stage.

It is, of course, just possible that this specimen is not a Wallichian specimen at all, but part of the collection labelled "Khasiya, Griffith, 313" (cited above), which, like the "pseudo-Wallichian" specimen, is in the bud stage, and likewise emanates from the Hooker herbarium. This supposition receives support from the circumstance that Wight (l.c. *supra*) definitely states that he is "indebted to Mr. Griffith" for his specimens of *Vaccinium verticillatum* Wight, which he figures on his tab. 1181 and which certainly appears to represent var. *macrosepala*. It is difficult, however, to reconcile certain discrepancies between Wight's plate and his description. The latter is a *verbatim* translation of Dunal's Latin description in DC. Prodr. 7, 554 (1839), itself a fairly close adaptation of that in G. Don, Gen. Syst. 3, 862 (1834). The corolla is described as "glabrous" without qualification: the plate agrees with this statement except for the enlarged drawing of a flower, in which both calyx and corolla are represented as densely hairy. Wight explains for this as "entirely owing to the imperfection of our lithography, for in the original drawing it [the corolla] is shown scarcely even pubescent." Now Wallich's *Thibaudia verticillata* (*Agapetes verticillata* D. Don, cited by Wight in synonymy) has a glabrous corolla (see var. *verticillata* C.B.Cl., *supra*), but the calyx-lobes are deltoid, barely 2 mm. long.

The fact that Wight states that he obtained his specimens of *Vaccinium verticillatum* from Griffith, together with the fact that he quoted the description second-hand, instead of supplying an original one, might be taken as conclusive evidence that he never saw a type specimen of Wallich's *Thibaudia verticillata*. In the text to his tt. 1180 and 1182, however, he states that the specimens there figured were received from Dr. Wallich, "without station or name." Tab. 1182 (*Vaccinium hirsutum* Wight, sp. nov.) represents a plant almost identical with that depicted on tab. 1181, except that the calyx-segments are very slightly shorter (4-5 mm. long). The most curious feature about the plate is that the specimen figured is in bud, exactly as in the "pseudo-Wallichian" specimen no. 752 and as in Griffith's Khasia specimen from Herb. Hooker. Is it possible that at one time Wallich actually possessed specimens of the plant here distinguished as var. *macrosepala*, but confused

them with his *Thibaudia setigera* (no. 752) and distributed them as duplicates of that number, leaving none in his own herbarium? Examination of the set of Wallich's plants at Geneva would perhaps throw light on the problem, but for the present it must remain unsolved.

var. **acuminata** *Airy-Shaw*, var. nov.; a var. *verticillata* (Wall.) C. B. Clarke, vera, foliis elongatis angustissime ellipticis 10–18 cm. longis 2.5–3.7 cm. latis acuminatis, inflorescentiis puberulis (et sparse setosis), corolla secus angulos sub lente minutissime puberula distincta.

Agapetes setigera var. *verticillata* C. B. Clarke in Hook. fil. Fl. Brit. Ind. 3, 443 (1881), pro parte, non *Thibaudia verticillata* Wall.

KHASIA. Mamloo, 14 Nov. 1850, *Hooker & Thomson* (Herb. Kew.). Mahadeo, 16 Nov. 1850, *Hooker & Thomson* (type, Herb. Kew.): "Fl. obscurely angled, pink tipped with green."

var. **parviflora** (Kurz) *Airy-Shaw*, comb. nov.

Thibaudia variegata Royle, Ill. Bot. Himal. Mount. 257, t. "63a or 79," fig. 1 (1835), non *Ceratostema variegatum* Roxb. (1832).

Vaccinium variegatum var. *parviflorum* Kurz in Journ. As. Soc. Beng. 42(2), 84 (1873).

Vaccinium Roylei Kurz in Journ. As. Soc. Beng. 46(2), 214 (1877).

Agapetes setigera var. *Roylei* C. B. Cl. in Hook. fil. Fl. Brit. Ind. 3, 443 (1881).

Agapetes Roylei Stapf in Bot. Mag. 159, sub t. 9040 (1925).

KHASIA. Mamloo, 19 June 1850, *Hooker & Thomson* 1125 (Herb. Kew.). Ibid., 29 Aug. 1850, *Hooker & Thomson* 2183, pro parte (Herb. Kew.). Manksandrum, 1200 m., 7 Dec. 1871, C. B. Clarke 14,400A. Shaila, 900 m., 9 Dec. 1871, C. B. Clarke 14,873. Mansmai, 1200 m., 21 Oct. 1871, C. B. Clarke 16,260A.

Under International Rules, a variety must bear the earliest available *varietal* epithet, in this case *parviflorum* of Kurz, which antedates *Roylei* of Clarke by eight years, though Kurz perpetuated Royle's error in referring the variety to *Vaccinium* (*Thibaudia*) *variegatum*.

The specimen figured by Royle as *Thibaudia variegata* is not extant in Herb. Kew. Royle himself gives no clue as to its origin, citing only Wallich no. 751 and the localities given by Roxburgh (Fl. Ind. ed. Carey, 2, 413: 1832) for *Ceratostema variegatum*. The plate represents a plant with leaves as broad as *A. setigera* var. *typica*, and therefore considerably broader than those of any of the above-cited Khasia specimens: in this respect it approaches *A. speciosa* Hemsl.

The two portions of Hooker and Thomson's no. 2183, cited here and under var. *pseudo-verticillata* respectively, are, apart from the presence or absence of indumentum, quite indistinguishable. To accord Royle's plant specific rank, as Stapf has done, would

therefore necessitate similar treatment for var. *pseudo-verticillata* and probably several other varieties: a course which, in the present state of our knowledge, seems eminently undesirable.

Agapetes Lobbii C. B. Clarke in Hook. fil. Fl. Brit. Ind. 3, 448 (1881); Brandis, Ind. Trees, 405 (1906).

A. corallina Cowan in Notes Roy. Bot. Gard. Edinb. 18, 36 (1933).

A. stenantha Rehder in Journ. Arn. Arb. 14, 350, t. 74 (1933), e descr. et icone.

No affinity was suggested by Dr. Cowan for his *Agapetes corallina*, based on *Sukoe* 34 from Htawgaw Hill, Upper Burma, and only *A. corallina* and *A. vaccinioides* were put forward by Dr. Rehder as possible allies for his *Agapetes stenantha*, based on *Rock* 7514 from the Burma-Yunnan border. Both new species appear, however, to be indistinguishable from *A. Lobbii* C. B. Cl., itself a species whose true affinity escaped both its author and Brandis, who laid too much stress on the character of the deeply divided corolla. *A. Lobbii* not only, as Clarke says, "much resembles" *A. saligna* (Hook. f.) Hook. f., but is undoubtedly closely allied to it and also to the group with apically curved corollas, particularly *A. macrostemon* (Kurz) C.B.Cl. The corolla of *A. Lobbii* itself has a slight but quite distinct curve at the apex.

ASSAM: NAGA HILLS. Kohima, 1800 m., 28 Feb. 1882, *Watt* 6180. Pulma (?) lodge, Dec. 1886, *Prain*. Jowai, 900 m., Feb. 1897, *Dr. King's Collector*. Kohima, 25° 40' N., 94° 10' E., 1500 m., 10 Jan. 1928, *F. Kingdon Ward* 7788: "An erect epiphytic shrub, sometimes growing many feet high and branching freely, so that it may become almost as large as the supporting tree. Flowers translucent cherry red, the base of the corolla darker, the reflexed lobes almost colourless; borne in large bunches. A beautiful plant, growing in forest."

BURMA. On trees, 1500 m., Thoun-gyne (not "-gyun" as in F.B.I.), Moulmein, 1857, *Lobb* (type, Herb. Kew.): "Shrub, 3 ft. Flowers crimson with a white tip." On trees, top of "Thoung-gyein," Moulmein, 1500 m., *Lobb*: "Shrub, 3 ft. Red." (This specimen was referred by C. B. Clarke to *A. saligna* Hook. f.). (There is also a *Lobb* specimen in Herb. Kew. received from Messrs Veitch in March 1868 under the number 49.) Lat. 26° 14' N., long. 98° 25' E., 2400 m., May 1925, *Forrest* 26,591: "Shrub, 4 ft., epiphytic on forest trees on the hills. Flowers ruddy green." Upper Chindwin Distr.: Uyu Res., Mansi Div., slope of Taungthonlon peak, 1500 m., 23 Feb. 1929, *Sukoe* 9052: "Parasitic shrub on other trees. Stem brownish. Leaves caudate. Fl. purplish, on old twigs or stem." Myitkyina Distr.: Langyang (Htawgaw), 1200 m., 15 June 1929, *Sukoe* 10,101: "Epiphytic shrub. Roots tuberous. Fruit silvery light green, pedicellate." Htawgaw Hill, 1380 m., 30 Nov. 1930, *Sukoe* 34.

Agapetes Moorei Hemsl. in Bot. Mag. 129, t. 7928 (1903).

A. Unwinii W. E. Evans in Notes Roy. Bot. Gard. Edinb. 15, 205, t. ccxxi (1927).

Comparison of the type specimens of these two species leaves no doubt as to their being conspecific. The affinity of *A. Moorei* is evidently with *A. macrostemon* (Kurz) C. B. Cl., as noted by Mr. Evans for *A. Unwinii*, but Hemsley compared it only with *A. setigera* D. Don and *A. verticillata* D. Don, in which the filaments are very short. He remarked, however, that "in floral structure it is more closely related to *A. buxifolia* Nutt.," a species with small leaves and solitary flowers, but with rather long filaments somewhat geniculate at the base as in *A. Moorei*. The corolla of *A. buxifolia* is, however, straight, not curved at the apex, and the slender habit and small leaves in conjunction with the long filaments are sufficient to exclude the possibility of relationship with the present species.

Some doubt attaches to the country of origin of the type-specimen of *A. Moorei*. It was said to have been imported with a species of orchid believed to be a native of Sikkim. But Professor R. Unwin's discovery of the plant in 1926 on Mount Victoria, east central Burma, makes it highly probable that Burma was also the source of the original specimen, since no species of *Agapetes* are as yet known both from that country and from the Sikkim Himalaya.

Agapetes sp. nov. (material insufficient for description).

ASSAM. Delei valley, 28° 5' N., 96° 30' E., 1500 m., 19 Mar. 1928, F. Kingdon Ward 7977 (Herb. Kew.); "A small erect branching undershrub, growing on granitic rocks in full sun. In fruit."

Probably near *A. salicifolia* C.B.Cl., but the leaves are much broader and the axis of the inflorescence is very short.

Series ii. GRACILES.

Leaves over 6 cm. long, often long and narrow:

Leaves over 1.5 cm. wide:

Calyx-limb entire or shallowly undulate, widely cup-shaped; leaves firmly coriaceous, margin generally revolute.....

A. neriifolia (King et Prain) Airy-Shaw

Calyx-limb distinctly 5-fid, more or less erect:

Calyx-limb divided about half-way down; leaves firmly coriaceous, up to 4 cm. wide.....

A. pseudo-Griffithii Airy-Shaw

Calyx-limb divided to base; leaves thinly chartaceous, almost membranous:

Leaves oblong, abruptly and shortly caudate, narrowed at base, 8-15 cm. long, 2-5 cm. wide.....

A. Griffithii C. B. Clarke

Leaves lanceolate, gradually attenuate-acuminate, rounded at base, 7-8.5 cm. long, 1.5-2.1 cm. wide.....

A. hyalocheilos Airy-Shaw

Leaves less than 1.5 cm. wide:

Calyx-limb divided to base; peduncle puberulous; pedicels not expanded into a cup at apex.....*A. nutans* Dunn

Calyx-limb divided half-way down or less; peduncle glabrous; pedicels expanded into a cup at apex:

Peduncle and pedicels much thickened upwards; corolla subconical, up to 1.5 cm. long.....

A. linearifolia C. B. Clarke

Peduncle and pedicels uniformly slender; corolla cylindric, 2-2.5 cm. long.....*A. angustifolia* (Knagg) Airy-Shaw

Leaves less than 6 cm. long:

Leaves acuminate or subacuminate, 2-5 cm. long; inflorescence several-(up to 8-) flowered:

Leaves cuneate at base; pedicels with distinct cupular expansion at apex; calyx-limb membranous, widely cup-shaped, about 8 mm. long, divided to about three-fourths; corolla divided almost to base into linear segments.....

A. discolor C. B. Clarke

Leaves subcuneate to rounded at base; pedicels not or scarcely cupuliform-expanded at apex; calyx-limb herbaceous, divided almost to base into short deltoid segments scarcely 2 mm. long; corolla-lobes very short, deltoid, about 1 mm. long.....

A. Forrestii Diels

Leaves acute but not acuminate, less than 2 cm. long; inflorescence 1-2-flowered:

Nerves rather finely elevate-reticulate, especially above; inflorescence a very slender 2-flowered corymb, peduncle and pedicels subequal, together up to 4.5 cm. long; calyx-segments lanceolate, about 3 mm. long; corolla nearly 2.5 cm. long.....*A. mitrarioides* Hook. fil.

Nerves deeply impressed above, invisible below; inflorescence 1-2-flowered, almost a fascicle, the peduncle almost obsolete, pedicels up to 1 cm. long; calyx-segments deltoid, 1-2 mm. long; corolla up to 1.5 cm. long.....

A. praeclara Marquand

Agapetes neriifolia (King et Prain) Airy-Shaw, comb. nov.

Desmogyne neriifolia King et Prain in Journ. As. Soc. Beng. 67 (2), 297 (1898); Prain in Ann. Roy. Bot. Gard. Calc. 9 (1), 46, t. 59 (1901); Brandis, Ind. Trees, 406 (1906); Evans in Notes Roy. Bot. Gard. Edinb. 15, 207 (1927).

Agapetes Desmogyne King et Prain, l.c., 298, nomen eventuale.

The series *A. Griffithii* C. B. Cl.—*A. nutans* Dunn—*A. linearifolia* C. B. Cl.—*Desmogyne neriifolia* King et Prain provides such a gradual transition from more "typical" species of *Agapetes* to the extreme type represented by *D. neriifolia* that the reduction of

Desmogyne to *Agapetes* becomes a matter of course. King and Prain (Journ. As. Soc. Beng. 67 (2), 297 : 1898), when establishing *Desmogyne*, contemplated the possibility of this reduction, but regarded such a union as contingent upon the similar reduction to *Agapetes* of the genus *Pentapterygium*. It is possible that a critical review of this alliance may indicate the desirability of the latter reduction, but *Pentapterygium* is so much more distinct from *Agapetes* than is either *Desmogyne* or *Corallobotrys* that (provisionally, at least) it seems preferable to keep them distinct.

Under International Rules the name *Agapetes Desmogyne*, proposed by King and Prain (*l.c.*) for *Desmogyne neriifolia* in the event of its transference to *Agapetes*, cannot be used, being a *nomen eventuale*. The epithet accepted and published by the authors was *neriifolia*, necessitating the new combination effected above. *Desmogyne angustifolia* Knagg in Notes Roy. Bot. Gard. Edinb. 14, 73 (1923) similarly becomes ***Agapetes angustifolia*** (Knagg) Airy-Shaw, comb. nov. No material has yet been seen of *Desmogyne minor* King et Prain in Ann. Roy. Bot. Gard. Calc. 9 (1), 47 (1901), in obs. : the transference (if necessary) is therefore held over until the opportunity occurs of examining the type specimen.

Agapetes pseudo-Griffithii Airy-Shaw, sp. nov. a peraffini *A. Griffithii* C. B. Cl. foliis angustioribus sensim acuminatis (nec subito caudatis) firme coriaceis (nec tenuiter chartaceis) satis distincta.

Frutex epiphyticus, ut videtur parum ramosus. *Rami* teretes, 1-2.5 mm. diametro. *Folia* lanceolata usque oblonga, rarius elliptica vel fere oblanceolata, 9-14 cm. longa, 2-4 cm. lata, basi subcuneata usque subrotundata, apice sensim caudato-acuminata subtilissime acuta, integerrima, plana vel marginibus levissime recurva, firme coriacea, glaberrima, siccitate griseo-viridia, costa supra impressa infra prominente, nervo submarginali utrinque unico conspicuo fere usque ad apicem percurrente, nervis ceteris secundariis indistinctioribus supra impressis infra prominentibus valde reticulatis ; petiolus 4-8 mm. longus, 1-2.5 mm. crassus, transverse rugulosus, supra sulco alto percursus, fuscus vel cortice exfoliato lutescens. *Racemi* axillares, corymbiformes, 4-6-flori, toti 7-11 cm. longi ; axis 3.5-7 cm. longus, inferne per 3-6 cm. nudus, parte superiore ubi pedicelli oriuntur incrassata ; pedicelli incrassati, subcarnosi, 0.5-2 cm. longi, basi bractea minuta deltoidea acuta atque bracteolis duabus similibus suffulti, longitudinaliter 5-costati, glaberrimi, apice in cupulam 3-4 mm. diametro 2 mm. altam expansi. *Calyx* (incluso receptaculo 2-3 mm. diametro) totus 1.3-1.5 cm. longus, 5-7 mm. latus, membranaceus, venosus, glaber, tubi parte libera 5-6 mm. longa, dentibus erectis lanceolato-subulatis acutissimis 5-6 mm. longis basi 2-3 mm. latis. *Corolla* cylindrica, basi leviter angustata, circiter 2.6 cm. longa (inclusis dentibus parvis deltoideis acutis erectis viridibus 2-2.5 mm. longis et latis),

5-10 mm. lata, corallina, glaberrima. *Stamina* tota circiter 2.5 cm. longa : filamenta applanata, lineari-subulata, circiter 5 mm. longa, vix 1 mm. lata, sub lente parce minutissime puberula ; antherae circiter 2.1 cm. longae, anguste subulatae, paullum supra basin dorsifixae, thecis minutissime papillois, rostris laevibus apice conniventibus dorso ecalcaratis. *Stylus* gracillimus, 2.5 cm. longus, stigmatibus albo punctiforme. *Fructus* ignotus.

UPPER BURMA. Hills east of the Nam Tisang, 1200-1500 m., 5 Jan. 1931, *F. Kingdon Ward* 9101 (Herb. Mus. Brit.) : "Epiphyte in the jungle. Flowers crimson." Nam Tamai valley, 1200-1500 m., 15 Jan. 1931, *F. Kingdon Ward* 9144 (type, Herb. Mus. Brit.) : "A common epiphyte in the forest. Flowers crimson with green teeth."—I refer also to this species the following imperfect specimen : Nam Tisang-Mali divide, 1800 m., 13 Nov. 1922, *F. Kingdon Ward* 5551 (Herb. Edin.) : "Epiphyte in the forest. Flowers stiff, like wax. Corolla tube coral red, the tips of the perianth lobes dull green."

var. ***Abbayana*** Airy-Shaw, var. nov. calycis aequilongi ac in typo lobis subduplo brevioribus deltoideis 2-3 mm. longis, foliis haud ultra 10.5 cm. longis et 2 cm. latis distincta.

UPPER BURMA. N.E. Frontier, 1913, *Capt. B. N. Abbey* (type, Herb. Edin.).

Closely allied to *A. Griffithii* though the present species undoubtedly is, the leaf-shape and texture at once distinguish it. Unfortunately the type specimen of *A. Griffithii* is in extremely young bud, rendering a comparison of floral parts impossible, since no later collection of that species is available. The inflorescence of *A. pseudo-Griffithii* is very similar to that of *A. linearifolia* C. B. Cl., but the corolla of the latter is only about half as long.

In the variety *Abbayana* the calyx is approximately the same length as in the type, but, instead of being divided half-way down, is scarcely divided to one quarter. All the corollas have fallen from Abbey's specimen.

Agapetes linearifolia C. B. Clarke in Hook. fil. Fl. Brit. Ind. 3, 449 (1882) ; Airy-Shaw in Hook Ic. Pl. 33, t. 3254 (1935), *ined.* ; descr. hic amplif. ; ab *A. mutante* Dunn inflorescentia multo brevius pedunculata, pedunculo glabro, pedicellis apice conspicue cupulatum expansis, calyce maiore vix ad medium usque fisso, corolla subduplo breviori discedit ; ab etiam affinis *A. neriifolia* (King et Prain) Airy-Shaw foliis angustioribus, calyce 5-lobo nec subintegro, corolla multo minore, ab *A. angustifolia* (Knagg) Airy-Shaw pedicellis carnosius nec filiformibus, praecipue differt.

Suffrutex epiphyticus, radicibus scandens, glaberrimus, basi bulbosa vel tumida (teste F. K. Ward), radices tuberosas anguste napiformes hinc inde emittens. *Caules* humiles, parce ramosi, 30-40 cm. alti, 1-2 mm. crassi, teretes, lenticellis parvis sparsis

praediti, cortice cinereo-brunneo. *Folia* alterna, subdistiche disposita, lanceolato-linearia, 10–15 cm. longa, 0.7–1.3 cm. lata, in apicem acutissimum sensim attenuata, basi in petiolum robustum 2–4 mm. longum supra canaliculatum rotundato-contracta, margine valde revoluta, pagina superiore siccitate plumbeo-viridi costa impressa, pagina inferiore pallidiore et laetiore vel rufescente costa valde prominente, nervis lateralibus obscuris. *Racemi* axillares, pendentes, corymbosi, foliis breviores, usque 8 cm. longi; axis 1.5–4.5 cm. longus, apicem versus incrassatus, striatus; bracteae et bracteolae minutissimae, deltoideae, ima basi pedicellorum sitae. *Pedicelli* apicem axis versus conferti, ex foveolis velut excavationibus eius orti, ima basi subito valde contracti, apicem versus incrassati, usque 2.2 cm. longi, apice articulati et in cupulam 2–5 mm. diametro ovarium (receptaculum) sub anthesin semi-amplexantem expansi. *Receptaculum* subglobosum, sub anthesin 2–3 mm. longum et latum, sed post fecundationem statim valde auctum, usque 1 cm. diametro, scarlatinum. *Calyx* breviter ellipsoideo-cylindricus, 5–6 mm. diametro, tubo 3–6 mm. longo membranaceo 5-nervi, lobis anguste triangularibus circiter 3 mm. longis basi 1–3 mm. latis acutissimis. *Corolla* cylindrico-conica, 1.3–1.4 cm. longa, basi circiter 4 mm., ore circiter 2 mm. diametro, lobis brevissimis deltoideis acutis vix recurvis, glabra, viridis, glaucescens, basi siccitate pallidiore. *Filamenta* circiter 5 mm. longa, glabra, nonnunquam abnormaliter in tubum plus minus perfecte connata. *Antherae* anguste lanceolatae, 9–10 mm. longae, ad sinus corollae attingentes, thecis densissime scabro-papillosis circiter 4 mm. longis dorso ecalcaratis basi obscure appendiculatis, rostris siccitate pallidis laevibus 5–6 mm. longis inferne connatis dorso ecalcaratis. *Stylus* filiformis, 1.4 cm. longus, stigmate inconspicuo. *Fructus* ignotus.

ASSAM. Mishmi Hills: Thumath Summit, 1836, *Griffith* (Kew distrib. no.) 3480 (type): "Frutex epiphytic. Pedunc. pedicell. calyc. rosaceo-carneis, alab. livido-caeruleis." Camp, Chibaon, Delei valley, 28°10' N., 96°30' E., 1800 m., 6 Apr. 1928, *F. Kingdon Ward* 8021: "An epiphytic root climber. Base bulbous. Corolla green; pedicel, calyx and ovary scarlet. Flowers passing over. A somewhat straggling and lolling plant of the temperate rain forest."

It is satisfactory to be able to complete the description of this rare and distinct species from the excellent specimens brought home by Capt. Kingdon Ward, nearly a century after the original discovery of the species by Griffith. Except that the leaves of the type specimen are rather more strongly revolute, the agreement between Griffith's sterile and Ward's flowering specimens is perfect.

Agapetes hyalocheilos *Airy-Shaw*, sp. nov. ex affinitate *A. Griffithii* C. B. Cl., a qua foliis minoribus lanceolatis subsessilibus basi rotundatis, pedunculo duplo brevior recedit.

Agapetes saligna var. *cordifolia* C. B. Cl. in Hook. fil. Fl. Brit. Ind. 3, 445 (1881).

Frutex epiphyticus. *Ramuli* graciles, lenticellis parvis rotundis parce conspersi. *Folia* lanceolata, 7–8.5 cm. longa, 1.5–2.1 cm. lata, basi rotundata (unde epitheton Clarkeianum "*cordifolia*" plane ineptum), subcaudato-acuminata, subtilissime acuta, integra, angustissime hyalino-cartilagineo-marginata, plana, glabra, submembranacea, costa et nervis marginalibus gracilibus, nervis ceteris inconspicuis; petioli 1–2 mm. longi. *Racemus* (in specimine unicus) brevis, axillaris, corymbiformis, axi vix 1.5 cm. longo gracili glabro, floribus e summo triente ortis. *Pedicellus* (e flore unico suppetente) fere 1.9 cm. longus, sursum sensim ampliatus, glaber, basi bractea minuta deltoidea suffultus, bracteolis non visis. *Calyx* totus 6–7 mm. longus, basi truncatus, apici pedicelli aequilatus, glaber, segmentis subulatis acutis 3 mm. longis fere usque ad basin liberis dorso carinatis. *Corolla* anguste infundibularis, 2 cm. longa, basi 4 mm. ore 9 mm. diametro, lobis brevissimis late deltoideis rotundatis brevissime reflexo-cuspidatis 1–2 mm. longis 2–3 mm. latis. *Stamina* tota fere 1.8 cm. longa: filamenta applanata, 2–3 mm. longa, fere 1 mm. lata, minute papilloso-ciliolata; antherae 1.5–1.6 cm. longae, inferne papillosae, superne laeves, dorso ecalcaratae, rostris liberis. *Stylus* 2 cm. longus, filiformis, stigmate punctiformi. *Fructus* ignotus.

ASSAM (E. BHUTAN). Daphla Hills: Teniv Lampa, 1050 m., 1880, *Dr. G. King* (type, Herb. Kew.): "Vaccinium growing on trees."

This appears to be so distinct from any known species that I have ventured to describe it in spite of the meagre material available. It is strange that Clarke should have treated it as a variety of *A. saligna* Hook. f., which has very different coriaceous leaves with strongly impressed veins, and inflorescences from the old wood. Membranaceous leaves are not common in this genus, *A. Griffithii* C. B. Cl. being the only other species with leaves comparable in texture.

Attached to the sheet in the Kew Herbarium is a drawing of the specimen, in which the only flower is represented as springing terminally from the extreme apex of the branchlet. Apparently Clarke did not recognise the mistake, for he has written below the drawing: "I do not understand the inflorescence!"

Agapetes Forrestii *W. E. Evans* in Notes Roy. Bot. Gard. Edinb. 15, 202, t. ccxx (1927).

ASSAM. Chibaon, Delei Valley, 28°10' N., 96°30' E., 2100–2400 m., 12 Apr. 1928, *F. Kingdon Ward* 8061: "Epiphytic in the mixed forest, common on the ridge. Usually hanging down in long loose branches. Flowers scarlet, the points of the corolla green."

UPPER BURMA. Base Camp, Seinghku Wang, 1800 m., 24 May 1926, *F. Kingdon Ward* 6749: "Epiphyte on moss-bound gnarled trees in dense tanglewood forest, on steep sheltered slopes. Corolla bright brick-red with a regular **WW** pattern of darker veining; teeth green."

The leaves of no. 6749 are broader and shorter than usual, reaching 1.7 cm. in width but not exceeding 3 cm. in length. *A. Forrestii* may possibly, as Evans suggests, be very distantly related to *A. Bulleyana* Diels, but its closest affinity is with *A. mitrarioides* Hook.f. ex C. B. Cl. and *A. praeclara* Marquand, from both of which it is readily distinguished by its larger caudate leaves.

Agapetes praeclara Marquand in Journ. Linn. Soc. 48, 197 (1929).

S.E. TIBET. Tsangpo Gorge, near Pemakochung, 2100 m., 28 Nov. 1924, F. Kingdon Ward 6323 (type): "Hanging from rocks and trees in the rain forest. Flowers crimson, just opening."

Although no further material of this species (the only one collected on the 1924 expedition) has been seen, I enumerate it here for the sake of completeness. The opportunity is taken also of pointing out that the resemblance to *A. Lacei* Craib is probably only a superficial one: the true affinity of *A. praeclara*, despite the great reduction of the peduncle, is certainly with *A. Forrestii* Diels, with which it agrees in the texture, nervation and colour of the leaves, and in floral structure. In *A. Lacei* the leaves, in the dried state, are transversely wrinkled on the upper surface in a very characteristic manner, the nerves being quite invisible; whereas in *A. Forrestii* and the present species the nerves are almost bullately impressed. The difference in length of filaments, noted by Marquand, corresponds to the definitions of the two series (*Graciles* and *Longifiles*) to which *A. praeclara* and *A. Lacei* respectively belong.

Series iii. LONGIFILES.

Flowers racemose or corymbose (peduncle developed):

Bracts large, 5–15 mm. long, 2–4 mm. wide, persistent:

Leaves rather abruptly caudate-acuminate, up to 6 cm. long; calyx-teeth distinct almost to base; corolla divided at least half-way down into linear lobes.....

A. bracteata Hook.fil.

Leaves gradually acuminate-attenuate, 12–18 cm. long; calyx-teeth connate more than half-way; corolla-lobes very short, deltoid.....

A. Pottingeri Prain

Bracts minute or early caducous; leaves rather abruptly to gradually acuminate, very stiffly coriaceous; calyx-teeth connate half-way; corolla-lobes very short, deltoid.....

A. adenobotrys Airy-Shaw

Flowers fascicled or solitary (peduncle obsolete):

Pedicels elongate, filiform, 1.5–2.3 cm. long; corolla subcampanulate, 5–7 mm. long; leaves very abruptly caudate.....

A. pilifera Hook. fil.

Pedicels less than 1.5 cm. long, rarely exceeding 1 cm.; corolla cylindric, at least 1 cm. long:

Leaves 4–11.5 cm. long, chartaceous; bud-scales very large, lanceolate, up to 1.5 cm. long; flowers fascicled; pedicels up to 1 cm. long; receptacle long-setose; filaments glabrous.....

A. oblonga Craib

Leaves mostly less than 4 cm. long, mostly coriaceous:

Flowers distinctly pedicellate (pedicel at least 5 mm. long):

Leaf-base distinctly cuneate, lamina over 1.5 cm. long:

Anthers ecalcarate; leaf-apex acute to subobtusate:

Leaves quite entire, acutely pungent-cuspidate; corolla-lobes deltoid, 1–1.5 mm. long.....

A. Wardii W. W. Sm.

Leaves crenate-dentate towards subobtusate apex; corolla-lobes narrowly triangular, about 5 mm. long.....

A. buxifolia Nutt.

Anthers dorsally bicalcarate; leaf-apex rounded or obtuse, rarely subacute:

Leaves narrowly elliptic-oblancheolate, 2.5–3 cm. long, 7–9 mm. broad, retuse; receptacle densely cinereo-puberulous; corolla up to 3.8 cm. long, externally minutely puberulous; filaments glabrous.....

A. Kanjilali A. Das

Leaves obovate (or, if narrowly oblancheolate, less than 6 mm. wide), obtuse or apiculate; receptacle glabrous or sparingly and minutely puberulous; corolla 0.5–2 cm. long; filaments pubescent:

Leaves 7–22 mm. wide:

Leaves chartaceous to moderately coriaceous, oblancheolate to obovate, sometimes oblong-elliptic; nerves reticulate, clearly visible; corolla orange-red to crimson (Yunnan, Burma, Siam).....

A. Hosseana Diels

Leaves very coriaceous, oblancheolate to obovate; nerves immersed, very obscure; corolla white (Yunnan)....

A. yunnanensis Franch.

Leaves small, oblancheolate, 3–6 mm. wide (Khasia): Corolla cylindric, about 1.3 cm. long, greenish-white.....

A. Mannii Hemsl.

Corolla short, subcampanulate (conical in bud), 5–8 mm. long, "pale reddish brown" (teste Hook.fil. in Herb. Kew.).....

A. obovata (Wight) Hook.fil.

Leaf-base rounded, lamina 1–1.5 cm. long, rigidly coriaceous, apex subacute; flowers solitary or rarely 2 together; pedicel setose and finely puberulous, 1.3–1.7 cm. long; receptacle sparingly or densely setose or finely puberulous, or both, or glabrous; filaments glabrous; anthers ecalcarate.....

A. Lacei Craib

Flowers subsessile or very shortly pedicellate (pedicel rarely up to 4 mm. long), solitary; corolla pubescent outside; filaments pubescent; anthers bicalcarate:

Leaf-base cuneate, lamina narrowly obovate, shallowly crenulate-dentate above middle; nerves conspicuously elevate-reticulate above and below; receptacle shortly and finely pubescent.....*A. spissa* Airy-Shaw

Leaf-base rounded, lamina broadly ovate, entire; nerves obscure or impressed above; receptacle long-setose:

Leaves glabrous and almost shining beneath, over 1.5 cm. long and 1 cm. broad.....

A. brachypoda Airy-Shaw

Leaves shortly pilose beneath, up to about 1.5 cm. long and 1 cm. broad.....*A. pensilis* Airy-Shaw

Agapetes adenobotrys *Airy-Shaw*, sp. nov. ex affinitate *A. Pottingeri* Prain (e descriptione et icone), a qua foliis 4-4.5 cm. tantum longis nervis obscuris, racemo corymboso, bracteis ut videtur nullis sed bracteolis usque 4 mm. longis evolutis distinctissima; ab etiam affini *A. bracteata* Hook. f. ex C.B.Cl. (cuius folia simillima sed tenuiora) inflorescentia corymbosa, indole aliena bractearum et bracteolarum, calyce (ut in *A. Pottingeri*) tantum ad medium usque fisso, corollae lobis (sicut illius speciei) brevissimis statim distinguenda.

Frutex epiphyticus. *Rami* teretes, ut videtur anfractuosi, cortice pallide cinereo, iuniores parce longisetosi. *Folia* ovata, 4-4.5 cm. longa, 1.5-2 cm. lata, basi subrotundata, apice abruptiuscule caudato-acuminata, acutissima, integra, margine plana usque subrevoluta, glaberrima, crasse coriacea, olivacea, costa supra prominente infra inconspicua vix elevata, nervis supra parum elevatis infra valde obscuris; petiolus brevissimus vel subnullus. *Racemus* terminalis (? an semper), corymbosus, ima basi perulis paucis ovatis acutis fusco-brunneis suffultus, totus 6 cm. longus: axis 3.5 cm. longus, sat gracilis, subtiliter albo-puberulus pilis sparsis longis glandulosis intermixtis; pedicelli 1-1.5 cm. longi, sursum levissime ampliati, eodem modo ac pedunculus (axis) vestiti; bractea suffulciens ut videtur haud evoluta, saltem cito caduca nec in specimine suppetens; bracteolae tamen binae oppositae ima basi omnis pedicelli conspicuae, ovatae, acuminatae, 2-4 mm. longae, carinatae, castaneo-membranaceae, subtilissime ciliolatae. *Receptaculum* circiter 2 mm. longum et latum, indumento duplici densissime vestitum, pilis glanduliferis 1 mm. longis ut videtur roseis. *Calyx* (receptaculo excluso) 5-7 mm. longus, usque ad medium fissus, subtilissime albo-puberulus sed sine pilis glanduliferis, membranaceus, venosus, roseus, segmentis late subulatis acutis erectis. *Corolla* cylindrica, 2.1 cm. longa, 3-5 mm. diametro, crispule albo-pubescent, secus angulos glanduloso-pilosus, corallinus, lobis parvis deltoideis 1 mm. longis erectis ut videtur viridescentibus. *Stamina* tota circiter 1.9 cm. longa: filamenta

applanata, linearia, circiter 1.2 cm. longa, 0.5 mm. lata, glaberrima; antherae anguste lineari-lanceolatae, 9-10 mm. longae, 2-3 mm. supra basin dorsifixae, minute papillosoe, dorso bicalcaratae, calcaribus plerumque altero sursum altero deorsum spectantibus 1 mm. longis gracilibus obscure vel vix scaberulis, rostris liberis. *Stylus* gracilis, fere 2 cm. longus, stigmatibus punctiformi. *Fructus* ignotus.

UPPER BURMA. Hills E. of the Nam Tisang, 1500-1800 m., 5 Jan. 1931, *F. Kingdon Ward* 9099 (type, Herb. Mus. Brit.): "Epiphyte in the forest. Flowers crimson."

A very distinct and in some respects anomalous species, unfortunately represented by rather scanty material consisting of a small leafy branchlet with one terminal inflorescence. Its affinities undoubtedly lie with *Agapetes Pottingeri* and *A. bracteata*, the flowers agreeing closely with those of the former (judging by the plate in Ann. Roy. Bot. Gard. Calc. 9 (1), t. 58: 1901), whilst the leaves are almost indistinguishable in size and shape, though not in texture, from those of the latter. The form of the inflorescence—a corymb instead of an elongate raceme—and the development of the bracteoles, apparently at the expense of the bracts which are so conspicuous in the two species mentioned, are points of notable divergence.

Prain, when describing *A. Pottingeri* (Journ. As. Soc. Beng. 67 (2), 296: 1898), constituted this species the type of a new section, *Holocalyx* Prain, distinguished by the large bracts and by the limb of the calyx not being divided to the base into five teeth. He appears to have overlooked, or been unaware of, *A. bracteata*, since he states that by the two characters mentioned his species is "separable from all hitherto described *Agapetes*." The type of *A. Pottingeri*, presumably preserved in the Calcutta herbarium, is unfortunately not available for direct comparison but, as shown in the plate, the bracts appear very similar to those of *A. bracteata*. The latter species, however, breaks down the calyx character to which the section *Holocalyx* owes its name, for the calyx-segments are separate almost to the base, as in many other species of *Agapetes*. Brandis recognized the close relationship of these two species in his Indian Trees, 405 (1906).

The dense, almost setose, glandular covering of the receptacle in the present species (and also in *A. Pottingeri*) recalls the very similar, but eglandular, indumentum of *A. oblonga* Craib. Calyx, corolla and androecium, indeed, are so very alike in these three species, and the leaf-shape, texture and nervation in *A. Pottingeri* and *A. oblonga*, that, in spite of considerable divergences in certain points, the conclusion that real affinity is involved is irresistible. An instructive inflorescence-series can be drawn up from these species, as follows:—

A. bracteata: elongate, bracteate raceme; calyx and corolla deeply divided.

A. Pottingeri: subcorymbose, bracteate raceme; calyx and corolla-lobes very short.

A. adenobotrys: corymb, bracteate or bracts early deciduous; perianth as above.

A. oblonga: fascicle, few- to many-flowered; bracts early deciduous; perianth as above.

The final stage in the evolution of the inflorescence of this series is the reduction of the fascicle to a solitary subsessile flower, as in certain species described below (see pp. 49-53).

In the reverse direction it is easy to go further back than *A. bracteata*. A short and obvious step leads to *Vaccinium Dunalianum* Wight and its allies—*V. camphorifolium* Hand.-Mazz., *V. urceolatum* Hemsl., *V. caudatifolium* Hayata (if indeed these three are really distinct from *V. Dunalianum*) and *V. arbutoides* C.B.Cl. [*V. gaultheriifolium* Hook. f. and *V. glauco-album* Hook. f., through sandwiched between *V. Dunalianum* and *V. arbutoides* in the "Flora of British India," are not closely allied to them; C. B. Clarke's arrangement is misleading in this respect]. Probably Dunn's *Agapetes parviflora* and *A. vaccinioides* also are not distantly related. In all these species, however, the bracts are deciduous. *Vaccinium bracteatum* Thunb. and its allies, in which the bracts are persistent as in *Agapetes bracteata*, belong to a very different circle of affinity.

The above considerations seem to afford strong evidence of the artificiality of *Vaccinium*, Sect. *Epigynium*, and *Agapetes*, at least as at present circumscribed.

Agapetes pilifera Hook. fil. ex C. B. Clarke in Hook. fil. Fl. Brit. Ind. 3, 448 (1881); Brandis, Ind. Trees, 405 (1906).

UPPER BURMA. Nam Tamai valley, 1200-1500 m., 22 Jan. 1931, F. Kingdon Ward 9154 (Herb. Mus. Brit.): "A small tree or large epiphytic shrub, in the open forest. Flowers more or less green, rosy on one side, practically over. Ripe berries black."

The ripe fruits, not previously collected, are globose, about 5 mm. in diameter.

This curious and anomalous species, which might almost constitute a distinct genus, was probably rightly associated by C. B. Clarke with *A. bracteata* Hook. f., an affinity which is supported both by the leaf-shape (abruptly caudate-attenuate) and the glandular-hairy pedicels. The small, subcampanulate corollas are so similar to those of *Vaccinium Dunalianum* Wight and its allies that it might with almost equal justice be placed in that genus; the fasciculate inflorescence and elongate pedicels however, would create an even greater anomaly in *Vaccinium* than is now occasioned in *Agapetes* by the "vaccinioid" corolla. [Cf. *A. acuminata* (p. 25) and *A. obovata* (pp. 26, 45).]

Agapetes oblonga Craib in Bull. Misc. Inf. Kew, 1913, 43; W.E. Evans in Notes Roy. Bot. Gard. Edinb. 15, 204 (1927).

UPPER BURMA. Seinghku Wang, 1500-1650 m., 15 May 1926, F. Kingdon Ward 6710 (Herb. Kew.): "Epiphyte, with long limp branches which hang down many feet, over the river or elsewhere. Flowers scarlet, with a green rim. The young fruit is bearded with long crimson hairs." Nam Tamai valley, 1200-1500 m., 15 Jan. 1931, F. Kingdon Ward 9145 (Herb. Mus. Brit.): "Epiphyte in the forest. Flowers crimson, hardly open. Common. (Also in Assam)."

Ward's no. 9145 brings the maximum leaf-measurements from 9.5 by 3.5 cm., found by Evans for Forrest's and Farrer's specimens, up to 11.5 by 4.5 cm. These large-leaved forms are, as noted under *A. adenobotrys* (p. 47, *supra*), very similar to *A. Pottingeri*.

Agapetes Kanjilali A. Das in Assam Forest Records (Botany), 1, 13, t. 6 (1934); Airy-Shaw in Hook. Ic. Pl. 33, t. 3255 (1935), *ined.*

ASSAM. Lakhimpur Distr.: Makum Range, 105 m., April 1914, Upendranath Kanjilal 4090 (type number): "Epiphytic. Corolla not transversely marked."

Vernacular name (Assam): *Horu Gumani*.

The above specimen came into the possession of the Kew Herbarium with the herbarium of the late J. S. Gamble and is doubtless the one referred to by Das (*l.c.* 14) as having been sent to Gamble by Rai Bahadur. On the sheet is written in Gamble's handwriting: "near *A. yunnanensis* Franch. [and] *A. Hosseana* Diels but doesn't quite suit either," and in a capsule attached to the sheet is a carefully dissected flower and a drawing of a stamen, $\times 2$, dated 24-12-14, the year in which the specimen was collected. Gamble's suggestion as to the affinity of this species is certainly correct, but the differences are much greater than his "doesn't quite suit" would indicate. The flowers are about twice as large, and the great length of the filaments, which are glabrous, not pubescent, is unique in the genus. The apparently coalescent beaks of the anthers are also a peculiar feature.

Agapetes spissa Airy-Shaw, sp. nov., habitu atque foliorum figura *A. Wardii* W. W. Sm. accedens, a qua tamen calycis hirsuti segmentis brevibus, corolla pubescente et foliis denticulatis (nec integerrimis) recedit; ex affinitate proxima *A. pensilis* Airy-Shaw et *A. brachypodae* Airy-Shaw (*vide infra*), a quibus differt caulibus rigidis creberrime verticillato-ramificatis, foliis obovatis crenulato-denticulatis basi cuneatis nervis utrinque pulchre prominenter reticulatis differt.

Suffrutex parvus, epiphyticus. *Caules* robusti, rigidi, dense ramosi, usque 5 mm. crassi, cortice fusco-brunneo longitudinaliter striato lenticellis parvis pallidis rotundis vel lateraliter elongatis parce notato; rami miro modo verticillati vel subverticillati, usque 10 ex eodem loco ut videtur nascentes, rigidi, recti, patuli, foliosis-

simi, dense patenti-hirsuti, perulis lineari-lanceolatis 5–10 cm. longis membranaceis brunneis vel eorum vestigiis emarcidis etiam crebre vestiti; innovationes longe ferrugineo-hirsuti. *Folia* obovata, rarius subelliptica, 2–2.5 cm. longa, 7–10 mm. lata, in petiolum brevissimum cuneato-angustata, apice subacuta usque subobtusata, margine subrevoluta crenulato-denticulata denticulis minute apiculatis, basin versus subintegra, glaberrima, supra nitida siccitate surde fusco-viridia, subtus obscuriora pallidiora (innovationum subpurpurascencia); costa et nervi utrinque pulchre prominenter reticulati, intra marginem anastomosantes; petiolus subnullus. *Flores* solitarii, axillares, pedicello circiter 2 mm. longo basi perulis vel bracteolis paucis minutis instructo. *Receptaculum* obconicum, pedicello distincte articulatum, 2–3 mm. diametro, subtiliter pubescens. *Calycis segmenta* breviter connata, ovato-triangularia, subacuminata, acuta, 2–3 mm. longa, 1.5 mm. lata, extra parce breviter pubescentia. *Corolla* subcylindrica, apicem versus leviter angustata, 5-angulata, tenera, alba, tubo 1 cm. longo 3–4 mm. lato extra minutissime puberulo et insuper secus angulos breviter glanduloso-pubescente, intus (maxime superne) minute pubescente, segmentis deltoideis acutis patenti-recurvis 1 mm. longis glabrescentibus. *Filamenta* angustissime linearia, applanata, 3–4 mm. longa, vix 0.3 mm. lata, crispule pubescentia, basi in dilatationem rotundato-quadrata circiter 0.6 mm. diametro subito expansa. *Antherae* leviter cohaerentes, anguste lanceolatae, 5 mm. longae, filamento dorsaliter basifixae eique 1 mm. adnatae, thecis basi rotundatis et brevissime cornutis, rostris tenerrimis flexilibus ut videtur planis dorso calcaratis, antherarum alternarum calcaribus adscendentibus et deflexis minutissime vel vix papilloso-scaberulis. *Stylus* filiformis, 9–10 mm. longus, glaber, stigmatibus parvo subdisciformi pallido medio depresso. *Fructus* ignotus.—*Vide* Hook. Ic. Pl. 33, t. 3258 (1935), *ined.*

ASSAM. Delei valley, 28° 20' N., 96° 35' E., 1500–1800 m., 24 July 1928, F. Kingdon Ward 8479 (type, Herb. Kew.): “A small epiphytic undershrub in the forest. Flowers white. Calyx, corolla and filaments pubescent or downy.”

The verticillate branching of this species, resulting in a densely bushy habit, is unique in the genus. The fine elevate reticulation of the veins on both surfaces of the leaves is remarkably pretty.

A new type in the Series is represented by this and the next two species (which are not closely related to any hitherto described), for the rather small, pubescent, solitary or subsolitary flowers are so shortly pedicelled as to appear subsessile. If the corollas were as reduced in size as they are in *A. pilifera* or *A. obovata*, one might regard the result as the climax of reduction within the genus, and it may well be that further exploration of the prolific regions of Upper Burma and Assam will bring such a hypothetical form to light. It is possible, however, that the combination of a short corolla with a very short pedicel might be a disadvantageous one

and therefore unlikely to survive even if ever evolved, since it is noteworthy that the above-mentioned two species, which are anomalous in the possession of a much reduced corolla, have relatively very long pedicels. One may surmise that there is some biological significance in this fact, perhaps in connection with pollination: field-observations on the type of insect-visitor frequenting the flowers would therefore be of considerable interest.

Agapetes brachypoda Airy-Shaw, sp. nov., ab *A. spissa* Airy-Shaw foliis late ovatis integris utrinque subrotundatis, nervis supra impressis infra obscuris, receptaculo longe setoso, ab *A. pensili* Airy-Shaw (*vide infra*) ramis robustis parum ramosis, foliis fere duplo maioribus crassius coriaceis glaberrimis distincta.

Suffrutex parvus, patulus, interdum epiphyticus. *Rami* robusti, recti, subsimplices, usque 5 mm. diametro, dense patenti-hirsuti, innovationibus ferrugineo-hirtis. *Folia* breviter ovata usque elliptica, 1.5–2.1 cm. longa, 1–1.5 cm. lata, basi subcuneata usque rotundata, apice rotundata, apiculata, margine revoluta integerrimo vel hinc inde cilio vel vestigio denticuli minuti interrupto, crasse rigide coriacea, glaberrima, siccitate pagina superiore rugulosa, cinereo-viridia, pagina inferiore laevia, laete brunnescentia; costa et nervi supra impressi, subtus prominuli; petiolus brevissimus, 1–2 mm. longus, transverse rugosus, basi perulis lineari-subulatis setiformibus usque 3 mm. longis quasi stipulis laciniatis circumdatus; folia innovationum coccinea (teste Ward), siccitate surde rosea, margine revoluta remote ciliata. *Flores* axillares, solitarii vel bini, penduli, brevissime pedicellati; pedicelli breviter albo-pubescentes et longe subferrugineo-glanduloso-setosi, 2–4 mm. longi, paullulum supra basin bracteolis binis ovatis acutis ciliolatis et ipsa basi perulis paucis parvis brunneis membranaceis ciliolatis suffulti. *Receptaculum* obconicum, eodem modo ac pedicellus dense vestitum, 2–4 mm. diametro. *Calycis segmenta* ovato-lanceolata, 4–6 mm. longa, basi circiter 2 mm. lata, breviter acuminata, acuta, submembranacea, nervosa, indumento duplici parce vestita. *Corolla* fere stricte cylindrica, inferne levissime ampliata, alba, tenuiter roseo-vittata, tubo 1.6–1.7 cm. longo 5–6 mm. lato extra indumento duplici breviter pubescente intus basin versus parce breviter et subtiliter pubescente, segmentis triangularibus reflexis 1–2 mm. longis acutis intus minute papillosis marginibus glabrescentibus. *Filamenta* linearia, applanata, 1–3 cm. longa, 0.5 mm. lata, copiose pubescentia, basi vel paullo supra basin in dilatationem oblongam 2 mm. longam 1 mm. latam glabram abruptiuscule ampliata. *Antherae* leviter cohaerentes, anguste oblongo-lanceolatae, filamento dorsaliter basifixae eique 2–3 mm. adnatae, 6 mm. longae, vix 1 mm. latae, rostris liberis apicem versus attenuatis rigidis parte pollinifera brevioribus (2.5: 3.5 mm.), dorso supra medium calcaribus duobus papilloso-scabridis iis *A. pensilis* simillimis instructae. *Stylus* filiformis, 1–7 cm. longus, glaber, stigmatibus minuto vix expanso. *Fructus* ignotus.—*Vide* Hook. Ic. Pl. 33, t. 3257 (1935), *ined.*

UPPER BURMA. Mountains, east of Fort Hertz, 27° 30' N., 97° 50' E., 1800 m., 5 Sept. 1926, *F. Kingdon Ward* 7369 (type, Herb. Kew.): "Small spreading undershrub on rocks or trees; young foliage scarlet. Flowers white, with thin pale pink stripes."

In habit and foliage very unlike the last, in floral characters very similar, but possessing long gland-tipped hairs, in addition to the short simple pubescence, on the pedicel and calyx, as in the next species.

Agapetes pensilis *Airy-Shaw*, sp. nov. *A. brachypodae* *Airy-Shaw* affinis, sed multo gracilior, foliis fere duplo minoribus saltem infra breviter pilosis.

Suffrutex epiphyticus, scandens, a ramis arborum longe pendulus, ramosissimus. *Caules* graciles, 1-2 mm. crassi (vetustiores usque 3 mm.), dense et longiuscule brunneo-pilosi, e parte basali radices napelliformes usque 3.5 cm. longas emittentes. *Folia* parva, ovata usque elliptico-oblonga, 1-1.6 cm. longa, 0.5-1.1 cm. lata, basi angustato-rotundata, apice obtusa usque subacuta, apiculata, margine integerrimo leviter revoluta pauciciliata vel fere eciliata, utraque pagina pilis paucis brevibus aegre visibilibus conspersa (sed folia innovationum plus minus dense pubescentia), siccitate supra surde viridia, rugulosa, subtus pallidiora, plana, coriacea, costa et nervis supra impressis subtus obscurissimis; petiolus vix 1 mm. longus vel subnullus. *Flores* solitarii vel bini, ut videtur parvis editi, subsessiles, pedicello 1-2 mm. longo. *Receptaculum* turbina- tum, circiter 2 mm. diametro et aequilongum, totum longe ac dense setoso-pilosum. *Calycis* segmenta sublibera, ovato-deltoides, cir- citer 2 mm. longa et basi subaequilata, subacuminata, acuta, dorso longe pilosa sed minus dense ac receptaculum. *Corolla* cylindrica, sursum levissime angustata, tubo 1.7 cm. longo 5-7 mm. diametro albo- et roseo-vittato, segmentis deltoides viridibus circiter 1.5 mm. longis et basi aequilatis acutis recurvis apice ipso iterum recurvo, extra longiuscule et densiuscule glanduloso-pilosa, pilis albis 1-1.5 mm. longis, glandulis fuscis oblongis, fauce breviter et sparsius eglanduloso-piloso. *Filamenta* libera, lineari-subulata, basi leviter dilatata, plana, circiter 12 mm. longa et 0.5 mm. lata, pilosa. *Antherae* leviter cohaerentes, anguste lanceolatae, 6 mm. longae, filamentis subaequilatae, circiter 1 mm. supra basin rotundatam dorsifixae, rostris liberis apicem versus subattenuatis rigidis parte pollinifera paullo longioribus subobtusis poro oblongo dehiscentibus, medio dorso calcaribus duobus papilloso-scabridis angulo recto porrectis angulo recto iterum sursum refractis totis circiter 1.5 mm. longis instructae, antherarum alternarum calcaribus porrectioribus. *Stylus* filiformis, 1.7 cm. longus, glaber, stigmatibus truncato obscure denticulato vix expanso. *Fructus* ignotus.—*Vide* Hook. Ic. Pl. 33, t. 3256 (1935), *ined.*

UPPER BURMA. Valley of the Seinghku, 28° 5' N., 97° 30' E., 2400-2700 m., 25 Sept. 1926, *F. Kingdon Ward* 7458 (type, Herb.

Kew.): "A pendent epiphyte in the upper rain forest, hanging from the boughs of large trees by the yard, or curtaining their trunks. Flowers striped pink and white with a green toothed rim. Small carrot-like water-storing tubers occur at the base, but these are very small compared with the large globular structures found on other species which grow in parts of Burma where there is a long dry season."

N. W. YUNNAN. Prope fines Tibeto-Birmanicas inter fluvios Lu-djiang (Salween) et Djiou-djiang (Irrawadi or. sup.), in jugi Tschiangschel, 27° 52', lateris occid. pluviisilva mixta temperata, substr. granitico, circiter 2800-3450 m., 5 Jul. 1916, *Handel-Mazzetti* 9352: "Frutex epiphyticus pendulus bulbos lignosos edens."

Closely allied to *A. brachypoda*, but the slender, pendent habit, and the much smaller, less coriaceous leaves, pubescent below, at once distinguish it. Dr. Handel-Mazzetti's discovery of the species in the adjacent part of Yunnan is interesting, since it indicates that some of these apparently local species may be much more widely distributed.

Agapetes sp. nov. (material insufficient for description).

ASSAM. Delei Valley, 28° 15' N., 96° 35' E., 2100-2700 m., 25 Aug. 1928, *F. Kingdon Ward* 8585 (Herb. Kew.): "A small straggling epiphytic undershrub of the forest, southern slope. In fruit."

The hirsute branches, small leaves and solitary subsessile flowers clearly place this in the neighbourhood of *A. pensilis*, *A. brachypoda* and *A. spissa*, from all of which it differs in the much thinner texture of its ovate-oblong leaves.

NUMERICAL LIST OF AGAPETES COLLECTED BY CAPT. F. KINGDON WARD, 1924-1931.

6323.	<i>praeclara</i>	8124.	<i>burmanica</i>
6710.	<i>oblonga</i>	8479.	<i>spissa</i>
6749.	<i>Forrestii</i>	8585.	sp. aff. <i>pensilis</i> , etc.
7369.	<i>brachypoda</i>	9099.	<i>adenobotrys</i>
7458.	<i>pensilis</i>	9101.	<i>pseudo-Griffithii</i>
7788.	<i>Lobbii</i>	9118.	<i>pubiflora</i>
7791.	<i>Parishii</i>	9144.	<i>pseudo-Griffithii</i>
7977.	sp. aff. <i>salicifolia</i>	9145.	<i>oblonga</i>
8021.	<i>linearifolia</i>	9153.	<i>angulata</i>
8032.	<i>macrophylla</i>	9154.	<i>pilifera</i>
8061.	<i>Forrestii</i>	10168.	<i>pubiflora</i>

III.—ON THE FLORA OF THE NEARER EAST: XVI*

MISCELLANEOUS NEW RECORDS. W. B. TURRILL.

Oxytropis thessala Turrill.

In the Kew Bulletin, 1930, 122, a new species of *Oxytropis* was described, from material collected by Dr. P. L. Giuseppi from the Thessalian Olympus, under the name *Oxytropis olympica*. Unfortunately, St. John, in Proc. Biol. Soc. Wash. 41, 103 (1928), used the name *O. olympica* for a plant from the Olympic Mountains, Washington, U.S.A. At the time the description of the Thessalian plant was prepared St. John's name had not been included for the Index Kewensis supplement then in preparation. The name *Oxytropis thessala* Turrill is herewith proposed in place of *O. olympica* Turrill non St. John.

Geum heterocarpum Boiss. in Albania.

In his Elenchus plantarum novarum minusque cognitarum, 40 (1838) Boissier describes *G. heterocarpum* from Sierra Tejada et Nevada. In his Voyage Botanique dans l'Espagne, 201, t. 58 (1839-45) he gives the species as occurring "in dumetis umbrosis praecipue Berberidis Creticae in regione alpinâ, Sierra Tejada, Sierra de la Nieve, Sierra Nevada en la Cartejuela. Alt. 5000'-6000'. Fl. Jun.-Jul." with "Hab. in Hispaniâ australi, monte Tauro Asiae minoris (Aucher)." In the "Additions et Corrections" of the same work, p. 728, he records finding the same species on the most eastern summit of Cadmus in Caria. He notes that in this material the carpels are situated together in one group, not one sessile in the calyx and the others on a "stipe," and therefore changes the name *G. heterocarpum* to *G. umbrosum*. In the Flor. Or. 2, 698 (1872) he reverts to the name *G. heterocarpum*, which is also the correct name under the present International Rules. The species also occurs in (1) W. Algeria (Dj. Morghad), E. Algeria (Touggour), and Morocco (Immuizer, Ari Benji, Aguelman-Sidi-Ali-in-Mohand)—Maire, Catalogue des Plantes du Maroc, 2, 338 (1932); (2) Dauphiné ("sous les roches calcaires de la Corniche du mont Seüse près de Gap," Rouy et Fouc. Flor. de France 6, 158: 1900); (3) Italy, Lucania, according to Bolle in Fedde Repert. Beih. 72, 44 (1933); (4) Orient: Caria, Lycia, Phrygia, Cilicia, Cappadocia, Syria, Palestine, Iraq, W. Persia, Armenia, and Transcaspia.

G. heterocarpum is the type species of the section *Orthostylus* Fisch. et Mey. (sect. *Orthurus* Boiss.) which was raised to the rank of a subgenus by Bolle (l.c. 43). Within the same section or subgenus are included *G. speciosum* N. Alboff from the western Caucasus (Abchasia, Mingrelia), and *G. kokanicum* Regel et Schmalhausen from Central Asia (Kokania) and N. Persia (see Bornmüller in Mitt. Bot. Thür. Ver. 21, 61: 1906).

The wide but discontinuous distribution of *G. heterocarpum* is a reason for supposing it to be an old relict type in the Mediterranean Region, since its occurrence at high elevations, up to 2000 m., makes it most improbable that it was accidentally introduced in recent times. Its discovery by Alston and Sandwith in the Balkan Peninsula, an area rich in Tertiary relicts, is thus of more than passing interest. In their 1933 visit to South Albania, Alston and Sandwith collected the species in the district of Gjinokastrë (Argirokastron) on the Strakavec peak of the Mali Lunxheriës range above Çajup, under a juniper bush on limestone, at 1700 m., on 13.6.1933, with pale yellow flowers, No. 1663, and from exactly the same locality in young fruit, on 12.7.1933, No. 2209.

Another matter of considerable interest is the intra-specific variation of *G. heterocarpum*. The Spanish material is fairly uniform, certainly much more so than the Oriental. On the whole it has smaller flowers, less spreading carpel indumentum, relatively longer gynophore and more marked "heterocarpy" than eastern specimens. The Albanian plants agree best with much Asiatic material, but it must be noted that some specimens from the east agree in flower size and indumentum with the Spanish plants. It may be suggested that there is here another example of a plant of eastern origin which during or after its spread westwards lost some of its genetic variability, i.e. the isolated populations of the west have a smaller gene content than the more polymorphic population of the Orient. Other explanations of the known facts are, of course, possible, and only the examination of much more material than is at present available can prove which is correct. Throughout its range *G. heterocarpum* seems to occur in the shade of shrubs or brushwood (*Berberis*, *Juniperis*) especially, if not entirely, on limestone.

Sideritis perfoliata L. Sp. Pl. 575 (1753) var. *lanata* Turrill a planta typica caulibus foliisque villosulo-lanatis praecipue differt.

Caulis dense villosulo-lanatus et pilis brevioribus glandulosis praeditus, internodiis 1.5-2.3 cm. longis. *Folia* caulina anguste oblonga, 4-5 cm. longa, 1.2-1.5 cm. lata, acuta, basi rotundata, sessilia vel brevissima et abrupte vel subabrupte petiolata, margine inconspicue dentato-crenulata, untrunque dense albo-lanata; floralia inferiora foliis subsimilia sed breviora latioraque, superiora a basi latissima ovata contracta, longe acuminata, apice fere spinulosa, circiter 3 cm. longa et 3 cm. lata, reticulato-venosa, flavido-viridia. *Calyx* 1.1 cm. longus, tubo cylindrico 7 mm. longo glanduloso-hispido, dentibus anguste triangulari-lanceolatis acuminatis 4 mm. longis longe hirsuto-barbatis. *Corolla* 11.5 mm. longa, extus superne hirsuta, inferne glabrescens, tubo basi 2 mm. fauce fere 4 mm. diametro, labio adaxiale bilobato lobis oblongis 3.5 mm. longis 1.75 mm. latis, labio abaxiale trilobato lobis lateralibus ovatis 2 mm. longis 1.5 mm. latis intermedio 2 mm. longo 3 mm. lato, lobis omnibus untrunque hispidulo-hirsutis. *Stamina* 2.5 mm.

*Continued from K.B., 1934.

longa, filamentis glabris. *Stylus* (stigmatibus inclusis) 5.5 mm. longus, glaber, ramis stigmaticis inaequalibus 1.0 et 1.3 mm. longis, concavis truncatis, ramo inferiore superiorem amplexente; ovarium 1.25 mm. altum.

SAMOTHRACE: Mt. Fengari, 1550 m., rather flat places on summit of ridge, and occasionally on rough stony slope, not common, *H. G. Tedd* 1473.

Sideritis perfoliata L. is described (Sp. Pl. 575: 1753) as "herbacea hispido-pilosa, foliis superioribus amplexicaulibus" with a subsidiary description which with the reference to Royen can leave little doubt that the Asia Minor plants named *S. perfoliata* at Kew really represent the species as intended by Linnaeus. Royen's synonyms, however, remain doubtful, especially the second, and Linnaeus describes the corallas as "albae venis aliquot rufis." The species in the sense accepted here occurs with a fairly wide distribution in western and southern Asia Minor, Syria, Palestine, the Athos Peninsula, and Samothrace. In general as traced from south to north it becomes increasingly lanate and the Samothrace plant is better considered as the final item of a series than as a sharply marked variety. The inflorescence leaves (i.e. those subtending the flower groups) particularly are much more lanate in the Samothrace plant, and to a slightly less degree in the Athos material, than in the Asia Minor, Syrian, and Palestine specimens. On the whole also the northern material shows a less marked distinction between the lower cauline and the inflorescence leaves. With increased indumentum the shortly stalked glands are much hidden on all the leaves and the stems.

Halácsy, Consp. Flor. Graec. 2, 497 (1902), records *S. perfoliata* from Thessalia: mt. Agrapha in Pindo (Heldr.) and quotes *S. pindicola* Heldr. in delt. syllog. Parn. 1900, 4. It has not been possible to see either the specimen or the publication and the Thessalian plant remains doubtful. Maire (Quatr. Fasc. Étude Pl. Vasc. Grèce, Nancy 1908, 173) also records *S. perfoliata* from the Pindus—"mont Neraïdha, audessus de Grevenoseli, calcaire, 1200-1600 m., ?Recueilli par les indigènes pour faire des infusions théiformes, no. 1940." Hayek, Prodr. Flor. Penins. Balc. 2, 257 (1929) does not account for the name *Sideritis pindicola* and records *S. perfoliata* L. only for Macedonia, presumably on the Athos specimens.

The first identification of the Athos plant as *S. perfoliata* was apparently made by Grisebach, Reise durch Rumel. u. nach Brussa, 1, 239 (1841) and Spic. 2, 144 (1844) on material collected by Friedrichsthal and preserved at Vienna. Specimens from the Athos Peninsula are at Kew, collected by Sintensis and Bornmüller 945 (1891) and by Adamović (1903). It is interesting to note that the latter were named by the collector *Sideritis althoa* Adamov., which remains apparently an unpublished manuscript name. The Athos specimens at Kew are nearly as lanate as the Samothrace specimens

and the study of more material from both localities might enable the north Aegean plants to be more definitely separated from those of Asia Minor as one variety. On the other hand, additional specimens from Asia Minor might make the known series still more continuous than it is at present.

S. clandestina was first described by Chaubard et Bory (Expéd. scient. de Morée, 170, t.20: 1832) under the name *Phlomis clandestina*. The original material came from "des hautes régions du Taygète, où il nous a paru rare, et d'où l'a rapporté M. Virlet lors de sa dernière ascension par les pentes orientales." The plate is reproduced in their Flor. peloponn. 36, t.21 (1838) with the name *Sideritis syriaca* L. but this is not the Linnean *S. syriaca*, which is a Cretan plant. Boissier and Heldreich in Boiss. Diagn. Ser. 1, 7, 58 (1846), published the name *Sideritis theezans* with a description of the same species, and in Diagn. ser. 2, 4, 32 (1859) they published *S. peloponnesiaca* as a species. The latter is now generally, and probably correctly, regarded as a variety of *S. clandestina*. Hayek Prodr. Flor. Penins. Balc. 2, 257 (1929), correctly according to the International Rules, made the combination *S. clandestina* (Chaub. et Bory) Hayek. The known geographical distribution of *S. clandestina* is Laconia: mt. Malevo, Taygetos and of the var. *cyllenea* (Boiss.) Hayek, Achaia: mt. Kyllene; mt. Chelmos; Elis: mt. Olenos; Argolis: mt. Artemision. In addition Degen, in Oesterr. Bot. Zeitschr. 16, 304, 337 (1891) has recorded the species (as *S. theezans*) from Samothrace. Degen's material has not been seen but it may be suggested that it is probably *S. perfoliata* var. *lanata*. His reference to the plant in the interpolated phrase "mit einer dicht wollig bekleideten, gelbblühenden Pflanze" supports the standpoint taken here. The Samothrace plant as represented by Tedd's material differs from *S. clandestina* in the longer lanate indumentum, in the shorter internodes of the flowering stems, in the sessile or very shortly petiolate leaves which are generally shorter or broader or both, the smaller flowers, and the glandulose hispidulous calyx-tube.

S. scardica Griseb. has been fully considered in Hooker's Icones Plantarum, t.3157 (1932). With the present distribution of the mainland around the northern part of the Aegean Sea it is approximately intermediate in geographical distribution between *S. clandestina* and *S. perfoliata*, except for Halácsy's and Maire's records of the latter species from the Pindus.

IV--MISCELLANEOUS NOTES.

Royal Horticultural Society Honours to Kewites.—The following Kewites appear in the recently published list of Royal Horticultural Society honours:—

Victoria Medal of Honour.—Sir Arthur W. Hill, K.C.M.G., F.R.S., Director, Royal Botanic Gardens, Kew; Mr. W. Hales, A.L.S., Curator, Physic Garden, Chelsea.

Associateship of Honour.—Mr. S. W. McLeod Braggins, Superintendent, La Mortola, Italy; Mr. C. P. Raffill, Assistant Curator, Royal Botanic Gardens, Kew.

NICHOLAS EDWARD BROWN.—Dr. N. E. Brown was born at Redhill, Surrey, on July 11th, 1849. He died peacefully on November 25th, 1934, at his residence in The Avenue, Kew Gardens, after a few months' illness, retaining all his faculties to the last. He was buried at Richmond Cemetery on November 29th in the presence of many of his former colleagues and friends.

Brown was educated at the Grammar School at Reigate, and on leaving was employed by Mr. William Wilson Saunders, F.R.S., F.L.S., to act as Curator of his museum in the same town. At that time Mr. Saunders was one of the leading naturalists in England, and a most liberal amateur horticulturist. He produced and edited the *Refugium Botanicum*, or "Figures and Descriptions, from living specimens, of Little Known or New Plants of Botanical Interest." This work ran into five volumes, from 1869 to 1873, and was devoted chiefly to succulent plants generally, bulbous plants of various families, Orchids, Aroids, Bromeliads, *Geraniaceae*, etc., the very plants in which Brown ever afterwards retained a keen interest and on which he was regarded as the chief authority. These volumes appeared during Brown's curatorship of Mr. Saunders' museum, and it was natural that so promising a botanist as he must have then shown himself to be should migrate to Kew, for Mr. Saunders had enlisted the help of Mr. J. G. Baker and Mr. W. H. Fitch, who were responsible for the descriptions, and for the figures and dissections respectively, whilst the celebrated orchid specialist of the day, Professor H. G. Reichenbach, of Hamburg, contributed the accounts of the orchids. Thus Brown had the great advantage, at the threshold of his career, of being closely associated with the leading botanists of the time. That he retained a lively interest in these five volumes of his employer seems clear, for his pencil emendations are numerous on the Kew copy, which no doubt explains why Reichenbach used to speak of him as his "lynx-eyed little friend."

In February 1873 Brown, at the age of 24, was appointed Assistant in the Herbarium at Kew, and, although of poor physique and often in indifferent health, he has outlived all his colleagues of that time. In 1874 he commenced lecturing on geographical botany, which brought him into contact with successive generations of student-gardeners, and it is in this connection that many such remember him best. His portrait appeared in the *Kew Guild Journal* for 1904. Horticulture, as well as botany, owes a good deal to Brown. From 1876 to 1886 he compiled the annual lists of new plants in "Hogg's Gardeners' Year Book," and when that publication ceased he prepared similar lists for the "*Kew Bulletin*," a task later handed on to his colleague, Mr. S. A. Skan. He was concerned

with the compilation of that useful work, "*Johnson's Gardeners' Dictionary*," and during nearly the whole of his life was a valued contributor to the "*Gardeners' Chronicle*."

Brown's contributions to botany were many and varied. In 1886 he completed the last volume (vol. 12) of Syme's "*English Botany*," some of the plates being from his own brush, and he published a supplement to vols. 1-4 in 1892. After this his official duties diverted his energies into tropical botany. He became intensely interested in the floras of Tropical and South Africa, especially the latter, and he possessed an unrivalled knowledge of the geography of Africa. He checked the whole of the records of localities after the resuscitation of the "*Flora of Tropical Africa*" and the "*Flora Capensis*" under the editorship of Sir William Thiselton-Dyer, his help being gratefully acknowledged in the preface to each volume.

In 1892 he contributed his first description to the *Decades Kewenses* and to the *Diagnoses Africanæ*, under the titles of which he has published descriptions of very many new species. Most of the papers in the early volumes of the "*Kew Bulletin*" were unsigned, but Brown's name appeared in 1894 with an account of "*Tuberous Labiatae*." From 1896 to the time of his retirement in 1914 Brown was occupied mainly with the flora of Africa. Besides checking the geographical records mentioned above, he elaborated some of the most difficult families. He did a portion of the *Orchidaceae* for vol. 7 (1898) of the "*Flora of Tropical Africa*," and for the remainder of that work the following families, most of them entailing much laborious and careful dissection:—*Pontederiaceae*, *Xyridaceae*, *Typhaceae*, *Araceae*, *Eriocaulaceae*, *Mayacaceae*, *Asclepiadaceae*, *Gentianaceae* (with J. G. Baker), and for vol. 6 the troublesome genus *Euphorbia*, his account of this occupying 158 pages. With reference to this the editor says in the preface "Mr. N. E. Brown, A.L.S., who finds a peculiar fascination in the study of succulent plants, the difficulties of which most botanists find deterrent, undertook the genus *Euphorbia*." His most important separate paper on the African flora was his "*List of Plants collected in Ngamiland and Northern Kalahari Desert by Major E. J. Lugard, D.S.O.*" (*K.B.* 1909, 89-146), most of his determinations having stood the test of time and revision.

In 1915 he published in the *Kew Bulletin* a valuable monograph of all the known species of *Sansevieria*, and the year before that "*Notes on the genera Cordyline, Dracaena, Pleomele, Sansevieria and Taelsia*."

Without Brown's help the "*Flora Capensis*" might even now be unfinished, for he contributed very largely to its pages. In vol. 7 he described the same monocotyledonous families as he had done for the *Tropical Flora*; for vol. 5, pt. 1, he did part of the *Labiatae*; for vol. 4, pt. 1, the *Asclepiadaceae* (occupying 518 pages), and the smaller genera of *Ericaceae* (103 pages); and in addition he helped

to complete the account of *Erica* by Guthrie and Bolus, the former dying during its preparation, and the latter having to give up the work owing to indifferent health. At the close of his official connection with Kew, Brown worked out the genus *Euphorbia* (155 pages) and the family *Urticaceae* for the same Flora. His contributions to our knowledge of all these intricate families may be described as models of critical and thorough work.

Brown was also entrusted with the enumeration of the very important collection of plants made on Mt. Roraima in British Guiana by McConnell and Quelch (Trans. Linn. Soc. ser. 2, 6, 18-107, with 14 plates, the analyses by N. E. Brown), and after his retirement worked out some South American collections for the New York Botanical Garden.

Of late years Brown made a critical study of the large genus *Mesembryanthemum*, and has divided it into a very great and perhaps excessive number of smaller genera, published mainly in the "Gardeners' Chronicle." He also collaborated with A. Tischer and M. C. Karsten in producing a book entitled "*Mesembryanthema*," with descriptions in English, German and Dutch, and edited by E. J. Labarre (L. Reeve & Co., 1931). He grew many of these plants in his small greenhouse, and it is satisfactory to record that they have now been added to the Kew collection. He assisted Dr. Burt Davy with portions of the "Flora of the Transvaal," and recently worked a good deal at the South African *Iridaceae*, including a critical review of those of Thunberg's herbarium (Journ. Linn. Soc. Bot. 48, 15-55: 1928). He was always keen to see Thunberg's specimens on which so many South African species are based, and he published notes on *Aloe* and *Mesembryanthemum* as represented in that herbarium.

Besides his botanical work Brown was a keen microscopist, and was a member of the Quekett Microscopical Club. In the Club's journal for 1914 he published "Some Notes on the Structure of Diatoms," and in 1920 in the "English Mechanic" a paper on "Some New and Old Antarctic Diatoms," whilst only last year, when 84 years of age, he brought out a small book containing an account of *Arachnoidiscus*, a genus of diatoms, consisting of 88 pages of descriptive matter and 7 plates (W. Watson & Sons, Ltd., London).

Brown was promoted to be Assistant Keeper of the Herbarium in 1909. He was elected an Associate of the Linnean Society in 1879, and in 1921 was awarded the Captain Scott Memorial Medal by the South African Biological Society in recognition of his work on the South African Flora. In 1932 the University of the Witwatersrand, Johannesburg, conferred on him the Honorary degree of Doctor of Science, the Director performing the ceremony at the herbarium in the presence of the staff (K.B. 1932, 155). A little before his death he was actually engaged on a monograph of the genus *Conophytum*, for which he had prepared a number of beauti-

fully executed coloured plates and dissections, for he was a very good botanical artist and could use colour with delicate effect. In his younger days he drew many of the plates for Mr. C. B. Clarke's "Illustrations of Cyperaceae."

Dr. Brown's taxonomic work was of a very high standard, and he paid great attention to small details. As the herbarium sheets show everywhere he was very critical, indeed almost hypercritical, in specific determinations. If anything were wrong with a drawing, a description or a determination in the herbarium, Brown would be sure to find it out. He could "spot" the family and genus of most plants, and was always very helpful to younger colleagues like the writer, who never appealed to him in vain. Although something of a recluse and chained to his science, whereby he accomplished much more than the average worker, Brown had a strong sense of humour and loved to "crack a joke." Even his pencil notes on the herbarium sheets show this. One, which he was fond of showing to visitors, is attached to a specimen of *Lecythis* from Demerara (Jenman 4155) named by J. G. Baker. On this sheet C. B. Clarke had written "Does this fruit really belong?" to which Brown had replied "This 'fruit' is a spider!" And so it is!

J. HUTCHINSON.

Plants in Flower on Christmas Day, 1934.—The following is a list of 103 plants which were in flower outside at Kew on Christmas Day, 1934. It is of interest to mention, by contrast, that the previous Christmas only one plant was in flower, namely *Jasminum nudiflorum*.

Abutilon vexillarium, *Anthemis Cupaniana*, *Arbutus Andrachne*, *A. andrachnoides*, *A. Unedo* varieties, *Armeria fasciculata*, *A. pungens*, *Bellis perennis* fl. pl., *Bergenia ligulata* var. *speciosa*, *Buddleja suriculata*, *Camellia nobilissima*, *C. Sasanqua*, *C. Sasanqua* var. *alba*, Carnations, *Ceanothus Burkwoodii*, *Cheiranthus Cheiri* varieties, *Chimonanthus fragrans*, *C. fragrans* var. *grandiflorus*, *Clematis balearica*, *Colchicum libanoticum*, *Crataegus monogyna* var. *praecox*, *Crinum Moorei*, *Crocus Imperati*, *C. laevigatus*, *Cydonia lagenaria* (japonica), Daisies on lawns, *Daphne Laureola* var. *Philippii*, *D. Mezereum*, *D. Mezereum* var. *alba*, *Dianthus japonicus* var., *Dimorphotheca Barberiae*, *Erica carnea* varieties, *E. darleyensis*, *E. lusitanica*, *E. mediterranea*, *E. vagans* var. *grandiflora*, *E. Veitchii*, *Erodium Mourettii*, *Euphorbia biglandulosa*, *Forsythia suspensa*, *Fraxinus angustifolia*, *Galanthus byzantineus*, *G. Elwesii*, *Gerbera Jamesonii*, *Hamamelis japonica* var. *flavo-purpurascens*, *H. mollis*, *Helianthemum vulgare* var. (very few flowers), *Helleborus abschasicus*, *H. corsicus*, *H. cyclophyllus*, *H. foetidus*, *H. niger*, *H. odoratus* var. *purpurascens*, *H. orientalis*, *H. viridis* var. *purpurascens*, *Iberis Jordani*, *I. semperflorens*, *I. sempervirens*, *Iris unguicularis*, *I. unguicularis* var. *alba*, *Jasminum nudiflorum*, *J. primulinum*,

Kniphofia rufa, *Lonicera fragrantissima*, *L. Standishii*, *L. Standishii* var. *lancifolia*, *Mathiola incana*, *Parachetus communis*, *Petasites fragrans*, *Polyanthus*, *Potentilla splendens*, *Primula helodoxa*, *P. megascifolia*, *P. vulgaris* (and coloured varieties), *Prunus subhirtella* var. *autumnalis*, *Ranunculus millefoliatus*, *Rhododendron dauricum*, *R. dauricum* var. *sempervirens*, *R. lapponicum*, *R. Nobleanum*, "Mauve Queen," *R. mucronulatum*, *R. mucronulatum* var. *acuminatum*, *R. parvifolium*, *Rosa indica* var. *minima* and "Monthly Roses," *Salix Mendemii*, *Saxifraga Kellereri*, *Schizostylis coccinea*, *Senecio Crustii*, *Spiraea Thunbergii*, Stocks, *Veronica angustifolia*, *V. Cookiana*, *V. salicifolia*, *V. speciosa* varieties, *Viburnum fragrans*, *V. shensianum*, *V. tomentosum* Lanarth var., *V. Tinus*, *V. rhytidophylloides*, *V. rhytidophyllum*, *Viola* (winter-flowering hybrids).

Hooker's Icones Plantarum.*—Part 2 of vol. 3 of the fifth series was published in November last and contains 25 plates in black and white, each showing dissections, together with full descriptions and notes, of rare or little-known plants, 10 being new to science.

The first four plates are based on material collected by Messrs. Alston and Sandwith during their expeditions to South Macedonia and Albania in 1932 and 1933. *Silene Asterias* Griseb. (t.3226) is a very distinct species with a long-pedunculate capituliform cyme of deep crimson flowers, and is endemic in the central parts of the Balkan Peninsula. An origin by ecotypical segregation from the more widely dispersed *S. compacta* Fisch. is postulated. *S. ventricosa* Adamović (t.3227) is a dioecious species allied to *S. Roemerii* Friv. and *S. Sendtneri* Boiss. and together with them forms a group of species not sharply distinguishable from one another. *Lychnis subintegra* (Hayek) Turrill, status novus (t.3228), is based on *L. Flos-cuculi* Linn. subsp. *subintegra* Hayek; the collectors state that it is very distinct in the field from *L. Flos-cuculi*, with which they never found it associated. *Stachys serbica* Panč. (t.3229) is endemic in the central region of the Balkan Peninsula and is a native of the natural open woodlands, whose destruction by man may account for its relative rarity.

Three Australian grasses are illustrated:—*Homopholis* C. E. Hubbard (t.3231), a monotypic genus recently described from Queensland and allied to *Leptoloma* Chase; *Oryza australiensis* Domin (t.3232), a wild rice of perennial habit from Northern Australia and Queensland; and *Lepturus geminatus* C. E. Hubbard (t.3233), a new species allied to *L. repens* R. Br. A key is given to the four species of *Lepturus* so far recorded from Australia.

* Hooker's Icones Plantarum; or figures, with descriptive characters and remarks, of new or rare plants, selected from the Kew Herbarium. Fifth series. Edited for the Bentham Trustees by Sir Arthur W. Hill, K.C.M.G., Sc.D., F.R.S., Director, Royal Botanic Gardens, Kew; Honorary Fellow of King's College, Cambridge. Vol. 3, part 2 (London, Dulau & Co., 1934). Price 10s.

Sorghum dimidiatum Stapf (t.3234) is an interesting species from the Sudan. A remarkable morphological character is found in the lower glumes of the sessile spikelets: whereas the upper half of the glume is thin and chartaceous, the lower half is much thickened and cartilaginous. Most of the species of *Sorghum* have 20 (=2n) chromosomes, while *S. halepense* has 40; *S. dimidiatum*, on the other hand, belongs to a small group of about 8–10 species spread from the Transvaal to the Sudan, India, China, Malaya and Australia, the three species of which hitherto examined cytologically have only 10 chromosomes.

Botrychium chamaeconium Bitter et Hieron. ex Bitter (t.3235) is a tropical African fern so far recorded only from the Cameroons Mountain and Mt. Elgon, Uganda, though it will probably be found in other mountain masses in tropical Africa.

Five species of tropical African orchids are included:—*Cynorchis parva* Summerhayes (t.3236), which extends from French Guinea to British Cameroons; *Habenaria Tweedieae* Summerhayes (t.3237), from Kenya Colony and Uganda; *Platycoryne megalorhyncha* Summerhayes (t.3238), a native of Southern Nigeria; *P. ambigua* (Kraenzl.) Summerhayes (t.3239), from Tanganyika Territory; and *Satyrium fimbriatum* Summerhayes (t.3240), endemic in Kenya Colony, but most closely allied to *S. membranaceum* and *S. princeps* from the Cape Province of South Africa.

Three new species of *Crotalaria* § *Sphaerocarpaceae* are described from Northern Rhodesia: *C. annua* Milne-Redhead (t.3243), *C. praecox* Milne-Redhead (t.3244) and *C. streptorrhyncha* Milne-Redhead (t.3245). *Bolusia resupinata* Milne-Redhead (t.3246) is a very remarkable Leguminous plant from the same country; the flowers are inverted owing to the bending back of the pedicels of the solitary flowers, and the carina, which is spirally coiled, is 2 inches long when straightened out. The genus *Bolusia* appears to be closely related to *Crotalaria* subsection *Stipulosae*, and has accordingly been transferred from the tribe *Galegeae*, in which it was originally placed by Bentham, to the *Genisteae*.

Two new species of *Leguminosae*, *Nissolia Hintoni* Sandwith (t.3248) and *Platymiscium lasiocarpum* Sandwith (t.3249), are described from the Temascaltepec district of Mexico, where they were discovered by Mr. G. B. Hinton, whose collections in this district already amount to over 6500 numbers.

Other plants described and figured are: *Micromeria formosana* Marquand, sp. nov. (t.3230), the only representative of the genus in Formosa; *Ixora hippoperifera* Bremekamp, sp. nov., from the Cameroons, a Rubiaceae shrub with remarkable saddlebag-shaped pouches at the base of the leaves, probably in connection with myrmecophily (t.3241); *Pygmaeothamnus concrescens* Bullock (t.3242) a native of grassland in Tanganyika Territory; *Rhadamanthus urantherus* R. A. Dyer, sp. nov., (t.3247), a bulbous plant from the Cape Province, South Africa, with anthers dehiscing by pores; and *Rhynchospora confusa* Ballard (t.3250), a perennial plant from

Goyaz, Brazil: this last was originally made the type of an independent genus *Syntrinema* Radlk. et H. Pfeiff., partly on the ground of characters which had been inadvertently taken from another genus of *Cyperaceae*, namely *Chorisandra*.

Gardening in East Africa.*—This attractive and practical handbook has been published, primarily to meet the needs of the horticultural community in East Africa, but also to be of assistance to all amateur horticulturists in the sub-tropics. Although written expressly for amateurs, there is much in it that will appeal, and be of assistance, to the professional gardener.

The editor, Dr. Jex-Blake, has had the assistance of several government officials as well as members of the Kenya Horticultural Society. Considering the number of contributors, it is surprising how uniform it is—a happy result of co-operation between the editor and his co-workers.

There are twenty chapters, including such subjects as climatic conditions, soil and tillage, propagation, annuals and perennials, flowering trees and shrubs, climbing plants, lawns, vegetables and fruit, and insect pests and diseases—an ever-present menace wherever horticulture is practised.

The contributors have in every case dealt with their subjects in a clear, concise and practical manner. Where all are so good it seems invidious to draw attention to any particular chapter or chapters, but one would like to mention specially those dealing with indigenous plants—so often neglected in gardens—and with climate, soil and cultivation. Particulars of the climatic conditions are of prime importance, not only to the intending planter, but also to anyone at home who is called upon to give advice and furnish lists of plants that are likely to succeed in any particular part of the tropics or sub-tropics. The chapter on "Gardens at the Coast" is valuable as showing what can be done under very difficult soil and climatic conditions, while that on "Gardening in Uganda" indicates clearly the difference between conditions obtaining there and in Kenya.

The book is well printed on good paper and there are six coloured illustrations of native plants, including an attractive "landscape portrait" of *Spathodea nilotica*, the Uganda flame tree. The foreword by Sir Arthur Hill is one which all who are interested in the cultivation of plants should "read, mark, learn and inwardly digest."

* By Members of the Kenya Horticultural Society and of the Kenya and Uganda Civil Services. Edited by A. J. Jex-Blake, M.D. (Oxon.), F.R.C.P. (Lond.). With a Foreword by Sir Arthur W. Hill, K.C.M.G., F.R.S., Director of the Royal Botanic Gardens, Kew. Longmans, Green & Co., 1934. Pp. xvi+330, 6 coloured plates. Price 12s. 6d.

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BULLETIN OF MISCELLANEOUS INFORMATION

No. 2 1935

Errata

In K.B. no. 4, 1934, p. 167—When publishing the name *Arisaema convolutum* C. E. C. Fischer for a S. Indian plant, its earlier use for a Corean plant by Nakai in Bot. Mag. Tokyo, **43**, 543 (1929) was overlooked. The name *A. tuberculatum* C. E. C. Fischer is here proposed for the Indian species. C. E. C. FISCHER.

In K.B. no. 1, 1935, 29, line 14, before "non Hook. fil." add "A.M. et J. M. Cowan, Trees W. Beng. 80 (1929)."

In loc. cit. 30, line 1, for "This is the only species . . ." read "This and *A. saligna* (Hook. f.) Hook. f. are the only species . . ."

In loc. cit. 32, line 3 from bottom, for "*Brandisii*" read "*Brandisiana*."

In loc. cit. 44, line 18, for "Diels" read "W. E. Evans."

Other alternative solutions of the same problem, based on conflicting nomenclatural views. They are all brought forward with the desire to perfect the International Rules in the interests of botanical research. Nomenclature is a means to an end, not an end in itself.

Many of the motions consist of small but significant textual amendments, which obviously could not be published until the precise text of the International Rules was known. An English version of the Rules was issued in advance in the Journal of Botany for June 1934, but the third edition, containing the official text, did not appear until February 1935. Hence the delay in the publication of the present proposals. T.A.S.

PROPOSALS.

(1) Art. 2, line 7. That the word "especially" be inserted before "in future nomenclature."

Remarks. The present wording gives the impression that the Recommendations are concerned solely with future nomenclature,

which is not the case. Rec. XLIII, for example, applies also to names already published. T. A. SPRAGUE.

(2) Art. 14: in line 2 delete "modification or," and replace the second use of the word "modification" by the word "sub-division."

Argument. The present wording is not uniform; the alteration suggested conforms with the French text. A. J. WILMOTT.

(3) Art. 19. Add:—"The works listed in Appendix IX, in which works nomenclature contrary to or in conflict with that legitimised by these Rules is used, are to be regarded as not validly published, although they appeared subsequently to the dates given in Art. 20."

Argument. These works include those in which "multi-verbal names" are used for species, concerning which a proposal was made to the last Congress. The issue was somewhat confused there by the fact that the motion was changed in an endeavour to meet certain objections, which resulted, however, in misunderstandings. The present proposal is framed in such a way as to provide a mechanism under the Rules by which any work can be rejected if it is found to create undesired difficulties to the smooth operation of the Rules. The reasons for inclusion of certain works suggested for the Appendix are given with the lists.* A. J. WILMOTT.

(4) Art. 20. That the following paragraph be added at the end of the Article:—"The two volumes of Linnaeus, *Species Plantarum*, ed 1 (1753), which appeared in May and August, 1753, respectively, are treated as having been published simultaneously on the former date."

Example. "The generic names *Thea* L. Sp. Pl. ed. 1, I. (May 1753) and *Camellia* L. Sp. Pl. ed. 1, II. (Aug. 1753) are treated as having been published simultaneously in May, 1753. Under Art. 56, the combined genus bears the name *Camellia*, since Sweet (Hort. Suburb. Lond. 1818, 157), who was the first to unite the two genera, chose that name citing *Thea* as a synonym."

Remarks. The above additional paragraph is proposed not so much to settle the question as to whether the generic name *Thea* or *Camellia* is to be adopted for the combined genus, but in order that a decision should be reached as to whether the two volumes of the *Species Plantarum* should be regarded as having been simultaneously published. If strict priority is adhered to, *Thea* is the correct name for the genus, as pointed out by Rehder in Journ. Arnold Arb. V (1924) 238.

* See proposal No. (42).

Under Art. 20, generic names which appear in L. Sp. Pl. ed. 1 (1753) are associated with the descriptions given in L. Gen. Pl. ed. 5 (1754), so that these *two works* are treated as one for the purpose of the starting-point of nomenclature, although they actually appeared in different years. The *two volumes* of the *Species Plantarum* were treated as inseparable parts of one work until comparatively recently when it was discovered by B. D. Jackson (Journ. Bot. 1923, 174) that the second volume appeared three months later than the first.

Since legitimate botanical nomenclature actually starts with particular *works* of Linnaeus which themselves appeared in different years (1753 and 1754) but are for nomenclatural purposes regarded as both dating from 1753, it is inconsistent to allow nomenclatural priority to the first volume of *Species Plantarum* which appeared only three months before the second. M. L. GREEN.

(5) Art. 20. For "at the following dates" read "with the following works."

Remarks. At present there is some difficulty in interpreting (f) Fungi caeteri, 1821-32 (Fries, *Systema mycologicum*), which will be removed if it is clear that the work is the important point (see *Trans. Brit. Mycol. Soc.* XVIII (1934) 314. For the alternative view see C. W. Dodge in *Ann. Missouri Bot. Gard.* XXI (1934) 709.) The *Elenchus Fungorum* was published in 1828 and was re-issued in 1830 as a supplement to the *Systema*. The *Elenchus* should be regarded as part of the *Systema*. See *Trans. Brit. Mycol. Soc.* XVIII (1934) 316. J. RAMSBOTTOM.

(6) Rec. IX for "are designated preferably by" read "are preferably taken from."

Argument. The existing formulation would appear to require *Polygonaceaeales*, and not *Polygonales*. Discussion of these minor matters was waived at Cambridge owing to the Chairman's ruling that they should be left for correction by the Editorial Committee. A. J. WILMOTT.

(7) Art. 23. Replace the first sentence by the following:—"Names of families (*familiae*) are formed from the accepted name of the type-genus by adding the suffix *-aceae* to the stem of the generic name."

Argument. See under Art. 24.

A. J. WILMOTT.

(8)* Art. 23. Alter the wording to read: "Names of families

* No. (8) is proposed if No. (7) and (9) are rejected.

are taken from the name or ancient name of one of their present genera, and end in *-aceae*."

Argument. The present wording permits the retention of a family name after the genus from whose name it was taken has been removed to another family. The suggested wording is probably what was intended.

Note. The French text retains the old erroneous form which was responsible for the change suggested by the British Sub-committee, for as it stands it would seem to require the use of such forms as *Salixaceae*, and not *Salicaceae*. A. J. WILMOTT.

(9) Art. 24. Replace the first sentence by the following :—" Names of sub-families (*subfamiliae*) are formed from the names of their type-genera by adding the suffix *-oideae* to the stem of the generic name; similarly those of tribes (*tribus*) by adding the suffix *-eae*, and of sub-tribes (*subtribus*) by adding *-inae*."

Argument. These proposals put forward at the last Congress by the British Sub-committee are suggested again for the following reasons. The examples here given indicate the need for changing the existing loose wording of the Rules concerned.

The name of a family of Diatoms is *Chaetoceraceae* (original spelling) or *Chaetocerotaceae* (orthographically correct form). Under the present working of Art. 23 the less correct form must be used, whereas the form of words used by the British Sub-committee was chosen to enable the correct forms to be used. This avoids the necessity of memorising all legitimate incorrect forms. Under the present Rules it would be possible to have one form valid (with its correct ending) for the name of the family and the other equally valid for a similar name of a sub-family.

Euodiaceae, the name of another family of diatoms, is taken from *Euodia* Bailey 1861. It has been shown that *Euodia gibba* Bailey 1861 is *Hemidiscus cuneifolia* Wall 1860, and the name *Euodia* lapses into synonymy. It seems undesirable in such circumstances to retain *Euodiaceae* as the name of the family.

One solution might be to propose *Euodia* for conservation, but *Euodia* Bailey was invalid owing to the existence of *Euodia* Forster 1776 (Char. Gen. 13 t. 7). If the name of the family must by Rule be formed from a valid generic name included in the family, any disharmony is avoided.

A. J. WILMOTT.

(10) Rec. X. That the following be inserted after Rec. X g : " Rec. X h. To give a feminine form to all personal generic names, whether they commemorate a man or a woman."

Remarks. See observations under no. (29). FR. VERDOORN.

(11) Art. 31 : (2) Example of a sexual hybrid : delete the " S." before *Lycopersicum*.

Argument. This example must be made uniform with those of sexual hybrids. As we are dealing with a " formula " it seems undesirable to repeat the generic name. But if the generic name is not repeated the formulation of the rule is slightly inaccurate.

A. J. WILMOTT.

(12) Art. 43. Interchange the comma at the end of the second line with the semicolon in the third line.

Argument. As punctuated at present the Rule is ambiguous in the English text ; cf. the French text.

A. J. WILMOTT.

(13) " Art. 47 bis. When a name, which is neither *nomen dubium* nor *nomen confusum* (see Art. 63 & 64) has become a source of confusion or error owing to its use with different meanings (*nomen ambiguum*), its use must be precised by the additional citation responsible for the usage which is at the time being employed."

Argument. This was the substance of a proposal which I originally made to the British Sub-committee. It is scarcely necessary to reject a name or epithet which, possibly through no fault of the original author other than insufficiency of description (a fault shared by many names not ambiguous at any time), has been variously interpreted by subsequent authors. All that is required is a form of citation which permits a clear indication of the usage actually employed by a writer during the period, sometimes comparatively short, when diverse interpretations are being upheld. The example of *Rosa villosa* L. appears to be more properly dealt with by citation of an emending author, as under Art. 47. The object of this proposal was to make clear the distinction between those cases where the confusion was made in the original publication—cases often without any satisfactory solution (the true *nomina confusa*)—and the mere *nomina ambigua* where there was no original confusion but only subsequent disagreement.

A. J. WILMOTT.

(14) Art. 49. In the first sentence delete all after " followed " and insert instead " by an indication of the original use of the name or epithet." In the examples, for "*Medicago orbicularis* (L.) All." read "*Medicago orbicularis* (L.: *M. polymorpha* var.); for "*Aspalathoides* (DC.) K. Koch" read "*Aspalathoides* (DC.: *Anthyllis* sect.) " ; for "*Pyrus* sect. *Aria* (Pers.) DC." read "*Pyrus* sect. *Aria* (Pers.: *Sorbus* sect.) ; for "*Matthiola tristis* (L.) R. Br." read "*Matthiola tristis* (L.: *Cheiranthus* sp.)."

Argument. This proposal is put forward as a solution of the difficulties arising from Art. 54, last sentence. These difficulties appear to be due to the admixture of taxonomy (change of rank, reclassification) with nomenclature, which does not need the citation of a second author for the attainment of precision. In Zoology it has

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not been found necessary to cite a second author. The precision is obtained by the citation of the author on whose publication the type depends.

The citation of a second author may assist in the determination of later homonyms, but the loss of this advantage may be much more than balanced by the gain in simplicity and the avoidance of the trouble under Art. 54.

A. J. WILMOTT.

(15) Rec. XXXII ter. When citing a wrong identification, the name of the group and its author should be placed between inverted commas, followed by the name of the author who misapplied it.

Example. "*Tulipa Borszczowi* Regel" Baker in Bot. Mag. t.6635 (1882), a synonym of *Tulipa Kolpakowskiana* Regel.

Remarks. This method of citation at once distinguishes a misidentification from a later homonym.

W. T. STEARN.

(16) Art. 54 line 7. The second paragraph to read:—"When on transference to another genus, the specific epithet has been applied erroneously in its new position to a different plant, the combination must be retained for the plant on which the epithet was originally based and must be attributed to the author who first correctly used the combination for the right plant. The incorrect use must not be treated as an earlier homonym."

To the examples add at end after "epithet":—" *Tsuga Mertensiana* (Bong.) Sargent [non Carrière in errore.]"—see Journ. Bot. Suppl. 1934, p. 20.

J. RAMSBOTTOM.

(17) Art. 54. That the second paragraph should read as follows:—"When the specific epithet, on transference to another generic name, has been applied erroneously in its new position to a different species, the new combination must be retained for the plant on which the epithet was originally based."

Example. The specific epithet of *Pinus Mertensiana* Bong. was transferred to *Tsuga* by Carrière, who, however, erroneously applied the new combination *Tsuga Mertensiana* (Bong.) Carr. to another species of *Tsuga*, namely to *T. heterophylla* (Raf.) Sarg. as is evident from his description: the combination *Tsuga Mertensiana* (Bong.) Carr. must be retained for *Pinus Mertensiana* Bong. when that species is placed in *Tsuga*; the citation in parenthesis (under Art. 49) of the name of the original author, Bongard, indicates the type of the epithet. If desired the words "em. Sarg." may be added (under Art. 47).

Remarks. The text of Art. 54, paragraph 2, is ambiguous, since it does not make it clear to whom the accepted combination

is to be attributed, whether to the original author of the combination who misapplied it, or to the first subsequent botanist who applied it "correctly." Under Art. 47, however, "an alteration of the diagnostic characters or of the circumscription of a group does not warrant the citation of an author other than the one who first published its name. When the changes have been considerable, an indication of their nature, and of the author responsible for the change is added." Hence it is not permissible to *replace* Carrière's name by that of Sargent as the author of the combination *Tsuga Mertensiana* (Bong.) published by the former, though Sargent's name may be appended as an emending author, the correct full citation in that case being *Tsuga Mertensiana* (Bong.) Carr. em. Sarg.

The view that a combination should be attributed to the first author who applied it *correctly* is open to very grave objections. Priority of publication is one of the most important general principles on which the Rules are based (Art. 16). The importance of the *date* of publication is shown by the fact that an entire section of the Rules (section 6, Art. 37-45) is devoted to it. Since differences of taxonomic opinion frequently arise as to the "correct" application of a name, the effect of ascribing the new combination to the first author who applied it "correctly" would be to make the date of publication either uncertain or a mere matter of taxonomic opinion.

The case of *Daphnopsis americana* (Mill.) is instructive. This combination was based by J. R. Johnston (Proc. Boston Soc. Nat. Hist. xxxiv. 242: 1909) on *Laurus americana* Mill. (1768). Under the type-method, *Daphnopsis americana* (Mill.) J. R. Johnston is strictly synonymous with *Laurus americana* Mill., the "(Mill.)" indicating the type of the epithet. This is not affected by the fact that Johnston, rightly or wrongly, cited *Daphne tinifolia* Sw. and *Daphnopsis tinifolia* Griseb. in synonymy, and cited also a specimen (no. 257) which he had collected on Margarita Island. Urban (Arkiv för Botanik, xvii. no. 7, 44: 1921) stated that the specimen cited by Johnston was not *Daphnopsis americana* (Mill.) J. R. Johnston, but *D. caribaea* Griseb., but he did not think it necessary on that account to reject J. R. Johnston as the author of the combination, but merely added "(excl. specim.)" to the citation. Urban also cited *Daphne tinifolia* Sw. and *Daphnopsis tinifolia* Griseb. as synonyms of *Daphnopsis americana*. Fawcett and Rendle (Journ. Bot. 1925, 51), stated that the specimens of *Laurus americana* Mill. and *Daphne tinifolia* Sw. in Herb. Mus. Brit. represented different species. They considered that the combination *Daphnopsis americana* should, under a type-system, be associated with the plant (Houston's Vera Cruz specimen) on which the epithet *americana* was originally based by Miller: on this point we are all agreed. Fawcett and Rendle proceeded, however, to set out the synonymy of the three species concerned, as follows:—

" 1. *Daphnopsis americana* Johnston (1909), a synonym of *D. caribaea* Griseb. (1860) (*vide* Urban). Lesser Antilles.

2. *Daphnopsis americana* Urban (1921), a synonym of *D. tinifolia* Griseb. Jamaica, Hispaniola.

3. *Daphnopsis americana* nob., *Laurus americana* Mill. Mexico."

At the time when their paper was written, it was not obligatory to cite the original author of an epithet in brackets after a new combination, and the name "*Daphnopsis americana* J. R. Johnston" was admittedly somewhat ambiguous. The situation has now become completely changed by the provision in Art. 49, under which "the original author of an epithet must be cited in parenthesis," and the recognition (under Art. 54) that "the citation in parenthesis (under Art. 49) of the name of the original author . . . indicates the type of the epithet."

If the view put forward by Fawcett and Rendle in 1925, and supported by J. Ramsbottom in proposal no. (16) of this series, is maintained, the date of publication of the accepted combination *Daphnopsis americana* (Mill.) instead of being a matter of ascertainable fact, becomes a mere matter of opinion. If J. R. Johnston was correct in his taxonomic work on *Daphnopsis americana* (Mill.) the date of that combination is 1909; if Urban was correct, the date is 1921; if Fawcett and Rendle were correct, the date is 1925. This will lead to an impossible situation.

T. A. SPRAGUE.

(17 bis). Art. 55, paragraph 2, to read as follows:—"When the epithet of a subdivision of a species, on transference to another genus or species, has been applied erroneously in its new position to a different subdivision of the same rank, the new combination must be retained for the plant on which the former combination was based."

Remarks. This proposal and no. (17) are mutually complementary.

T. A. SPRAGUE.

(18) Art. 58: Omit "when a sub-division of a species becomes a species"; after the word "group" in the third line add "above the rank of species"; delete "or epithet" and "or combination."

A. J. WILMOTT.

(19) Art. 58 bis. In the case of species and their sub-divisions, when the rank of the group is raised the earliest legitimate epithet given to the group in its new rank is valid, unless that name or the resulting combination is a later homonym (see Art. 60, 61) but when the rank is lowered the earliest legitimate epithet of highest

Argument. The aim of this proposal is to attain as much fixity of epithet regardless of rank as can be obtained without the inconvenience of having to replace established specific epithets by unknown epithets of lower rank. Such fixity of epithet would produce a desirable fixity of type for a given group. As the Rules now stand a given group may be legitimately designated by one epithet as a species, by another as a sub-species, by a third as a variety, and so on, each epithet having a different type. The present proposal would ensure that once a group had at any time been given the rank of species, its epithet and type would be fixed so long as the known synonymy remained unchanged.

A. J. WILMOTT.

(20) Art. 60. At the end of the second sentence add "except as indicated under Art. 61."

Argument. As Art. 60 and 61 now stand, there appears to be some contradiction, for by Art. 60 an earlier "illegitimate homonym should not be taken into consideration for purposes of priority," and therefore should not be held to antedate the later homonym.

A. J. WILMOTT.

(21) Art. 60 (1) to read as follows:—"If it was nomenclaturally superfluous when published, i.e. if the group to which it was applied, as circumscribed by its author, included the type of a name which he (or she) ought to have adopted under one or more of the Rules."

The second example to read as follows:—"The genus *Unisema* Raf. (*Med. Repos. N. York*, V. 192: 1819) was so circumscribed as to include *Pontederia cordata* L., the type of *Pontederia* L. (1753). Under Art. 50, Rafinesque ought to have adopted the name *Pontederia* L. for the genus concerned. *Unisema* was therefore nomenclaturally superfluous."

Remarks. The new wording is designed to remove any possible ambiguity regarding the effect of Art. 60 (1).

T. A. SPRAGUE.

(22) Art. 60: 1) delete "there" and substitute "its author cited a name which with his taxonomic interpretations and synonymy." 2) after "author" add "with his taxonomic interpretations and synonymy."

Argument. Salisbury, in a work (*Prodromus*) in which he deliberately replaced existing specific epithets by new ones, gave the name *Ulmus procera* to the plant which he believed to be *Ulmus campestris* L. (emend. Mill.). *Ulmus procera* Salisbury is therefore as illegitimate as the other names in the same work, although by *Ulmus campestris* Linnaeus apparently intended the commonest wild European Elm (= *U. montana* Stokes in With.), the only

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Elm wild in Sweden and the only one in his herbarium. Salisbury, with his interpretation of *U. campestris* L., could not, according to these Rules, put aside the Linnean epithet and use a new one. The view that although throughout the work Salisbury was acting illegally, he nevertheless in this case accidentally acted according to the Rules and did a right thing, i.e. gave a new epithet to a plant which is now known to require one, is contrary to established nomenclatural custom, which was established definitely in the last edition of the Rules by the rejection of willkürliche Namensveränderungen. *Ulmus procera* was such a deliberate name-change, and the position should be made definite by the insertion of the words suggested in this proposal.

A. J. WILMOTT.

(23) Art. 61 Add:—"When an author simultaneously publishes the same new name for more than one group, one use must be considered valid and the other an illegitimate homonym. When the author has himself indicated—in "errata" or in subsequent publications—which of the names he rejects, his choice must be followed unless a different choice has previously been published. When the author has not made the necessary correction, the application which comes first in the work, or that with the lowest number in the case of names validly published with numbered exsiccata, is to be taken as valid, and that following it, or with higher number, as a later homonym."

Examples. Linnaeus (*Species Plantarum* 1753) published *Aira 1 spicata* on p. 63 and *Aira 7 spicata* on p. 64, but in "errata" (vol. II after "Nomina Trivialia" and "Addenda," line 9 from base) substitutes *indicum* for *spicatum* of species 1 on p. 63: the name *Aira spicata* L. is therefore valid for species 7 on p. 64.—Sennen (1929: *Plantes d'Espagne*) published *Polygonum Rechingeri* no. 7067 ("sp. coll. *Persicaria* ?": collected 24.8.1929) and also *Polygonum Rechingeri* no. 7218 (= *P. equisetiforme* auct. hisp. non Sibth. et Sm.: collected 17.8.1929); in the absence of any correction by the author the former of these uses is valid.

A. J. WILMOTT.

(24) Art. 62. Add the following Example:—

Ulmus campestris L. Sp. Pl. 225 has been used by various authors for *U. nitens* Moench, *U. minor* Mill. sec. Henry, *U. glabra* Huds., and *U. procera* Salisb., and has therefore become a *nomen ambiguum* (see Kew Bull. 1933, 503).

J. S. L. GILMOUR.

(25) Art. 62. The first sentence to read as follows:—"A name of a taxonomic group must be rejected if, owing to segregation, it is used with different meanings, and so becomes a permanent source of confusion or error."

Add the following Example:—

Lavandula Spica L. Sp. Pl. 572 included the two species subsequently known as *L. officinalis* Chaix and *L. latifolia* Vill. The name *Lavandula Spica* has been applied almost equally to these two species and, being now completely ambiguous, must be rejected (see Kew Bull. 1932, 295).

Remarks. Typical *nomina ambigua* are names which, originally applied to a group consisting of two or more elements and having no obvious type, have been restricted by some subsequent botanists to one of the original elements, and by other botanists to another. Thus Loiseleur, Bertoloni, Nyman, Briquet, Fiori et Paoletti, Schinz et Thellung, L. H. Bailey and Rehder used the name "*Lavandula Spica* L." in the sense of "Lavender," *L. officinalis* Chaix; whereas Chaix, Gingins, Bentham, De Notaris, Masters, Flückiger, Greenish and Sprague et Nelmes used it in the sense of "Spike," *Lavandula latifolia* Vill. The name *Lavandula Spica* L. has, therefore, become completely ambiguous. This ambiguity cannot be removed in any practical way, even by citing the name of an emending author. If the name is cited "*Lavandula Spica* L. em. Loisel." it may require considerable investigation, by those who are unaware of the above-mentioned paper, to discover what is meant. Furthermore, many of those who constantly employ botanical names, but are not taxonomic botanists (e.g. physiologists, ecologists, gardeners, foresters, pharmacists) seldom add the name of the author. Hence Art. 62 and the example of *Lavandula Spica* are absolutely in accordance with the general principle laid down in Art. 4 (2): "to avoid or to reject the use of forms and names which may cause error or ambiguity or throw science into confusion."

M. L. GREEN and T. A. SPRAGUE.

(26) Art. 62. Delete, and replace by Art. 47 bis. A. J. WILMOTT.

(27) Rec. XXXVII. Before the last sentence add:—"The connective *secundum* (abbreviated *sec.*) should be used between the names of the original and certifying authors."

Argument. It seems desirable that the connectives used in nomenclature should each be given a precise function and meaning.

A. J. WILMOTT.

(28) Art. 70. Note 1. Add the following:—"They do not refer to the use of an initial capital or small letter, this being a question of typography dealt with by Art. 25 and 26 for names of genera and subgenera, etc., and by Rec. XLIII for specific and other epithets."

T. A. SPRAGUE.

(29) Art. 70. Add: "Note 2 bis. The publication of a personal generic name in a masculine form (with the termination *-us* or *-ius*) instead of the feminine (*-a* or *-ia*) is treated as an unintentional orthographic error which must be corrected (see Rec. X h).

Examples. The generic names *Riccardius*, *Marchesinius* (*Marchesinus*), *Bazzanius*, *Herbertus* and *Pallavicinius*, published by S. F. Gray, Nat. Arr. Brit. Pl. I (1821), 683, 689, 704, 705, 775, are treated as unintentional orthographic errors for *Riccardia*, *Marchesinia*, *Bazzania*, *Herberta* and *Pallavicinia* respectively" (motion approved by the Sub-committee for Hepaticae).

Remarks. To the present day all hepaticologists, with very few exceptions, have opposed the use of the masculine (original) form of Gray's generic names.

Most workers on hepaticology, among them the three best and most influential authors Spruce, Schiffner and Evans follow Caruthers (1865) and use the feminine form of these names.

Some authors, however, refused to use Gray's generic names, notwithstanding their undoubted priority and the fact that they had been given to some of the most important and largest genera of Hepaticae. Generally they admit the priority of the masculine form of these names, but do not want to use it as it has almost never been used before. They consider the feminine form as something conflicting with the rules and adopt, therefore, names given by later authors.

As everywhere the principle of priority is not adhered to, great confusion is caused, which should force us to acknowledge as correct the feminine form of these names, as used by Spruce, Schiffner and Evans.

Nearly all problems of the complicated nomenclature of the hepatics would be solved if the above proposal were adopted, if not we should be forced to propose a considerable number of Nomina Conservanda et Rejicienda.

It might be superfluous to assert that the arguments formerly brought against Gray's generic names no longer have any significance in the light of the present Rules.

FR. VERDOORN.

(30) Rec. XLIII. To read as follows:—"Specific (or other) epithets should be written with a small initial letter, except those which are derived from names of persons (substantives or adjectives) or are taken from generic or vernacular names (substantives or adjectives)."

Add the following examples:—"Schinus Molle (Peruvian vernacular name) *Astrocaryum Tucuma* (Brazilian vernacular name)."

Remarks. The present wording of Rec. XLIII puts a great burden on those who have to prepare and edit general lists of botanical names. It is often a very long and difficult task to discover whether a particular vernacular name has been used as a pre-Linnean generic name or not.

M. L. GREEN.

(31) Rec. XLIII. For "taken from" read "are former."

Argument. As formulated at present, the Recommendation would advise the spelling of epithets such as *taxifolia*, *ramunculifolia* etc. with initial capitals, contrary to established usage. *Hyssopifolia* is an old generic name, but while the wording of the Recommendation remains as at present, it is a misleading example.

A. J. WILMOTT.

(32) That Art. 72 (1) be replaced by the following:—"A Greek or Latin word adopted as a generic name retains its classical gender. In cases where the classical gender varies the author has the right of choice between the alternative genders. In doubtful cases, general usage must be followed.

The following names, however, whose classical gender is masculine, are treated as feminine in accordance with historic usage: *Adonis*, *Orchis*, *Stachys*, *Diospyros*, *Strychnos*; *Hemerocallis* (m. in Sp. Pl.; Lat. and Gr. *hemerocalles*, n.) is also treated as feminine in order to bring it into conformity with all other generic names ending in *-is*."

Explanatory remarks. The effect of the change will be to standardize the gender of classical generic names. It involves altering the gender of Linnean generic names (Phanerogamae) in only 15 cases. The following names become masculine: *Cissus*, *Cistus*, *Aspalathus*, *Scorpiurus*, *Potamogeton*, *Tragopogon*, *Erigeron*, *Croton*, *Panax*, *Styrax*. The following become feminine: *Hemerocallis* and *Prinos*; and the neuter gender is restored to *Nama*, *Pentapetes* and *Phyteuma*.

Several of the above names have usually been given their correct classical gender, e.g. *Cistus*, *Tragopogon*, *Erigeron*, *Croton*, *Panax*, *Styrax*, *Phyteuma*. *Scorpiurus* and *Tragopogon* will now agree in gender with all modern compounds ending in *-urus* and *-pogon*, e.g. *Cynosurus* and *Andropogon*. *Croton*, *Styrax* and *Panax* will retain the gender assigned to them in DC. Prodr. Eng. Pflanzenreich, and Engl. Pflanzenfamilien, and will also be in conformity with modern compounds based on them, e.g. *Julocroton*, *Afrostryax*, and *Nothopanax*.

It seems desirable to give brief notes on the genders of a few Linnean generic names. The Latin word *rumex* was either masculine or feminine (Kennedy, Revised Latin Primer, 223), and the masc. gender adopted for *Rumex* by Linnaeus is accordingly retained; *atriplex* was masc., fem. or neut. in Latin, and therefore remains fem. as in Sp. Pl.; *potamogeton* was masc. or fem. in Greek, doubtful in Latin, neut. in Sp. Pl.; in accordance with general usage in standard taxonomic works (e.g. Fryer and Bennett, The *Potamogetons* of the British Isles, Engler's *Pflanzenreich*), the generic name *Potamogeton* is now treated as masculine.

A word of caution may be required concerning the feminine gender attributed to certain names used in Pliny's *Historia Naturalis*.

Pliny frequently uses a feminine adjective agreeing with the word "herba" understood. Thus he has "Geranion . . . Similis est cicutae," although he (like all other authors) treats geranion as neuter, as is seen from the phrase "Geranion in vino potum" (Plin. Hist. Nat. ed. Harduin. ii. 407, l. 11; ii. 415, l. 15). On the other hand, the masculine and neuter genders used in Pliny present no difficulty. The phrase "Cissos . . . coxendicibus utilis e vino potus" (Plin. ed. Harduin. ii. 339, l. 26) indicates that cissos was masculine in Latin as well as in Greek.

M. L. GREEN.

(33) Art. 73. The delay in the publication of the revised International Rules of Botanical Nomenclature as modified at Cambridge (1930) has prevented the working of the organization drawn up at that meeting.

The following suggestions are put forward for consideration at the Amsterdam (1935) Congress:—

1. The same personnel of various Committees should be retained until 1940 so far as possible.
2. That each Committee should elect a Secretary whose name shall be put forward to the Section for approval.
3. That a Secretary shall remain in office until the next International Botanical Congress.
4. That the Secretary of each Sectional Committee shall report matters on which the committee has agreed, to the Secretary of the Executive Committee twelve months before the next Congress. These shall be circulated to the members of the Executive Committee and arranged for consideration at the following Congress.
5. That it is in the best interests of botanical nomenclature that the personnel of the committees should not be permanent; that there should be regular change of secretaries, and as much change as is expedient in the personnel of the committees.
6. That the Secretary of the Executive Committee elected at one International Botanical Congress shall act as a liaison-officer with the organizers of the next Congress in all matters concerning nomenclature.
7. That at the Amsterdam Congress separate committees be set up.
 - (a) to draw up regulations for determining types (Appendix I.)
 - (b) prepare a list of Representative Botanical Institutes (Appendix VII.)
 - (c) report on the nomenclature of garden plants (Appendix VIII.) and on articles 31–35.
8. That the sectional committees receive the names proposed for the list of:

Nomina conservanda familiarum	(Appendix II)
Nomina ambigua	(Appendix IV)
Nomina dubia*	(Appendix V)
Nomina confusa	(Appendix VI)
Nomina generica conservanda	(Appendix III)

in their respective groups and later report on these to the Executive Committee.

9. That all lists should be in the hands of the Secretary of the Executive Committee by September 1939 so that Art. 73 (2), (3) and (4) may be properly carried out.

J. RAMSBOTTOM.

(34) *General proposal*.—That Rec. XXXIX–XLIV be submitted for revision to a select committee of competent scholar botanists, with a view to giving the sanction of Rules to much of the matter contained in these Recommendations; and that an addition be made to Art. 70 to the effect that "when an author has not found his name or epithet in accordance with Articles . . . [of these Rules] is must be altered accordingly."

Argument. As the position now stands the original spelling alone is legitimate—for one species *rhynchocarpa*, for another *rynchocarpa*, for one *europaea*, for another *Europaea* (for there is no authority in the Rules for departing from the original spelling of geographical epithets with initial capitals, etc.). The whole position requires standardisation: one should not be expected to memorise such details.

The present prescriptions could be submitted to a select committee of competent scholar botanists. There seems to be no linguistic justification for the use of -ii in the genitive, except when the nominative would be -ius, and the form *Babingtoni* would preserve the correct pronunciation of the name. The whole of these prescriptions require some reconsideration if, as here proposed, part of them be changed into Rules.

A. J. WILMOTT.

(35) APPENDIX II. NOMINA FAMILIARUM CONSERVANDA.

List proposed by J. Lanjouw and T. A. Sprague.

Eight very well known names of families of Phanerogamae not ending in the suffix -aceae were conserved under the International Rules of Nomenclature, ed. 2 (1912), Art. 22. These were: *Palmae*, *Gramineae*, *Cruciferae*, *Leguminosae*, *Guttiferae*, *Umbelliferae*, *Labiatae*, *Compositae*. At the Cambridge Congress (1930), it was pointed out that other very widely used names of families could not be maintained unless they were conserved, the name *Scrophulariaceae*, for example, being antedated by *Rhinanthaceae*. The Congress accordingly decided to establish an enlarged list of "Nomina

* No Appendix for *nomina dubia* is recognized in the International Rules, ed. 3.—T.A.S.

conservanda familiarum." The list which follows is submitted for the consideration of the appropriate Committees, and for that of the International Botanical Congress, Amsterdam, 1935.

The list comprises the 185 names of families which are employed both in Bentham and Hooker's *Genera Plantarum* and in Engler u. Gilg, *Syllabus der Pflanzenfamilien*, ed. 9/10 (1924). They are in the form prescribed by Art. 23 of the Rules (ed. 3). The name *Papilionaceae*, which may be used by those who regard that group as constituting an independent family, is also included.

By the method of selection adopted, all personal predilections in favour of a particular system of classification are eliminated. It will doubtless be necessary to add other names, but the present list is put forward as a non-controversial basis on which the complete list may be founded.

It has been necessary to modify the spelling of a few names in order that they may correspond with the correct spelling of the type genera. These cases are discussed in the notes. The name *Balanopsidaceae*—badly formed from *Balanops*—has not been altered, because no satisfactory alternative form has been found. The spelling *Balanopaceae*, suggested in a recent circular by Mr. J. Adams (Ottawa) does not immediately recall the generic name *Balanops*.

Probably many of the names in the list are the correct ones under International Rules. It seems desirable, however, to suggest all of them for conversation, as an investigation into the validity of even 50 names would involve so much time as to be impracticable, since no adequate list exists of the places and dates of publication of family names.

NOMINA FAMILIARUM CONSERVANDA.

Cycadaceae; Gnetaceae.

Typhaceae; Pandanaceae; Najadaceae; Alismataceae; Hydrocharitaceae; Triuridaceae; Gramineae;* Cyperaceae; Palmae;* Cyclanthaceae; Araceae; Lemnaceae; Flagellariaceae; Restionaceae; Centrolepidaceae; Mayacaceae; Xyridaceae; Eriocaulaceae; Rapateaceae; Bromeliaceae; Commelinaceae; Pontederiaceae; Philodendraceae; Juncaceae; Liliaceae; Haemodoraceae; Amaryllidaceae; Taccaceae; Dioscoreaceae; Iridaceae; Burmanniaceae; Orchidaceae.

Casuarinaceae; Piperaceae; Chloranthaceae; Salicaceae; Myricaceae; Balanopsidaceae; Leitneriaceae; Juglandaceae; Batidaceae; Urticaceae; Proteaceae; Santalaceae; Olacaceae; Loranthaceae; Balanophoraceae; Aristolochiaceae; Polygonaceae; Chenopodiaceae; Amaranthaceae (1); Nyctaginaceae; Phytolaccaceae; Portulacaceae; Caryophyllaceae.

* An alternative name ending in *-aceae* may be used for this family.

Nymphaeaceae; Ceratophyllaceae; Ranunculaceae; Berberidaceae; Menispermaceae; Magnoliaceae; Calycanthaceae; Annonaceae (2); Myristicaceae; Monimiaceae; Lauraceae; Papaveraceae; Capparidaceae; Cruciferae;* Resedaceae; Moringaceae.

Sarracenaceae; Nepenthaceae; Droseraceae; Podostemaceae (3); Crassulaceae; Saxifragaceae; Pittosporaceae; Bruniaceae; Hamamelidaceae; Platanaceae; Rosaceae; Connaraceae; Leguminosae;* Papilionaceae.†

Geraniaceae; Linaceae; Humiriaceae (4); Zygophyllaceae; Rutaceae; Simaroubaceae; Burseraceae; Meliaceae; Malpighiaceae; Vochysiaceae; Tremandraceae; Polygalaceae; Euphorbiaceae; Empetraceae; Coriariaceae; Anacardiaceae; Cyrillaceae; Celastraceae; Salvadoraceae; Stackhousiaceae; Sapindaceae; Sabiaceae; Rhamnaceae; Chlaenaceae; Tiliaceae; Malvaceae; Sterculiaceae.

Dilleniaceae; Ochnaceae; Guttiferae;* Dipterocarpaceae; Elatinaceae; Frankeniaceae; Tamaricaceae; Cistaceae; Bixaceae; Lacisternaceae; Canellaceae; Violaceae; Turneraceae; Passifloraceae; Loasaceae; Datisceae; Begoniaceae; Cactaceae; Penaeaceae; Thymelaeaceae; Elaeagnaceae; Lythraceae; Rhizophoraceae; Combretaceae; Myrtaceae; Melastomataceae; Haloragaceae (5); Araliaceae; Umbelliferae;* Cornaceae.

Diapensiaceae; Ericaceae; Epacridaceae; Myrsinaceae; Primulaceae; Plumbaginaceae; Sapotaceae; Ebenaceae; Styracaceae.

Oleaceae; Loganiaceae; Gentianaceae; Apocynaceae; Asclepiadaceae; Convolvulaceae; Polemoniaceae; Lennoaceae; Hydrophyllaceae; Boraginaceae (6); Verbenaceae; Labiatae;* Solanaceae; Scrophulariaceae; Bignoniaceae; Pedaliaceae; Orobanchaceae; Gesneriaceae; Columelliaceae; Lentibulariaceae; Acanthaceae; Myoporaceae; Plantaginaceae.

Rubiaceae; Caprifoliaceae; Valerianaceae; Dipsacaceae; Cucurbitaceae; Campanulaceae; Goodeniaceae; Stylidiaceae; Calyceraceae; Compositae.*

NOTES.

(1) *Amaranthaceae*. The name of the type genus is *Amaranthus* L. (1753). This spelling must be retained under International Rules, since it was deliberately adopted by Linnaeus in preference to the classical form *Amarantus* (see Kew Bull. 1928, 287, 343). The family name is therefore *Amaranthaceae* (not *Amarantaceae*).

(2) *Annonaceae*. The name of the type genus is *Annona* L. (1753), which was deliberately adopted by Linnaeus in preference to *Anona*. He rejected the latter on the ground that it was a "barbarous" name, whereas *Annona* was a classical word (see Kew Bull. 1928, 344). The family name is therefore *Annonaceae*.

* An alternative name ending in *-aceae* may be used for this family.

† If treated as an independent family.

(3) *Podostemaceae*. The name of the type genus is *Podostemum*. The family name is therefore *Podostemaceae* (see Kew Bull. 1933, 46.).

(4) *Humiriaceae*. The correct name for the type genus is *Houmiri* Aubl. (1775). The Latinized form *Humiria* Jaume St. Hil. (1805) is so widely employed, however, that it seems desirable to conserve it. Unless this is done, the spelling of the family name will have to be altered.

(5) *Haloragaceae*. The name of the type genus is *Haloragis* (see Kew Bull. 1928, 354). The International Rules prohibit alterations in spelling based solely on philological grounds. The spelling of the family name follows that of the generic one.

(6) *Boraginaceae*. It has been shown that the correct spelling, under International Rules, of the name of the type genus is *Borago* (see Kew Bull. 1928, 288, 348). The name of the family must correspond.

(36) APPENDIX III. 1. ALGAE.

List proposed by G. Tandy.

PHAEOPHYCEAE.

(Laminariac.) *Agarum* Bory, Dict. Class. Hist. Nat. IX, 193 (1826) (non Link in Schrad. Neues Journ. f. d. Bot. III, 7 (1809) = *Phyllophora* Grev. nom. conserv.)

(Chordariac.) *Chordaria* Ag. Syn. Alg. Scand. XII (1817) emend. (non Link in Schrad. Neues Journ. f. d. Bot. III, 8 (1809) = *Chorda* Stackh.) Standard species: *C. divaricata* Ag.

Link's name was a simple illegitimate change for *Chorda* Stackh. with citation of the same type (*Fucus Filum* Linn.) "melius *Chordaria* vocanda." The recognition of the distinctions between the various species assembled by Agardh under *Chordaria* led to the re-establishment of *Chorda* and the retention of *Chordaria* for some of the remainder. In the restricted sense it has been in use for over 100 years without challenge.

(Elachistac.) *Elachista* ("Elachistea") Duby, Bot. Gall. 972 (1830). This is a mere regularization of an item in the accepted list. In the third edition of the International Rules (p. 86) the spelling is "Elachista Duby, Mem. Ceram. I (1832) p. 19." In the place cited the spelling is Elachistea and there is reference to Bot. Gall. where the spelling is the same. Of the two forms Elachistea has been very little used.

(Dictyotac.) *Zonaria* Ag. Syn. Alg. Scand. XX (1817) emend. sensu J. Ag. in Linnæa XV, 445 (1841).

Standard species: *Z. variegata* (Lamour.) Ag.

Nomen rejiciendum: *Villania* Nieuwl. in Amer. Midl. Naturalist V, 51 (1917).

Zonaria was originally an illegitimate change for *Dictyota* Lamour. There remains some doubt whether *Dictyota* is itself

legal but *Zonaria* certainly is not and its ascription to Draparn. is unsupported by any other publication. As emended it has, nevertheless, been used almost exclusively and was not challenged until 1917.

RHODOPHYCEAE.

(Helminthocladia.) *Helminthocladia* J. Ag. Spec. Gen. & Ord. Alg. II, 412 (1852) (non Harv. Genera S. Afr. Pl. 396 (1838)). This is one of the changes necessitated by the changing of the homonym rule in 1930. J. Agardh thought that the relegation to synonymy of Harvey's name allowed him to use it again in a different sense.

APPENDIX III. 2. PHANEROGAMAE.

(37). List proposed by J. E. Dandy.

The generic names listed below are proposed for addition to Appendix III (Nomina generica conservanda). These names are all in current use for genera of *Phanerogamæ*, and with one notable exception (n. 1032 *Laxmannia*) have been generally adopted in important botanical works. *Laxmannia* has been passing under two names, both illegitimate, and it is therefore thought advisable to conserve one of them.

For convenience the names are grouped in two sections: (a) names invalidated by earlier synonyms, and (b) names invalidated by earlier homonyms.

(a) NAMES INVALIDATED BY EARLIER SYNONYMS.

57 (Potamog.) *Posidonia* König in König & Sims, Ann. Bot. ii. 95, t. 6 (1805). Type-species: *P. Caulini* König.

Nomen rejiciendum: *Alga* Boehm. in Ludw. Defin. Gen. Pl., Ed. Boehm. 503 (1760).

A well-known genus of marine phanerogams, with 2 species. If *Posidonia* is not conserved the genus will have to be called *Alga*; this, for obvious reasons, is highly undesirable. *Posidonia* is the type-genus of the tribe *Posidoniæ* and of the family *Posidoniaceæ* which is recognised by some authors.

512 (Cyper.) *Eriospora* Hochst. ex A. Rich. Tent. Fl. Abyssin. ii. 508 (1851). Type-species: *E. abyssinica* Hochst. ex A. Rich.

Nomen rejiciendum: *Catagyna* Beauv. ex Lestib. Ess. Fam. Cypér. 26 (1819).

A genus of 4 or 5 species in Africa.

808 (Restion.) *Leptocarpus* R. Br. Prodr. Fl. Nov. Holland, i. 250 (1810). Standard-species: *L. aristatus* R. Br.

Nomen rejiciendum: *Schoenodum* Labill. Nov. Holland. Pl. Specim. ii. 79 (1805); emend. Kunth, Enum. Pl. iii. 445 (1841).

This is a genus of about 12 species in Australasia, Chile, and south-eastern Asia. *Schoenodum* was based on a single taxonomic species, *S. tenax* Labill., which according to R. Brown (*tom. cit.* 248 sub *Lyginia*) is a mixture of two species belonging to different Restionaceous genera. Brown therefore rejected the name *Schoenodum*, referring the male *S. tenax* to *Lyginia imberbis* R. Br. and the female to *Leptocarpus tenax* (Labill.) R. Br., for which species he retained Labillardiere's specific epithet. *Schoenodum* was subsequently emended by Kunth (*loc. cit.*) and was adopted by C. Gay (*Hist. Chil., Bot. vi. 152* (1853)) in the sense of *Leptocarpus*. It may be argued that *Schoenodum* can be rejected as a *nomen confusum* under Art. 64, but this is open to doubt since the name was based on two Restionaceous plants which, though now referred to different genera, can scarcely be described as entirely discordant elements. In any event it is as simple to add *Leptocarpus* to the list of *nomina generica conservanda* as to add *Schoenodum* to the list of *nomina confusa* (Appendix V).

894 (Commelin.) **Palisota** Reichb. [*Consp. Reg. Veg.* 59 (1828), *nomen nudum*] ex Endl. *Gen. Pl.* 125 in obs. (1836). Type-species: *P. ambigua* (Beauv.) C. B. Clarke (*Commelina ambigua* Beauv.).

Nomen rejiciendum: *Duchekia* Kostel. *Allgem. Med.-pharm. Fl. i.* 213 (1831).

A genus of about 25 species in tropical Africa.

1324 (Zingib.) **Zingiber** Boehm. in Ludw. *Defin. Gen. Pl.*, Ed. Boehm. 89 (1760). Standard-species: *Z. officinale* Rosc. (*Amomum Zingiber* L.).

Nomen rejiciendum: *Zinziber* Mill. *Gard. Dict. Abridg.*, Ed. 4, iii (1754).

A large and important genus with more than 80 species in the warmer parts of Asia and Australia. *Zingiber officinale* (common ginger) is widely cultivated. *Zingiber* is the type-genus of the family *Zingiberaceae*, the subfamily *Zingiberoideae*, and the tribe *Zingibereae*.

1408 (Orchid.) **Holothrix** Rich. [in *Mém. Mus. Hist. Nat.* iv. 55 in obs. (1818), *nomen nudum*] ex Lindl. *Gen. & Sp. Orchid. Pl.* 257, 283 (1835). Type-species: *H. hispidula* (L. f.) Dur. & Schinz (*Orchis hispidula* L. f.).

Nomina rejicienda: *Tryphia* Lindl. [in Edw. *Bot. Reg.* xx. sub t. 1701 (1834), *nomen nudum*] *Gen. & Sp. Orchid. Pl.* 258, 333 (1835). *Scopularia* Lindl. in Edw. *Bot. Reg.* xx. sub t. 1701 (1834). *Monotris* Lindl. *loc. cit.* *Saccidium* Lindl. *Gen. & Sp. Orchid. Pl.* 258, 301 (1835).

A genus with a large number of species in tropical and South Africa.

1488 (Orchid.) **Pelexia** Poit. ex [Rich. in *Mém. Mus. Hist. Nat.* iv. 59 (1818), *nomen nudum*] Lindl. in Edw. *Bot. Reg.* xii. sub t.

985 (1826). Type-species: *P. adnata* (Sw.) Spreng. (*Neottia adnata* (Sw.) Sw.).

Nomen rejiciendum: *Collea* Lindl. in Edw. *Bot. Reg.* ix. sub t. 760 in obs. (1823).

A genus with about 10 species in tropical America.

1500 (Orchid.) **Anoectochilus** Bl. *Fl. Jav. praef. p. vi*, in adnot. (1828). Type-species: *A. setaceus* (Bl.) Lindl. (*Anecoehilus setaceus* Bl.).

Nomina rejicienda: *Anecoehilus* Bl. *Bijdr. Fl. Nederl. Ind.* 411 (1825). *Chrysobaphus* Wall. *Tent. Fl. Napal. Illustr.* 37 (1826).

A genus of about 25 species in Indo-Malaya. The name *Anoectochilus* was substituted by Blume for his earlier *Anecoehilus*, and has been generally adopted.

1704 (Orchid.) **Cirrhopetalum** Lindl. [in Edw. *Bot. Reg.* x. sub t. 832 (1824), *nomen nudum*] *Gen. & Sp. Orchid. Pl.* 58 (1830). Type-species: *C. Thouarsii* Lindl. (*Bulbophyllum longiflorum* Thou.).

Nomina rejicienda: *Zygoglossum* Reinw. [ex Bl. *Cat. Gewass. Lands Plantent. Buitenz.* 100 (1823), *nomen nudum*] apud Hornsch. in *Syll. Pl. Nov.* ii. 4 (1828). *Ephippium* Bl. *Bijdr. Fl. Nederl. Ind.* 308 (1825). *Hippoglossum* Breda, *Gen. & Sp. Orchid.* (1827).

A genus with a large number of species in Indo-Malaya, Australia, and the Mascarene Islands.

1714 (Orchid.) **Panisea** (Lindl.) Lindl. *Fol. Orchid.* (1854). Type-species: *P. parviflora* (Lindl.) Lindl. (*Coelogyne parviflora* Lindl.).

Nomen rejiciendum: *Androgyne* Griff. *Notul. Pl. As.* iii. 279 (1851).

A genus of about 4 species in India. The generic name *Panisea* was based on *Coelogyne* sect. *Panisea* Lindl., *Gen. & Sp. Orchid. Pl.* 44 (1830).

1778 (Orchid.) **Miltonia** Lindl. in Edw. *Bot. Reg.* xxiii. sub t. 1976 in obs. (1837). Type-species: *M. spectabilis* Lindl.

Nomen rejiciendum: *Gynizodon* Raf. *Fl. Tellur.* iv. 40 (1836).

A genus of 20 or more species in tropical America, some of which are in cultivation.

4627 (Celastr.) **Gymnosporia** (Wight & Arn.) Benth. & Hook. f. *Gen. Pl.* i. 365 (1862). Standard-species: *G. montana* (Roxb.) Benth. (*Celastrus montanus* Roxb.).

Nomina rejicienda: *Burglaria* Wendl. ex Steud. *Nomencl. Bot.* 129 (1821), *nomen nudum*. *Scytophyllum* Eckl. & Zeyh. *Enum. Pl.* 124 (1835). *Encentrus* C. Presl in *Abhandl. Böhm. Gesellsch. Wissensch.*, *Folg.* 5, iii. 463 (1844). *Polyacanthus* C. Presl, *loc. cit.*

This genus includes a large number of species in the warmer parts of the World. The generic name *Gymnosporia* was based by Benth and Hooker on *Celastrus* sect. *Gymnosporia* Wight & Arn. *Prodr. Fl. Penins. Ind. Or.* i. 159 (1834).

(b) NAMES INVALIDATED BY EARLIER HOMONYMS.

462 (Cyper.) **Kyllinga** Rottb. Descr. & Icon. Pl. 12 (1773)—non *Killinga* Adans. Fam. Pl. ii. 498, 539 (1763). Standard-species : *Kyllinga monocephala* Rottb.

Nomen rejiciendum : *Thryocephalon* J. R. & G. Forst. Charact. Gen. Pl. 129, t. 65 (1776).

This is a genus with a large number of species in tropical and sub-tropical regions.

974 (Liliac.) **Anguillaria** R. Br. Prodr. Fl. Nov. Holland. i. 273 (1810)—non Gaertn. Fruct. & Semin. Pl. i. 372 (1788). Standard-species : *A. dioica* R. Br.

An Australian genus of about 3 species, for which no other name has been proposed. *Anguillaria* R. Br. is the type-genus of the tribe *Anguillarieae*.

1032 (Liliac.) **Laxmannia** R. Br. Prodr. Fl. Nov. Holland. i. 285 (1810)—non J. R. & G. Forst. Charact. Gen. Pl. 93, t. 47 (1776), nec Schreb. in L. Gen. Pl., Ed. 8, ii. 800 (1791). Standard-species : *L. gracilis* R. Br.

Nomen rejiciendum : *Bartlingia* F. Muell. [ex Benth. Fl. Austral. vii. 63 in obs. (1878), *nomen synonymum*] in Journ. & Proc. R. Soc. New S. Wales xv. 232 (1882)—non Reichb. in Flora vii. 241 (1824), nec Brongn. in Ann. Sci. Nat. x. 373 in adnot. 2 (1827).

A genus of about 8 species in Australia. There has been no agreement about the name of this genus, some using *Laxmannia* R. Br., others *Bartlingia* F. Muell., neither of which is legitimate. It is proposed to settle the point by conserving *Laxmannia*, the first name. *Laxmannia* was adopted by Benth. Fl. Austral. vii. 63 (1878), by Bentham & Hooker, Gen. Pl. iii. 796 (1883), and by Engler in Engl. & Prantl. Nat. Pflanzenfam. ii. 5. 48 (1888). *Bartlingia* was adopted by K. Krause in Engl. & Prantl. *op. cit.*, Ed. 2, xv. a. 308 (1930).

1037 (Liliac.) **Johnsonia** R. Br. Prodr. Fl. Nov. Holland. i. 287 (1810)—non Dale ex Mill. Gard. Dict. Abridg., Ed. 4, ii (1754), nec Adans. Fam. Pl. ii. 343 (1763). Type-species : *J. lupulina* R. Br.

An Australian genus of 3 species, for which no other name has been proposed. *Johnsonia* R. Br. is the type-genus of the tribe *Johnsonieae*.

1617 (Orchid.) **Laelia** Lindl. Gen. & Sp. Orchid. Pl. 96, 115 (1831)—non Adans. Fam. Pl. ii. 423 (1763). Standard-species *L. grandiflora* (Llave & Lexarza) Lindl.

Nomen rejiciendum : *Amalia* Reichb. Deutsch. Bot. i. 52 (1841).

A genus with numerous species in tropical America, some of which are well-known in cultivation and have hybridized freely with *Cattleya*.

2068 (Prot.) **Banksia** L. f. Suppl. Pl. 15, 126 (1781)—non J. R. & G. Forst. Charact. Gen. Pl. 7, t. 4 (1776). Standard-species : *B. integrifolia* L. f.

Nomen rejiciendum : *Sirmuelleria* Kuntze, Revis. Gen. Pl. ii. 581 (1891).

An important genus of about 50 species in Australia. *Banksia* L. f. is the type-genus of the tribe *Banksieae*.

Banksia J. R. & G. Forst. is the oldest name for a large genus of *Thymelaeaceae* for which the name *Pimelea* Banks ex Gaertn. (1788) is already conserved. Conservation of *Banksia* L. f. for the Proteaceous genus would render the conservation of *Pimelea* unnecessary.

3182 (Saxifrag.) **Bergenia** Moench, Meth. Pl. 664 (1794)—non *Bergena* Adans. Fam. Pl. ii. 345 (1763). Type-species : *Bergenia bifolia* Moench.

Nomen rejiciendum : *Geryonia* Schrank in Flora i. 230 (1818).

A genus of about 8 species in central and eastern Asia. Some of the species are well-known in cultivation and have been considerably hybridized.

3185 (Saxifrag.) **Boykinia** Nutt. in Journ. Acad. Nat. Sci. Philad. vii. 113 (1834)—non Raf. (1817). Type-species : *B. aconitifolia* Nutt.

Nomina rejicienda : *Telesonix* Raf. Fl. Tellur. ii. 69 (1836). *Therofon* Raf. New Fl. & Bot. N. Amer. iv. 66 (1836).

A genus of about 9 species in North America and Japan.

3204 (Saxifrag.; jam Stylid.) **Donatia** J. R. & G. Forst. Charact. Gen. Pl. 9, t. 5 (1776)—non Loebl. Iter Hispan. 193 (1758). Type-species : *D. fascicularis* J. R. & G. Forst.

Nomen rejiciendum : *Orites* Banks & Soland. ex Hook. f. Bot. Antarct. Voy. I. ii. 282 (1846), *nomen synonymum*.

This is a genus of 2 species in temperate South America, New Zealand and Tasmania. It has no legitimate name, for *Orites* has been published only in synonymy. *Donatia* J. R. & G. Forst. is the type-genus of the sub-family *Donatioideae* of *Stylidiaceae*.

4957 (Tiliac.) **Sparrmannia** (*Sparrmannia*) L. f. Suppl. Pl. 41, 265, 468 (1781)—non Buc'hoz, Pl. Nouvellem. Découv. 3 (1779). Type-species : *S. africana* L. f.

An African genus of 3-5 or more species, for which no other name has been proposed. *S. africana* is well-known in cultivation. The spelling *Sparrmannia* is proposed for conservation since it has been consistently in use, although the name was spelt *Sparrmannia* by Linn. f.

Rehmannia Libosch. ex Fisch. & Mey. (1835) is conserved against *Sparrmannia* Buc'hoz for a genus of *Scrophulariaceae*. Conservation of *Sparrmannia* L. f. for the Tiliaceous genus would render the conservation of *Rehmannia* unnecessary.

8887 (*Compos.*) **Amellus** L. Syst. Nat., Ed. 10, ii. 1225 (1759)—non P. Browne, Civ. & Nat. Hist. Jamaic. 317 (1756). Standard-species: *A. lychnites* L.

Nomen rejiciendum: *Haenelia* Walp. Repert. Bot. Syst. ii. 974 (1843).

This is a genus of 9 or 10 species in South Africa.

Amellus P. Browne is congeneric with *Melanthera* Rohr (1792), a name in general use for an important genus of African and American *Compositae*. Conservation of *Amellus* L. would therefore also ensure the conservation of *Melanthera* and obviate the confusion which would arise from the transfer of the name *Amellus* from one genus of *Compositae* to another.

(38) Name proposed by A. W. Exell.

3106 (Capparidaceae) **Boscia** Lam. in Encyc. Méth. Illustr. Genr.: t. 395 (1797)—non Thunb., Prod. Pl. Cap.: [x] et 32 (1794). Type-species: *Boscia senegalensis* (Pers.) Lam. ex Poir.

Nomen rejiciendum: *Podoria* Pers., Syn. ii: 5 (1806).

A well-known genus with numerous species in Tropical and South Africa.

(39) Name proposed by M. L. Fernald.

957 **Stenanthium** (A. Gray) Kunth, Enum. iv. 189 (1843); based on *Veratrum*, 2 subgen. *Stenanthium* A. Gray, Ann. Lyc. N.Y. iv. 119 (1837). Standard-species: *S. angustifolium* (Pursh) Kunth.

Nomen rejiciendum: *Anepsa* Raf. Fl. Tellur. pt. iv. 27 (1836-38).

Stenanthium was fully characterized by Kunth (1843) and has been consistently used by all authors since, even by Britton, Small and others who hold to strict priority. It is a genus of several species of America and Asia.

Anepsa Raf. (1836-38) has never been taken up, although it has clear priority. Its publication was characteristically trivial, though it meets technical requirements: "his [Gray's] *Stenanthium* S. G. of *Veratrum* is my *G. Anepsa*."

The rejection of *Stenanthium* would cause serious inconvenience and discredit careful publication; the taking up of *Anepsa* would cause equal inconvenience and several new combinations; it would also mean the acceptance of slipshod publication.

(40) Name proposed by T. A. Sprague.

3953 **Humiria** Jaume St. Hil. Expos. II (1805) 374. Standard-species: *Humiria balsamifera* (Aubl.) Jaume St. Hil.

Nomen rejiciendum: *Houmiri* Aubl. Hist. Pl. Guiane Franç. I (1775) 564, t. 225.

The original spelling of this generic name is *Houmiri* Aubl. The Latinized form *Humiria* is so widely employed that this spelling is here put forward for conservation. Unless this is done the accepted form of the family name, namely, *Humiriaceae*, will have to be changed.

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APPENDIX III: SUPPLEMENTUM.

Nomina generica homonyma conservanda.

A paper is being prepared by A. Rehder (Arnold Arboretum), R. Mansfeld (Berlin), T. A. Sprague (Kew) and M. L. Green (Kew), for presentation to the Amsterdam Congress.

APPENDIX VI. REPRESENTATIVE BOTANICAL INSTITUTIONS RECOGNIZED UNDER ART. 36.

(41) List proposed by T. A. Sprague and M. L. Green.

Under Art. 36, publication may be effected by distribution of printed matter or "indelible autographs" to specified representative botanical institutions. A provisional list of such institutions, arranged in twenty *geographical* areas, is submitted for consideration. It is suggested that, *in the future* (starting from January 1st, 1936), in order to secure publication in this special way, at least twenty copies should be distributed, one to a recognized institution in each geographical area. Each isolated case of "distribution among representative institutions" that has occurred in the past, should be considered on its own merits.

This list has been prepared merely as a basis for discussion by the Executive Committee or by such special Committee as may be appointed for the purpose.

APPENDIX VI.

1. Europe.

- (1) AUSTRIA AND HUNGARY. Naturhist. Mus., *Wien*; Bot. Inst., Univ., *Wien*; Magyar Kir. Nemzeti Mus., *Budapest*.
- (2) CZECHOSLOVAKIA AND POLAND. Bot. Inst., Charles Univ., *Praha*; Bot. Inst., Deutsch. Univ., *Praha*; Bot. Inst., Univ., *Kraków*; Bot. Inst., Univ., *Warszawa*.
- (3) FRANCE. Mus. Nat. Hist., *Paris*.
- (4) GERMANY. Bot. Mus., *Berlin-Dahlem*.
- (5) GREAT BRITAIN. Roy. Bot. Gard., *Kew*; Brit. Mus. (Nat. Hist.), *London*.
- (6) ITALY. Mus. Bot., Univ., *Firenze*; Ist. Bot., Univ., *Roma*.
- (7) NETHERLANDS AND BELGIUM. Rijks Herb., *Leiden*; Bot. Mus. en Herb., Rijks Univ., *Utrecht*; Jard. Bot., *Bruxelles*.
- (8) SCANDINAVIA AND DENMARK. Naturhist. Riksmus., *Stockholm*; Library, Univ., *Uppsala*; Bot. Mus., Univ., *Oslo*; Bot. Mus., Univ., *Copenhagen*.
- (9) SPAIN AND PORTUGAL. Jard. Bot., *Madrid*; Mus. Ci. Nat., *Barcelona*; Jard. Bot., *Coimbra*.
- (10) SWITZERLAND. Conserv. Bot., *Genève*; Bot. Mus., Univ., *Zürich*.
- (11) U.S.S.R. Jard. Bot., *Leningrad*; Herb., Univ., *Moskau*.

II. Africa.

- (12) SOUTH AFRICA. Bolus Herb., *Cape Town*; Dept. Agric., *Pretoria*.

III. Asia.

- (13) INDIA AND MALAYA. Bot. Gard., *Calcutta*; Bot. Gard., *Singapore*; Bot. Gard., *Buitenzorg*; Bureau of Science, *Manila*.
(14) CHINA. Metrop. Mus. Nat. Hist., *Nanking*.
(15) JAPAN. Imperial University, *Tokyo*.

IV. Australasia.

- (16) AUSTRALIA. Nat. Herb., *Melbourne*; Nat. Herb. N. S. Wales, *Sydney*.
(17) NEW ZEALAND. Dominion Museum, *Wellington*.

V. America.

- (18) CANADA. Nat. Herb., *Ottawa*.
(19) UNITED STATES. Gray Herb., *Cambridge (Mass.)*; New York Botanical Garden; U.S. Nat. Mus., *Washington*.
(20) WEST INDIES AND SOUTH AMERICA. Bot. Gard., *Trinidad*; Jard. Bot., *Rio de Janeiro*; Mus. Nac. Hist. Nat., *Buenos Aires*; Mus. Nac., *Montevideo*; Mus. Nac., *Santiago de Chile*.

(42) APPENDIX "IX."

Works treated, under proposal no. (3), as not validly published.

List proposed by A. J. Wilmott.

Section 1: Works not employing the Linnean biverbal nomenclature for species.

ARDUINO, P.; 1759: *Animadvers. bot. specimen*.

(Note: The "specimen alterum" (1763) contained biverbal nomenclature for species.)

BROWNE, P.; 1756: *Hist. Jamaica*.

1789: *Hist. Jamaica*, ed. 2.

BUCHOZ, P. J.; 1770: *Traité . . . Plant. Lorr. & les trois Evêches* (11 vols.)

FABRICIUS, P. C.; 1759 *Enum. Plant. Hort. Helmstad.*

1763: " " " " ed. 2.

1776: " " " " ed. 3. (posthum.)

GARSAULT, F. A. de; 1764: *Les figures des Plantes et anim. . . Mat. Med.*

1765: *Explication abrégé de sept cents dix-neuf plantes*.

1767: *Descr. . . des plantes*. (4 vols.)

GÉRARD, L.; 1761: *Flora Gallo-provincialis*.

GMELIN, S. G.; 1768-9: *Flora Sibirica* vols. III & IV.

HALLER, A. VON; 1768: *Hist. Stirp. Helv.*, ed. 2.

HILL, J.; 1760: *Flora Britannica*.

1755: *The Useful Family Herbal*.

1756: *The British Herbal*.

MILLER, P.; 1754: *Abridgement of the Gardeners Dictionary*, ed. 4.
? ? ed. 5, non vidi

1758: *The Gardeners Dictionary*, ed. 7.

SCHMIDEL, C. C.; 1762: *Icones Plantarum*

1793: " " ed. 2.

SCOPOLI, J. A.; 1760: *Flora Carniolica*.

SEGUIER, J. F.; 1754: *Pl. Veron.*, Suppl.

ZINN, J. G.; 1757: *Cat. plant. hort. acad. et agri Gottingensis*.

The authors of the publications listed above either wrote no further botanical works or themselves entirely rejected the nomenclature of these earlier works in their later ones. Those who did not accept the Linnean nomenclature were elderly men like Haller, or outstanding botanists who had themselves formulated a classification of plants on different lines, e.g. Gleditsch (mentioned under "dubia" below).

Section 2. Works containing generic names only, but these generic names in accordance with those of works listed in section 1, i.e. not Linnean nomenclature but that of "multiverbalist" authors.

BOEHMER, G. R.; 1760: in Ludwig, C. G., *Definitiones Generum Plantarum*.

LUDWIG, C. G.; 1757: *Inst. Hist. Phys. Reg. Veg.*, ed. 2.

MITCHELL, J.; 1769: *Dissert. Bot. et Zoolog.*—ii pp. 21—*Plant. genera . . . in Virginia observata*.

(N.B. see p. 46: the completion of part ii is dated 11th March, 1741.)

Section 3.

Work containing univocal nomenclature for species.

EHRHART, F.; 1780: *Phytophylacion*.

Section 4.

To be rejected to prevent the invalidation of well established names.

GANDOGHER, M.; 1883-1891: *Flora Europae*, 27 vols. (in 13).

This nomenclature might perhaps be regarded as contrary to Art. 28 sentence 4, but it is preferable to include the work here. If these names are not invalidated they are likely to necessitate the rejection of a large and increasing number of names by Art. 61 (later homonyms).

ADANSON, M.; 1763: *Families des Plantes* (2 vols.). The names now in use which were taken from this work were adopted by Gaertner, Willdenow, De Candolle and others just as Linnaeus adopted names from Tournefort: they would rarely be lost if this work was rejected. There are, however, many names not yet taken up which will necessitate much

change or conservation if the work is not rejected. It certainly was not intended to be part of the Linnean nomenclature (see vol. 1).

"DUBIA": Inclusion or otherwise requiring discussion.

GLEDITSCH, J. G.: possibly all botanical works. Some of this author's works are non-Linnean, but others cite Linnean specific names. The citation of these is, however, often merely in chronological order in synonymy, and his last work has certainly multiverbal nomenclature for species.

Section 5. Miscellaneous.

NECKER, N. J. de ;1790: *Elementa Botanica* (4 vols.) The names of this author which have been used as if they were names of genera are, however, names of his "species naturales" (see p.4), and not of his genera (see p. xxiii). Although this makes them illegitimate under the Rules, it would be better to include in the Appendix such works concerning which there would otherwise be much argument.

Note. It might be well to list here also works known to have been unpublished. Although the names contained are illegitimate there is nothing to indicate to a nomenclator that the work was never published, and confusion may result therefrom. Only works important as affecting nomenclature should be listed.

It might also be well to include a section in which were listed any works which are important in nomenclature but which are so scarce that:

- (a) the names contained in them were long overlooked and caused much change in nomenclature when discovered, and at the same time are still so scarce that
- (b) they are in fact not available for consultation by any but a very few nomenclators.

VI—NEW OR LITTLE KNOWN PLANTS FROM SOUTH INDIA: V.*

Impatiens anaimudica C. E. C. Fischer, sp. nov. [Balsaminaceae]; *I. travancoricae* Bedd. proxima, sed omnibus partibus major, et foliis haud confertis, nervis numerosioribus, ciliis marginalibus e dentibus (nec e sinibus) ortis, sepalis lateralibus 5-7-nervis, alis sanguineis lobis rotundatis, calcari minore, seminibus multo majoribus differt.

An unbranched or slightly branched herb. Stems erect or prostrate, rooting and branching at the nodes, 15-25 cm. high, reddish, lenticelled, younger parts crispately hairy. Leaves alternate, early deciduous from the lower parts of the stem, more persistent towards the apex but not crowded, membranous, broadly ovate to subcircular, acute, base subtruncate, rounded or shortly cuneate, 2-6.3 cm. long, 1.4-4.2 cm. wide, primary nerves 5-7 pairs, evenly

arched, copiously set with short, linear, nearly horizontal cystoliths, upper surface glabrous or with scattered hairs on the nerves, pale and with scattered, often crisped hairs on the nerves below, margins evenly crenate, nearly entire at the base, the teeth apiculate or ciliate; petioles 1-4 cm. long, glabrous or sparsely hairy. Inflorescence axillary, shorter than the leaves; peduncles capillary 2.2-4.5 cm. long, sparsely hairy near the base; bracts lanceolate, acuminate, 2-3 mm. long. Flowers 3-4, subumbellate; pedicels capillary, 7-10 mm. long, glabrous. Lateral sepals ovate, slightly unsymmetric, cuspidate, 6 mm. long, 5-7-nerved, finely streaked with crimson on a lighter background. Lip oblong-ovate, deeply concave, cuspidate, 1-1.2 cm. long, with a very small rounded boss-like spur at the base, light-brownish-crimson, spur and cusp darker. Wing petals 1.4 cm. long, dull-crimson, drying with a bluish tinge, apical lobe semiobovate, rounded, basal lobe, oblong-lanceolate rounded, 3 mm. long. Standard ovate-oblong, cuspidate, 8 mm. long, coloured like the lateral sepals. Capsule ellipsoid, cuspidate-acuminate, 6-7 mm. long, glabrous. Seeds few, often solitary, subglobose, 3-4 mm. long, dotted with tufts of white or brownish papillae.

TRAVANCORE: Anaimudi Ridge, 8000 ft., fls. and frt. September, E. Barnes 582 (type, in Kew Herb.) 579, 580, 581, 583, 811. "A few plants were still flowering in December. Even in September it does not flower very freely."

The figure of *I. travancorica* Bedd. in Ic. Pl. Ind. Or. 1, t. 143 is not very good; it does not agree in all points with the description (l.c. 29) or with the solitary specimen (presumably the type) in the Kew Herb. In the latter the inflorescences clearly overtop the leaves and are about twice as long as the leaves and petioles together; the marginal ciliae come very distinctly from the sinus and not from the teeth of the crenatures as shown in the figure; the dried petals have a distinct purple-pinkish tinge.

Lagenandra ovata Thw. and *L. toxicaria* Dalz. [Araceae-Aroideae].

The first named combination is based on *Arum ovatum* Linn. Sp. Pl. ed 1, 967 (1753). Linneus' description was confined to 3 words; "acaule, foliis ovato-oblongis," but he cited in synonymy Rheede Hort. Malab. 11, 45, t. 23 (1642), where there is a good description and figure under the vernacular name *karinpola*. Schott in Melet. Bot. 16 (1832) transferred the species to the genus *Cryptocoryne*.

Dalziel in Hook. Kew Jour. Bot. 4, 289 (1852) described a new genus *Lagenandra* for a Konkan plant which he named *L. toxicaria* of which a good figure was published as plate 4 in vol. 5 of the same journal.

Schott in Syn. Aroid. 3 (1856) appears to have been the first to consider the two species as identical and united them under the

* Continued from Kew Bulletin, 394, 1934.

name *L. toxicaria* Dalz. This opinion was shared by Thwaites, who, however, altered the name (correctly under that conception) to *L. ovata* in his Enum. Pl. Zeyl. 334 (1864). The identity of the two species has been accepted by all subsequent authors, including myself in Fl. Pres. Madras, 1576 (1931).

Professor E. Barnes has recently sent to Kew excellent specimens from Travancore which necessitated a reconsideration of the case and show that the two species are distinct. This opinion is supported by a comparison of the Rheede and Dalziel figures quoted above. The vegetative parts of the two species are very similar, but all the parts are larger in *L. ovata*. The striking differences lie in the spathes. An examination of the sheet of *Arum ovatum* in the Linnean Herbarium has left me in some doubt as to its identity. The specimen has only a small remnant of the base of the spathe and so does not offer much scope for critical determination. My impression, however, is that the plant is identical with Dalziel's. Nevertheless, the specific name *ovata* must be coupled with the description and figure in Rheede Hort. Malab. I strongly suspect that Dalziel himself confused at least the vegetative parts of the two species (they were found together by Barnes), since he states that the leaf has a "stout petiole two feet long", whereas the longest measured by Professor Barnes was 12 inches long and the longest in Dalziel's specimen (presumably the type) in the Kew Herbarium is only 7 in. long.

The two may be distinguished by the following characters:— (The measurements, unless otherwise stated, are taken from all the specimens now at Kew quoted below).

Cataphylls 15–33 cm. long. *Leaves* oblong, acuminate, 16–38 cm. long, 4–13 cm. wide; petioles 13–47 cm. long (up to 84 cm. *vide* Barnes). *Peduncles* 12–21 cm. long. *Spathes* narrowly turbinate, 6–11 cm. long (5–25 cm. *vide* Barnes), strongly contorted upwards and tapering into a subulate tail 3.5–4.5 cm. long, dark-purple, smooth below, warted or rugose above . . . *ovata*.

Cataphylls 5.8–13 cm. long. *Leaves* elliptic- to ovate-lanceolate, acute or subacute, 11–21 cm. long, 4–9 cm. wide; petioles. 6–17 cm. long (up to 30 cm. *vide* Barnes). *Peduncles* 3–5.5 mm. long. *Spathes* cylindric-oblong, usually slightly constricted above the chamber, 4–5.7 cm. long, 1.5–2 cm. diameter, abruptly narrowed into a slender, openly S-curved tail 8.5–13 cm. long, 1.3–2 mm. diameter, flesh-coloured or brownish-buff with five longitudinal purple stripes below, quite smooth or sometimes very slightly warted and finely hispidulous above, not contorted . . . *toxicaria*.

Professor Barnes has supplied the following descriptive notes on both species;

Lagenandra ovata Thw.

"*Leaves* up to 49 in. long (blade 17, petiole 32). *Stipular sheaths* (*cataphylls*) up to 13½ in. long, 2-keeled. *Spathe* 10×2 in. *Limb*: lower part ovate with an arc-shaped crack or seam which apparently

does not open, upper part twisted like a ram's horn and with the crack open. The whole spathe very dark-purple, practically black in some specimens; lower part smooth, with a sticky lustre, upper part warty. Inside surface dull-black and finely transversely puckered; at the bottom, round the mouth of the passage to the lower chamber is a dome covered with purple and white mossy processes. Internal surface of the chamber dark-purple with numerous longitudinal ridges. *Male flowers* consist of two stamens (loculi?), each truncate with a fine central point. Below the male flowers a number of neuters consisting of white double processes ending in a fine point—these are undeveloped males. Bare part of the spadix white spotted with purple, tapering down to a very slender rod. *Ovaries* in a spherical mass, closely packed at the bottom of the chamber. The whole exposed surface of the ovary appears to be the stigma. *Ovaries* yellow with a red flush, the top of the mass of ovaries round the spadix is sunk and carries a number of rounded white bodies; these appear to be undeveloped ovaries. *Inflorescence* with an unpleasant smell. The purple pigment of the spathe is soluble in alcohol and dilute formalin imparting a fine purple colour to them. *Syncarp* spherical, about 1½ inches in diameter. *Peduncle* strongly deflexed. Exposed end of each berry dirty light green, very obtusely conical with irregular radiating ridges; sides thin and translucent. Three syncarps had 102, 114 and 118 berries; the berries mostly 1-seeded, a few 2-seeded and about 25% empty. *Seeds* ovoid, about ¼×⅓ in., dark purple with about 25 deep longitudinal furrows, tip blunt-pointed, base slightly flattened. Of 56 inflorescences 40 had the arc-shaped crack convex to the right and the twist of the limb in a left-handed screw; the rest were reversed. Growing in marsh at Tenmalai, Travancore, about 1000 ft. Dec. 1933, E. Barnes 644, 647, 654."

Kew specimens: Travancore: Quilon, Wight 2770 and in Wall. Cat. 8966B; Pallode, in evergreen forest of low country, frt. Feb., M. Rama Rao 816; Alleppi, fls. Nov., A. Meebold 12802; without precise locality, C. C. Calder and M. S. Ramaswami 1546. Coorg, Heyne in Wall. Cat. 8966A. Cochin: Perambicolum, young frt. Nov., A. Meebold 12423. Coimbatore-Cochin frontier at Palakadavu, 1700 ft. April, C. E. C. Fischer 3365.

Lagenandra toxicaria Dalz.

"*Rhizome* up to 0.95 in. diameter, green, roots orange-red. *Stipular sheaths* up to 5½ in. long, 2-keeled. *Leaves*; blades 7½–8½×3¼–3½ in., edges frilled; petioles up to 12 in. long, cylindrical somewhat flattened on front. *Peduncles* 2 in. × ⅓ in., flattened. *Spathe* flesh-coloured to brownish-buff outside with a number of faint purple longitudinal striations on the lower half; long tail curved to a very open "S" and up to 4½ in. long. Opening of limb in the form of an arc. Inside surface of limb of spathe rich-purple, covered with numerous transverse ridges fringed with mossy growth, white at the tips. Lower part of the limb with a

yellow convex spongy mass round the opening of passage to the chamber. Walls of chamber smooth with purple longitudinal rulings on a light background. Material of spathe on dissection very coarsely cellular. The valve on the lower part of the passage shaped like half the shell of a bivalve with pale purple concentric rings on a flesh coloured ground. Ovaries in a spherical mass, bright yellow with a red flush and a red network defining the individuals. Male flowers form a yellow truncated cone with the base downward. Spadix between the two sets of flowers reduced to a slender white rod. Of 33 inflorescences examined 17 had the arc-shaped opening convex to the left and 16 to the right. Syncarp 1 in. diameter. Exposed ends of berries dark-green, thick, very bluntly conical, irregularly and deeply furrowed, sides thin, white, translucent. Of 3 syncarps examined one had 69 berries with 240 seeds with an average of 3.5 per berry (7 were empty), the next had 60 berries with 170 seeds, average 2.8 and the third had 60 berries. The seeds are like caraway seeds to the naked eye, and are attached at the base of the cell and often remain attached to the peduncle when the berry is pulled off. They are dark-purplish, becoming dark-green in places with about 15 ridges with short scattered white hairs; apex bluntly pointed, base rounded.

This plant appears to resemble *Lagenandra Meeboldii* (Engl.) C. E. C. Fischer in size of rhizome and shape of leaves but differs in the much longer tail to the spathe, 2-keeled cataphylls, peduncles over 1 in. long and not slender, the spathe being flesh-coloured to light-brown (in shape and colour suggesting a pale tamarind pod) and the ridged and fringed inside wall of the spathe limb.

Growing on the margins of the Kalduritty stream near Tenmalai, Travancore at about 1000 ft."

Specimens at Kew; S. Konkan, fls. Feb., *Dalziel*; N. Kanara, immature fls. March, *W. A. Talbot* 8877; without locality *Stocks* in Madras Coll. 61. Travancore: Kalduritty Stream, Tenmalai, 1000 ft., fls. Dec., *E. Barnes* 638, 639, 640, 641, 643, 804; fls. and frt. March, *E. Barnes* 1000, 1001, 1002, 1003."

***Oxytenanthera nigrociliata* Munro var. *Hohenackeri* C. E. C. Fischer.** var. nov. [Gramineae]; a forma typica foliorum vaginis truncatis rigide ciliatis, spiculis omnibus partibus minoribus recedit.

Spikelets 11-12 mm. long. Glumes 2-4, the lowest 2.5-4 mm. long, the uppermost 5-6 mm. long. Lemmas usually 4, the lowest 7-7.5 mm. long, the uppermost 9.5-11.5 mm. long. Grain subulate, blunt, 6.3-8.7 mm. long.

Coorg, near Mercara, *Hohenacker* 527 (type in Herb. Kew.). S. Kanara, without precise locality, *Rhodes Morgan* (in Herb. Madras.) and *G. F. F. Foulkes* (in Herb. Kew.).

In his description of the species in Trans. Linn. Soc. 26 128 (1868) Munro quotes the sheet of Hohenacker referred to, above and gives the locality as "Madras, Canara, Mercara." This sheet

is in the Kew Herbarium. Attached to it is a note in Munro's own hand which reads: "This is so exactly like a specimen collected near Moulmelyn by Falconer in 1849 that I cannot help thinking this label is accidentally placed here. I have never seen any specimen from the continent of India. I have never seen any other specimen with ciliated ligules and do not think that these leaves belong to the flowers. I have however quoted Hohenacker's number."

In his monograph on the *Bambuseae* of British India in Ann. Bot. Gard. Calc. 7, 69 (1896), Gamble states under this species: "Said to occur also in Coorg and Canara, but this requires further investigation; the specimens were collected by Hohenacker and by no one else."

The Hohenacker sheet consists of a small twig bearing 2 rather small leaves and 3 separate spikes, the longest being about 43 cm. long; the clusters of spikelets do not exceed 6 individuals.

Mr. Rhodes Morgan's sheet has 4 spikes, the spikelets numerous in the clusters; no leaves.

Mr. Foulkes' 5 sheets contain twigs with several mature leaves and numerous detached spikelets in capsules, which agree with those on the Hohenacker sheet. These sheets were identified as "*Oxytenanthera Thwaitesii* Munro," by Mr. Foulkes, but on one of them Mr. Gamble has written in pencil on the 12th Dec., 1912, "I do not feel at all sure about the identification of this."

Mr. Foulkes assures me that the bamboo was truly wild and not cultivated and believes that he found it "at the foot of the Ghats in the Uppinangadi Taluq."

No culms or culm-sheaths are available, nor inflorescence connected with the leaves. It is possible that these specimens should be described as a distinct species, but until more complete material is available, it is preferable to treat them as above.

VII—MISCELLANEOUS NOTES.

SIR DAVID PRAIN.—At the twenty-ninth annual meeting of the Botanical Society of America at Pittsburgh, on December 27th, Sir David Prain, C.M.G., F.R.S., was elected a Corresponding Member.

JOHN FRASER.—The death of Mr. John Fraser, V.M.H., F.L.S., a week before his eighty-first birthday removes a figure well-known to horticulturists and botanists familiar with the activities of the Royal Horticultural Society and of Kew.

Fraser was born on 31st January, 1854, at Newdeen, 15 miles from Fraserburgh, Aberdeenshire, and was the eldest of a family of seven children. He commenced his horticultural and botanical career in 1874 and continued his studies in Scotland for about five and a half years. In February, 1880, he joined the staff of the Royal

Horticultural Society, at the old Chiswick gardens. About two years later he moved to Kew where for a time he was in charge of the Rock Garden and later of some of the glasshouses. In 1885 he commenced work in the Jodrell Laboratory on behalf of Sir John Lubbock, afterwards Lord Avebury. Much, if not most, of the detailed research underlying Lord Avebury's classical publications on seeds, seedlings, buds, stipules, pollen, and other botanical subjects, was done by Fraser, whose connection with Lord Avebury lasted till 1912. He became Assistant Editor of the "Gardening World" in 1887 and was Editor from 1895 to 1909. He wrote or contributed to several well-known horticultural works, including the 1917 edition of "Johnson's Gardeners' Dictionary." He was also a prolific, and often anonymous, writer to various horticultural and botanical periodicals. He had a detailed acquaintance with many groups of cultivated plants, especially with potatoes and the genus *Pelargonium*.

In addition to his wide experience of gardening, and his work for Lord Avebury, Fraser had an intimate knowledge of British plants, both in the field and in the herbarium. He was a frequent visitor to the Herbarium at Kew, where he made extensive use of the plant collections and the library. In his later years he specialized on the difficult genera *Salix* and *Mentha*, on which he became a recognised authority, and published valuable accounts. Most recently he returned to the study of seedlings, and had accumulated a beautifully preserved and mounted set of the early stages of growth of some hundreds of British species.

Fraser died in Charing Cross Hospital on 24th January, 1935, from pneumonia, following injuries from being knocked down by a cyclist while crossing Kingsway a week earlier, and is buried in Richmond cemetery. His herbarium of about nine thousand sheets, rich in Scottish plants and in the genera on which he specialized, and his manuscript notebooks, have been presented, at his written desire, to the Royal Botanic Gardens, Kew, by members of his family. He was elected a Fellow of the Linnean Society in 1889. The Royal Horticultural Society awarded him the Victoria Medal of Horticulture in 1922 and the Veitch Memorial Medal in 1929.

Fraser was a very modest and retiring character, but he was always most willing to help any who sought for information on botanical or horticultural subjects. His friends will miss his kindly aid and will treasure the remembrance of a courteous gentleman who combined with independence of character the rare ability of never hurting the feelings of others.

W. B. TURRILL.

WALTER E. BROADWAY.—We learn with regret of the death on January 1st of Mr. W. E. Broadway, M.B.E., for many years associated with horticultural and agricultural work in the West Indies. Mr. Broadway was a student at Kew, leaving in 1888.

In 1894 he was appointed Curator of the Botanic Gardens in Grenada, where he remained until 1903, when he set up as a nurseryman in the same island. In 1910 he was appointed Curator of the Botanic Station at Tobago, and in 1915 Horticulturist and Assistant Botanist in Trinidad, retiring in 1922. He was awarded the M.B.E. in 1934.

It is as a botanical collector that Broadway will be best remembered by botanists in many parts of the world. He was probably the most considerable collector there has ever been in Trinidad and Tobago, and his name is associated with very many new species described at Berlin by the late Prof. Urban. Kew constantly received parcels from him, both as gifts and by purchase, but we have not nearly a complete representation of his collections. The best set is at Berlin, while others are at the British Museum, Stockholm and the New York Botanical Garden. In 1921 he undertook a collecting expedition to French Guiana on behalf of the United States National Museum, the Gray Herbarium, and the New York Botanical Garden. In 1933 he published, jointly with Dr. Lyman B. Smith of the Gray Herbarium, an account of the *Bromeliaceae* of Trinidad and Tobago, see Contr. Gray Herb. **102**, 152–188. Were it not for Broadway's large and continuous series of collections the vegetation of Trinidad and Tobago would still be far too incompletely represented in Herbaria, and his name appears on nearly every page of the Flora of these islands which is now in course of publication.

N. Y. SANDWICH.

C. S. ROGERS.—We record with regret the death on December 9th last of Mr. C. S. Rogers, late Forest Officer in Trinidad and Tobago.

***British Guiana Timbers.**—The value of this book to foresters, timber merchants and manufacturers cannot be estimated from its size, for, although it only runs to 73 pages, it is full of the kind of information required by those engaged in the exploitation of timber.

Reference is made in the preface to the timber requirements of Great Britain and the part British Guiana is prepared to take in filling the demand. On page 11 some particulars are given of the position of the principal forests in British Guiana and the climatic conditions of the country. The topography of the forest lands, the estimated amount and accessibility of available timber, and methods of exploitation are then dealt with. The author considers that a good deal of the best timber could be extracted by means of a logging railway 16 miles long at a cost of £35,000, with rolling stock capable of dealing with 500 tons of timber per day at an additional cost of £12,000. Timber drying methods are described

* By Gerald O. Case, F.S.E., Consulting Engineer. Metcalfe & Cooper, Ltd., Wool Exchange, London, E.C.2. 1934. Pp. 73. Illustrations 2. Price 7s. 6d.

with illustrations of drying sheds. Markets and possible markets are discussed and comparisons made between the forests of British Guiana and those of other countries. Descriptions are given of the most important timbers, amongst which greenheart, wallaba, purple-heart, crabwood, mora, bullet wood and cedar are prominent. Tables of strength tests are included, and the uses of British Guiana timbers are discussed at length under the headings: furniture, joinery, boat-building, railway sleepers, flooring, staircases, fire-resisting timbers, paper-making, marine and river work, ship-building, motor-car bodies, etc. The manufacture of charcoal also receives attention. At the end of the book 104 kinds of trees are referred to under their common names with the average number of trees occurring per square mile. Wallaba heads the list with 3,808 and greenheart is second with 1,942.

W. DALLIMORE.

Scolt Head Island.*—In view of the many articles and scientific papers which have been published on the geography and biology of Blakeney Point in Norfolk, it is interesting to read this account of the neighbouring and very similar area of Scolt Head. The book consists of a number of chapters dealing with various aspects of the island and its natural history, written by different contributors and edited by Mr. J. A. Steers, the whole providing a preliminary account which must not be considered in any way complete or final.

The two most important sections deal with the Physiography and Evolution of the Island, written by the Editor, and the Plant Ecology, contributed by Mr. V. J. Chapman. Other chapters deal with the Petrology of the Beach Pebbles, Pollen Analyses of Peats, the Bryophyta, the Lichens, the Mammals, the Breeding Birds, the Marine Invertebrate Fauna, the Non-Marine Mollusca, and Geographical Problems. There is also a list of all the plants so far recorded in the form of an Appendix.

Altogether the book provides an interesting account of our present scientific knowledge of a well-defined and characteristic maritime area. It is very satisfactory to realise that the island is controlled by the National Trust and that consequently every facility is being provided for the active continuation of scientific work along the lines already indicated.

* Scolt Head Island. The Story of its Origin: The Plant and Animal Life of the Dunes and Marshes. Edited by J. A. Steers. Pp. xvi + 234, 34 plates, 17 text figures and 1 map. W. Heffer & Sons, Ltd., Cambridge, 1934. Price 15s.

BULLETIN OF MISCELLANEOUS INFORMATION No. 3 1935 ROYAL BOTANIC GARDENS, KEW

IX.—OBSERVATIONS ON THE GENUS *COMMIPHORA* AND ITS DISTRIBUTION IN TANGANYIKA TERRITORY.

B. D. BURTT. (Survey Botanist, Department of Tsetse Research, Tanganyika Territory).

The genus *Commiphora* is still poorly represented in European herbaria, the material being often no more than featureless and leafless twigs. This is regrettable considering the importance of the genus in the African savannahs and the wide range of altitude and climate in which the many species are found. But their collection and preservation for herbarium purposes is usually a matter of some difficulty, because of their spiny nature, the irregular method of branching of many species, and the more or less resinous sap which causes the leaves to fall off during drying.

Owing to the lack of good material, therefore, our knowledge of *Commiphora* is quite inadequate for the preparation of a monograph or even a revision of the genus. Several species have never been re-collected since they were first described, whilst the status and distribution of many is a matter of conjecture. To this purpose much more material, with adequate descriptive and ecological notes, is needed.

For the past nine years the writer has lived in those savannah areas of Tanganyika Territory which lie to the north of the central railway where he has been acquiring information relating to the habitat and bionomics of the tsetse fly (*Glossina* spp.). During that time he has had much opportunity of collecting and studying *Commiphora* in the field, and it is hoped that the following brief account will stimulate others to do likewise and help to fill up the gaps in our knowledge of this important and interesting genus.

Several contributions have been made to our knowledge of *Commiphora* since Engler published his monograph and key to the species in 1912 (Engl. Bot. Jahrb. 48, 451), which dealt with 129 species and 10 varieties. Engler himself added 6 more species, 4 of them from Northern Nyasaland (Engl. Bot. Jahrb. 54, 292 : 1917). Sprague and Chiovenda have described 17 new species from British and Italian Somaliland, whilst other contributions include a new species from West Tropical Africa, and 2 from the Transvaal, bringing the total number of described species to 160, with 11 varieties.

Unfortunately some of the descriptions of *Commiphora* have been built up from single and inadequate collections, whilst in more



than one instance new species have been described from young and immature specimens (*C. ndemfi*, *C. pilosissima*, *C. subsessilifolia*, etc.). In addition, subsequent observation has shown that much diversity of leaf-form exists, even on the same tree, a point recognised by Engler, and forming the basis of one of the principle groups of the genus, namely, the *Heterophyllae*. Engler, however, owing to the lack of material at his disposal, described several which have proved to be leaf-forms of the same species, while in some cases he has unfortunately mistaken for *Commiphora* plants belonging to the *Anacardiaceae* and *Combretaceae*. These are enumerated at the end of this paper (see p. 116).

Variation in species of *Commiphora*.

Commiphora Stuhlmannii Engl. (*Pflanzenw. Ostafrikas* C, 230, (1895) is a widely distributed plant on "hard-pan" soils and termite-mounds in the Central Lake and Tabora Provinces. Considerable variation of leaf-form is revealed in this species, which, in the Shinyanga District specimens (Burt 3999) matches the 4-jugate leaf-form collected by Stuhlmann 3450 from "Usindscha." The Shinyanga specimens show leaves with 2-6 pairs of pinnae, 4-5 pairs of leaflets predominating; moreover, leaves with elliptic-acute and ovate leaflets are found on the same tree. *Commiphora Krausei* Engl. (*Engl. Bot. Jahrb.* 44, 152 (1909), from Tabora, Trotha jr. 8a, also matches the Shinyanga plant and is undoubtedly *C. Stuhlmannii*.

In the Central Province *C. Stuhlmannii* usually has 2-3 pairs of leaflets and is matched by *C. Boehmii* Engler (*Engl. Bot. Jahrb.* 48, 472 (1912)). Engler describes his type of *C. Boehmii* from immature leaf material, and states that the young leaves are "dicht weisslich behaart," a characteristic of immature *C. Stuhlmannii*; moreover one specimen cited by Engler in the original description was collected from Saranda, in the Manyoni District, by Fischer no. 292.

The following recent collections of *C. Stuhlmannii* have been made:—Lake Province: Shinyanga, mature leaves, Burt 3286, 3999; Mwanza, a large shrub, vernacular "Kungulu," Swynnerton 228. Central Province: Kondoa, Simbo Hills, flower and young leaves, 12.12.1927, Burt 811; Kondoa, hills near aerodrome, leaves and fruits, 10.4.1928, Burt 1629; Kondoa town, Burt 1444; Kondoa, at Sambala, in leaf, 27.3.29, Burt 2086; Sambala, leaf and fruits, 10.4.29, Burt 1991; Bubu Valley, near Narai, flowers and twigs, 8.11.1927, Burt 690; Singida District, near Wimban Steppe, flowers and twigs, 9.10.1927, Burt 1626; Matelele, young leaf and flowers, 27.9.27, Burt 726, 1631; Mwapwa District, Kikombo, leaves, 17.4.32, Burt 3958; near Nzuhe Lake, flowering 26.11.33, Burt 5046; Kazikazi, fruiting 28.7.32, Burt 1923.

Several species of *Commiphora* occurring in Tanganyika Territory show much similarity to one another, and more material available

for comparison may prove the existence of further synonymy; these are:—

<i>C. zanzibarica</i> (Baill.) Engl.	& <i>C. spondioides</i> Engl.
<i>C. Boiviniana</i> Engl.	& <i>C. morogorensis</i> Engl. & <i>C. pilosissima</i> Engl.
<i>C. Fischeri</i> Engl.	& <i>C. Stolzii</i> Engl.
<i>C. kyimbilensis</i> Engl.	& <i>C. puguensis</i> Engl.
<i>C. subsessilifolia</i> Engl.	& <i>C. salubris</i> Engl.
<i>C. pilosa</i> Engl.	& <i>C. rugosa</i> Engl. & <i>C. rubriflora</i> Engl.
<i>C. mollis</i> Engl.	& <i>C. ndemfi</i> Engl.

The following species from Tanganyika Territory have apparently never been re-collected since their description:—

<i>C. glabrata</i> Engl., Bagamoyo, Holtz 1193.
<i>C. iringensis</i> Engl., Uhehe, Spiegel. 2507.
<i>C. ndemfi</i> Engl., Bulambya, Stolz 1678.
<i>C. kyimbilensis</i> Engl., Kyimbila, Stolz 1699, 1665.
<i>C. pilosissima</i> Engl., foot of Pare Mts., Engler 1563.
<i>C. puguensis</i> Engl., Pugu Hills, Holtz 1083.
<i>C. rugosa</i> Engl., foot of Pare Mts., Engler 1580.
<i>C. salubris</i> Engl., Kyimbila, Stolz 1683, 1769.
<i>C. serrata</i> Engl., Dar-es-salaam & Ruaha, Hildebrandt 1251.
<i>C. Stolzii</i> Engl., Kyimbila, Stolz 1725.
<i>C. Trothai</i> Engl., Usambara region, Trotha 233.
<i>C. ulugurensis</i> Engl., Ruaha, Rufiji, Ruvu area, Stuhlmann 8974.

Of the above *C. kyimbilensis*, *C. salubris*, *C. serrata*, and *C. Stolzii* are represented by well collected material; on the other hand the type material of *C. pilosissima*, *C. rugosa* and *C. ulugurensis* is so poor and inadequate as to be almost useless for comparison.

Specimens collected from the Central Provinces of Tanganyika, Burt 844, 902, 1622, 1623, 1922, 1931, 3986, closely resemble Stolz's specimens of *C. kyimbilensis*, but may prove to be new; while bijugate forms of *C. Fischeri* Engl., Burt 2729, from Kondoa District, 3988, from Shinyanga, and Lynes 1 h. 48, from Iringa, closely resemble *C. Stolzii*.

Notes on the collection and preservation of *Commiphora*.

Specimens of twigs with leaves, sufficient for about six herbarium sheets, should be collected and pressed in two separate presses, which should then be laid out in the hot rays of the sun. The drying paper should be changed every morning without fail, for by this method the leaves do not fall off and break up, as they do when the specimens are dried slowly among a large collection of other plants.

In the case of very spiny species, crushing between cardboard has been found satisfactory, a method which obviates the use of drying paper (also a very satisfactory method with gall and other *Acacia*).

PLATE I.

In addition to specimens of twigs, a number of leaves should be collected and dried separately to show their outline and to increase the available leaf-material which is often scanty on the twigs.

The minute flowers usually appear with the early rains, when the leaves are either absent, or in a very young and immature condition; they should be collected separately, in as large a quantity as possible, and placed in a packet with adequate descriptive and ecological data.

Samples of bark should be sliced off and dried with notes stating whether the sap is pine-scented or scentless.

Fruits usually ripen long after leaf-fall has taken place; they should be dried and stored in cardboard boxes with naphthaline to prevent insect ravage; when possible a drawing of the fruiting axis should be made, together with the seed and aril, whilst notes on the colour of the latter would be useful.

Distribution of Commiphora.

The genus is very largely African, as only eleven species are recorded outside that continent; of these, two occur in Arabia, two on the island of Socotra, six in India and one in Baluchistan.

Commiphora is found throughout the continent of Africa. A summary of distribution which is open to revision as our knowledge increases has been compiled from records found in literature and recent material which has accumulated at Kew, the British Museum (Natural History) and the herbarium of the Imperial Institute of Forestry at Oxford; this shows *Commiphora* to be distributed in Africa as follows:—

West Trop. Africa ...	...	7 species.
Cameroons and Congo ...	...	6 "
North East Trop. Africa ...	...	41 "
British East Africa ...	...	51 "
South Trop. Africa ...	...	28 "
Mascarenes ...	...	4 "
South Africa ...	...	27 "

Dispersal.

The fruit of *Commiphora* is a drupe with a single nut-like seed surrounded by an epicarp. When ripe this outer coat becomes red or pink and attractive to birds. To the seed is attached a fruity and bright coloured aril varying in size and form according to each species—the usual colour is crimson, but in *C. Merkeri* and *C. Swynnertonii* the aril is yellow, and in *C. laxiflora* pink. The ripe fruits are much sought after by various fruit-eating birds, especially the grey Turaku and various pigeons and doves. Seeds of *C. ugogensis* are stored by small rodents, and many kernels have been found with the marks of teeth of these animals on them. The seeds of *C. Stuhlmannii* have frequently been observed in the droppings of turtle doves, some distance from the parent plants.



C. stolonifera B. D. Burt
Showing vegetative reproduction by stolons. Manyoni.



C. stolonifera B. D. Burt
Showing thicket produced by a single plant; dry season. Mpwapwa.

As birds are the principal agents of dispersal of *Commiphora*, one would expect the plants to be widely distributed in Tropical Africa ; however, it will be seen in the next paragraph how much *Commiphora* is limited by edaphic and climatic factors which greatly restrict the range of several species.

Distribution of Commiphora in Tanganyika Territory.

In Tanganyika Territory, the genus *Commiphora* ranges from the coastal belt, where *C. lindensis* Engl. is to be found along the borders of tidal mangrove swamps, throughout the vast areas of deciduous savannah woodland and desert thorn scrub of the central plateau to 6,500 ft. in the Mbulu District, where a species allied to *C. kymbelensis* Engl. marks the highest range of the genus in the Territory.

Commiphora is most conspicuous in the areas of 20–25 inches rainfall between 2,000 and 4,000 ft., and especially in the “insulation basins” (St. Clair Thompson), or “sunk-lands” of the Eyassi-Wembare Steppe, Lake Natron ; the Gulwe and Rukwa Valleys, the Kilimatindi, and parts of the Massai Steppe. In these regions the annual rainfall is only about 18 inches.

Commiphora Fischeri Engl. and *C. pilosa* Engl. have the widest distribution in the Territory, though the former is absent from the coastal regions ; they usually grow on alluvial slopes in the company of *Combretum Zeyheri*, *C. apiculatum*, *Terminalia sericea*, *Brachystegia edulis*, *B. itohensis*, *Isobertinia globiflora* and *Ostrya oderris Stuhlmannii*. This plant community forms the deciduous woodland and is the principal habitat of the Tsetse Fly, (*Glossina morsitans*). *C. ugogensis* Engl. (Photo. 3 and 4), a fine tree, affects the same habitat as *C. Fischeri* and *C. pilosa*, but is limited to the Central, the Lake and Western Provinces.

The largest species in Tanganyika is *Commiphora Zimmermannii* Engl. which resembles an ash-tree in form and grows to 50 or 70 ft. in height. This plant is confined to rocky gorges in tropical rain forests and is recorded from the Wambara, Nguu, Kaguru and Uluguru Mts., while Haarer (No. 1759) has collected *C. Zimmermannii* from 4,500 ft. on Kilimanjaro.

Vast tracts of country such as the margin of the Wimbare Steppe, extending into the Districts of Nzega, Tabora, Shinyanga, Mwanza, Maswa, Musoma and much of the Massai Steppe are composed of a greyish alluvial sandy-clay, known locally as “hard-pan” or “semi-mbuga” (the “seepage-glades” of Jackson also belong here). The hard-pan country is clothed with “thorn-scrub” interspersed with open grassland, in which *Acacia* spp. and *Commiphora* spp. are co-dominant and form the potential habitat of the Tsetse fly (*Glossina swynnertonii*), and the home of many kinds of game including Rhinoceros, Elephant, Giraffe, Zebra, Eland and Impala.

Where “hard-pan” soils occur are found *Commiphora Schimperi* Engl. and *Lannea humilis* Oliv. in profusion, while everywhere are

small island-thickets varying from 2-30 yards in diameter, often centred round the nucleus of a termite mound. In these island-thickets are usually to be found *Commiphora subsessilifolia* Engl., and *C. Stuhlmannii* Engl. (*C. Boehmii* Engl.) growing out from the termite mound itself; *C. sarandensis* Burtt, with white straggling branches and foliaceous leaves growing in the centre of the thicket; *C. stolonifera* Burtt in the outer fringe of the thicket where the soft sappy branches of this species act to some extent as a protection from the seasonal grassfires. The remarkable blue-green-barked tree, *C. caerulea* Burtt, is often found in *Commiphora* thickets of the Central Province.

Where rocky hills or steep escarpments are found in the Central Plateau of Tanganyika we find another home of *Commiphora* usually of the *C. kimbilensis* group, with characteristic grey and fluted trunk. *C. laxiflora* Engl. (Photo 7), with yellowish-green bark, is seen less frequently, while *C. Eminii* Engl., with waxy pale-green foliage and deeply fluted trunk occurs along the fantastic outcrops of granite which form the coastline of the Speke Gulf of Lake Victoria, the Montini and Usanda Hills of Shinyanga District.

Several species of *Commiphora* are exceedingly local in their distribution and confined to areas of low rainfall; for example *C. Hornbyi* in the Kidete-Gulwe valley of Mpwapwa District; *C. Merkeri* Engl., a species co-dominating with *C. Hornbyi*, has been recorded from Engaruka in the Natron region and south of Dodoma, and *C. Swynnertonii*, with remarkable shining yellow-green bark, from the Kilimatindi plains and South-east Massailand.

The Economic Value of Commiphora in Tanganyika.

Commiphora Zimmermannii Engl., the "mbungwa" of the Usambara natives, yields a light straight-grained timber which takes a dark polish; it is however, not exploited.

C. Fischeri, *C. pilosa*, *C. Schimperi*, *C. subsessilifolia*, *C. Stuhlmannii* and *C. ugogensis* Engl. are important constituents of the vast deciduous savannah woodlands which form the habitat of the two Tsetse flies *Glossina morsitans* and *G. Swynnertonii*—it has been shown by Mr. Napier Bax of the Tsetse Research Department that *C. Fischeri* and *C. pilosa* are completely killed by Termite-attack when the base of the tree is "filled" and earth piled round the injury. In this way valuable economic assistance is given to bush cleaning in anti-tsetse measures.

The soft sappy wood and clean straight stems of *C. pilosa*, *C. Schimperi* and *C. subsessilifolia* are much sought after by natives and game-scouts for the construction of gun-traps and drop-traps for the destruction of troublesome leopard and lion.

The remarkable manner in which all *Commiphora* poles take root when planted in the ground has made them invaluable to the native cattle owner for the construction of live-pole fences for the cattle-kraals. The Tsetse Research Department has been experimenting with live-pole fences for game control purposes.

PLATE II.



C. ugogensis Engl.
Mature trees at Manyoni ; dry season aspect.



C. ugogensis Engl.
Showing flaking bark.

Stools and spoons are carved from the wood of *C. ugogensis* by natives, while the Wagogo tribe carve useful milk-bowls from this wood.

A small and troublesome "mellipona bee," the "sweat bee," frequently nests in holes of *Commiphora*, the honey made by these bees being much sought after by natives.

The remarkable *C. stolonifera* Burt, with its spiny branches and stolon reproduction, suggests an admirable live-fence plant on hard-pan soils.

So far, there is no record of the gum which exudes from *C. Merkeri*, *C. Schimperi*, *C. Fischeri* and *C. kyimbilensis*, being used for any particular purpose.

New Species of Commiphora in Tanganyika Territory.

Five new species are now described for the first time ; they are *C. caerulea*, Photos. 5 and 6, *C. Hornbyi*, *C. sarandensis*, *C. stolonifera*, Photos. 1 and 2, and *C. Swynnertonii*.

There are a number of specimens of *Commiphora* still unidentified which may prove to be new when more material is available for comparison ; these are—Burt 4964, 1926, from South East Massailand in the Handeni District, which resembles *C. Scheffleri* Engl. from Kibwesi, Scheffler 171. The leaves and flowers of the Tanganyika plant have not yet been collected, the fruit is sessile, while Scheffler's specimen has a well developed stalked inflorescence.

Another remarkable plant is allied to *C. Schimperi* Engl. but has a shrubby habit, only growing to 6 ft. high. This plant is extremely plentiful in S.W. Massailand, in the Kidete Valley of Mpwapwa District (Burt 4962, 4960, 4963, 3994, and 4805).

A specimen collected by Lynes V8, from Njombe, has affinities with *C. kyimbilensis* Engl. but has only 2-3-jugate leaf. Lynes describes this plant as a tree 25 or more feet high occurring near a waterfall.

Alphabetical List of Species of Commiphora occurring in Tanganyika Territory.

Species	Observations
1. <i>C. baluensis</i> Engl.	W. Usambara, re-collected at Kibwesi (Battiscombe 906 ; Rammell 2738).
2. <i>C. Boiviniana</i> Engl.	Coastal. Inland plants are allied to this species.
3. <i>C. caerulea</i> Burt	Common in Central Province, hard-pan thickets.
4. <i>C. campestris</i> Engl.	Common at Wimbare and Shinyanga ; in " salt-steppe."
5. <i>C. chlorocarpa</i> Engl.	Rufiji, a common Rhodesian plant.

Species	Observations
6. <i>C. edulis</i> Engl.	Kyimbila (<i>Stolz</i>) ; common southern plant.
7. <i>C. Eminii</i> Engl.	Common at Shinyanga and S. Coast Lake Victoria hills.
8. <i>C. Fischeri</i> Engl.	Very common.
9. <i>C. glabrata</i> Engl.	Bagamoyo ; not re-collected.
10. <i>C. Hornbyi</i> Burt	Locally common Kidete-Gombo valley near Mpwapwa.
11. <i>C. iringensis</i> Engl.	Uhehe ; not re-collected.
12. <i>C. kyimbilensis</i> Engl.	Not re-collected ; specimens from Central Province allied to this species.
13. <i>C. laxiflora</i> Engl.	Central Province and Shinyanga.
14. <i>C. lindensis</i> Engl.	Common Coastal plant.
15. <i>C. Merkeri</i> Engl.	Locally common in the Gombo-Kidete Valley and foot of Oldeani and Engeruka.
16. <i>C. mollis</i> Engl.	Morogoro, common southern species.
17. <i>C. ndemfi</i> Engl.	Kyimbila ; not re-collected and probably young material of <i>C. mollis</i> Engl.
18. <i>C. pilosa</i> Engl.	Very common and widely distributed.
19. <i>C. pilosissima</i> Engl.	Foot of Pare Mts.; not re-collected, probably a form of <i>C. Boiviniana</i> .
20. <i>C. pteleifolia</i> Engl.	Common coastal species in thickets.
21. <i>C. puguensis</i> Engl.	Pugu Hills ; not re-collected ; allied to <i>C. kyimbilensis</i> Engl.
22. <i>C. rugosa</i> Engl.	Foot of Pare Mts.; not re-collected ; probably a form of <i>C. pilosa</i> Engl.
23. <i>C. salubris</i> Engl.	Kyimbila (<i>Stolz</i>) ; not re-collected, probably a form of <i>C. subsessilifolia</i> Engl.
24. <i>C. sarandensis</i> Burt	Common Central Province and Shinyanga, in hard-pan thickets.
25. <i>C. Scheffleri</i> Engl.	Kibwesi-Kenya ; plant from Handeni Massailand near this species.
26. <i>C. Schimper</i> Engl.	Common Central Province, most likely widely distributed.
27. <i>C. serrata</i> Engl.	Dar-es-salaam and Ruaha, not re-collected since German times.
28. <i>C. stolonifera</i> Burt	Common Central Province and Wembare region.
29. <i>C. Stuhlmannii</i> Engl.	Very common in Central and Lake provinces.
30. <i>C. Stolzii</i> Engl.	Kyimbila (<i>Stolz</i>) not re-collected ; probably form of <i>C. Fischeri</i> .

Species	Observations
31. <i>C. subsessilifolia</i> Engl.	Common Central, Lake and Tabora Provinces.
Trifoliolate form	Local Central province ; where normal species is overshadowed.
32. <i>C. Swynnertonii</i> Burt	Locally common Kilimatindi ; Dodoma, Mpwapwa and S.W. Massailand.
33. <i>C. Trothai</i> Engl.	Pare and W. Usambara, not re-collected since German times.
34. <i>C. ugogensis</i> Engl.	Very common, Central, Tabora and Lake Provinces.
35. <i>C. ulugurensis</i> Engl.	Rufiji, Morogoro, a doubtful plant, not re-collected.
36. <i>C. zanzibarica</i> (Baill.) Engl.	Locally common coastal thickets.
37. <i>C. Zimmermannii</i> Engl.	Common in Rain Forest Rarineo ; Uluguru ; Nguu, Usambara, etc.

For citation of Engler's species see Engl. Bot. Jahrb. **48**, 451 (1912) ; and **54**, 292 (1917).

Field Key to the commoner species of Commiphora in Tanganyika Territory.

Commiphora species are readily distinguished from one another in the field by their characteristic appearance, such as spininess, colour of bark, scent of sap, whether tree or shrub, etc.—in many cases their appearance together with the habitat in which they occur, will give a fairly good indication of species.

For the assistance of those in the field, a Field Key has been devised which readily distinguishes 24 of the best known species in the Territory, and it is hoped that by the use of this the less known species, which are not included in the Key, will be brought to light.

Species of *Lannea* may be mistaken for *Commiphora* ; in the field, however, the two are readily distinguished from one another, as all twigs of *Commiphora* are brittle and snap when bent, while *Lannea* twigs contain much fibre (" Kamba," vernacular for string), and may be bent in any direction without snapping.

1. (a) Shrubs 2.
- (b) Trees 7.
2. (a) Stolon reproduction ; sap strongly resin-scented *C. stolonifera* Burt
- (b) Without stolon reproduction 3.

3. (a) Without spines ; bark silvery grey *C. sarandensis* Burt
 (b) With spines ; bark green with
 papery peeling 4.
4. (a) Bark bright yellow-green and shiny.
 leaves with brown tomentum....*C. Swynnertonii* Burt
 (b) Bark dull green ; leaves glabrous 5.
5. (a) Strongly resin-scented, leaf like
 C. Schimperi*C. Trothai* Engl. ?
 (b) Sap not resin-scented 6.
6. (a) Leaf fairly large, trifoliolate, on
 long stalk.....*C. pteleifolia* Engl.
 (b) Leaf small, simple or slightly tri-
 foliolate, on short stalk.....*C. lindensis* Engl.
7. (a) Bark bright blue-green, with white
 papery peel 8.
 (b) Bark green (often yellowish green)
 with straw coloured papery peel 9
 (c) Bark grey or brown, not as above 15.
8. (a) Sap strongly resin-scented, leaflets
 glabrous*C. Hornbyi* Burt
 (b) Sap unscented, leaflets with pube-
 scence of veins on under surface *C. caerulea* Burt
9. (a) Flat crowned tree (resembling
 Lannea humilis) ; sap vanilla
 scented.....*C. Scheffleri* Engl.
 (b) Not flat crowned trees, etc. 10.
10. (a) Sap pine-scented 11.
 (b) Sap not pine-scented 12.
11. (a) Trunk cylindrical ; leaf fresh green *C. Schimperi* Engl.
 (b) Trunk gnarled and fluted ; leaf
 grey-green with waxy bloom.....*C. campestris* Engl.
12. (a) Non-spiny ; leaf pinnate.....*C. laxiflora* Engl.
 (b) Spines on branches 13.
13. (a) Leaves pinnate, trunk with bark
 flaking off as well as peeling ;
 knobbly, medium-sized tree ;
 large fruits.....*C. ugogensis* Engl.
 (b) Leaves not pinnate ; small trees 14.
14. (a) Leaves pubescent, especially below,
 trifoliolate*C. pilosa* Engl.
 (b) Leaves glabrous, simple (or rarely
 trifoliolate)*C. subsessilifolia* Engl.
15. (a) Bark with conspicuous untidy
 papery peel 16.
 (b) Bark smooth, or, with only fine
 powdery peel 18.
16. (a) Bark with large untidy transverse
 lenticels*C. Merkeri* Engl.
 (b) Bark without conspicuous lenticels 17.

PLATE III.



C. caerulea B. D. Burt
Note peeling of bark on old trunk.
Near Mpwapwa.



C. caerulea B. D. Burt
Shewing smooth, whitish branches.
Kilimatindi.

17. (a) Bark grey with straw-coloured peel
leaves large, pinnate.....*C. zanzibarica* (Baill.)
Engl.
- (b) Bark with reddish-copper coloura-
tion ; leaves large, trifoliolate...*C. Fischeri* Engl.
18. (a) Trunk cylindrical*C. Boiviniana* Engl.
- (b) Trunk with conspicuous longitudinal
fluting 19.
19. (a) Small tree, branching near ground ;
branches spreading.....*C. Stuhlmannii* Engl.
- (b) Tall trees, usually with clean bole
to 10 ft. 20.
20. (a) Leaflets glabrous, with waxy bloom 21.
- (b) Leaflets with slight or pronounced
pubescence 22.
21. (a) Leaflets 5 pairs, on pronounced
stalks*C. Eminii* Engl.
- (b) Leaflets 3-4 pairs, on only slight
stalks*C. sp. nr. kyimbilensis*
Engl.
22. (a) Large rain-forest tree with large
serrate leaflets.....*C. Zimmermannii* Engl.
- (b) Small savannah tree ; small entire
leaflets*C. mollis* Engl.

Commiphora caerulea B. D. Burt, sp. nov. ; affinis *C. rosifoliae* Engl. sed nervis lateralibus paucioribus, reticulatione infra minus conspicuo differt.

Tree 3-15 m. high, with a regular spreading crown ; trunk up to 0.8 m. in diam. at 1.7 high, and often unbranched for 3.10 m. ; bark of trunk of older branches peeling off entirely every year about July, peel cream-coloured and papery ; before peeling, the trees have a distinctive pale milky-blue appearance at length changing to a rich blue-green colour ; sap of old wood watery and scentless. *Twigs* silvery-grey and spineless, clothed with greyish tomentum when young but this wearing off with age. *Leaves* and inflorescence borne at the ends of small stumpy lateral twigs which vary from 6 mm. to 5 cm. in length ; leaves 3-foliolate or pinnately 5-foliolate, both forms on the same tree ; leaflets elliptic and acute, with prominently serrate margin, clothed with grey indumentum on the lower surface and the rhachis, with only a few scattered hairs on the upper surface ; indumentum becoming greatly reduced with age especially on the upper surface which becomes shiny. *Inflorescence* appearing when the leaves are very young and either single and borne on a short peduncle or branched on a stalk about 2.5 cm. long clothed with a fine grey indumentum ; calyx densely pubescent ; petals pale yellowish-green and clothed with silvery indumentum outside. Fruit ripening in late July ; aril scarlet.

TANGANYIKA TERRITORY : between Mpwapwa and Tabugwe, in thicketed ravines in *Brachystegia microphylla*—*Isobertlinia globiflora* woodland, *B. D. Burtt* 3992 (type ; leaf specimen). Gulwe, near Mpwapwa, 2.1934, *H. E. Hornby* (flowers and young leaf). Kondoa-Irangi Distr., at Thlawwa in the Simbo Hills, 15.12.1927, *B. D. Burtt* 833 (flowers and young leaf). Hills above Kondoa-Irangi aerodrome, *B. D. Burtt* 1621. Near Kazikazi in Manyoni Distr., in *Acacia pallens*—*Commiphora* spp. thickets, *B. D. Burtt* 3997 (specimen of bark) ; Manyoni Distr., at Kilimatindi on the Rift Escarpment, *B. D. Burtt* 3342. Singida Distr., along the edge of the Wembare Steppe at Matelele, *B. D. Burtt* 1411. Shinyanga Distr., Shinyanga Kopje, tree to 10 m., 3.8.1931, *B. D. Burtt* 2915 (young leaves and flowers).

Trees of this species are usually conspicuous owing to the bright coloured bark ; they occur gregariously in thickets on hard pan soils ; specimens were seen by me but not collected on the Rift wall between Lake Manyara and Engaruka, in the Massai Steppe near Old Lolderobo and Makami.

The fruits ripen in late July, when the trees are leafless ; they take about 6 months to mature.

Commiphora Hornbyi *B. D. Burtt*, sp.nov. ; affinis *C. caeruleae* *Burtt*, sed ramis pendulis, cortice diu pallide flavo-viridi, succo resinoso differt.

Tree 3.3–11.6 m. high, with regular spreading crown ; trunk about 0.6 m. in diam. at 1.6 high ; bark of trunk and older branches peeling off annually about July, in large papery cream coloured pieces ; before peeling trees pale yellowish-green, afterwards changing to light blue-green ; sap of old wood, leaves and young fruit strongly pine-scented and of a resinous consistency ; twigs glabrous, silvery-grey, spineless. *Leaves* pinnately 5–7-foliolate, rarely trifoliolate ; leaflets elliptic, glabrous, with a slight waxy bloom when young, margin slightly serrate, lateral nerves inconspicuous ; petiolules 1–3 mm. long. *Inflorescence* glabrous, usually appearing in profusion before the leaves or when they are very young, borne on a peduncle 2.5–5 cm. long ; flowers appearing in early December with the first rains, 3–10 in number, borne on pedicels 5–7 mm. long, which arise from the same point as a number of filamentous bracts 3–5 mm. long ; petals honey-coloured, short, giving the flower a cup-shaped appearance. *Fruits* 1.5 cm. long and 1 cm. broad, oval, usually borne in pairs, ripening in April, the epicarp becoming damson-coloured.

TANGANYIKA TERRITORY : Mpwapwa Distr., at Gulwe, very common on red alluvial soil clothed with *Commiphora* spp. and *Cordyla africana*, 3.12.1933, *B. D. Burtt* 5008 (flowers) ; near Gulwe, 26.4.1932, *B. D. Burtt* 3965 (type). Mpwapwa—Gulwe thickets 24.4.1932, *B. D. Burtt* 3960 ; 3.12.1933, *B. D. Burtt* 5007 (flowers) ; 31.3.1932 (coll. by Mr. H. E. Hornby), *B. D. Burtt* 1934 (fruit).

PLATE IV.



C. laurifolia Engl.
Showing habitat among granite rocks;
flowering. Manyoni.



C. caudipetris Engl.
Sakalakwa, W. Wembere.

This closely resembles *Commiphora caerulea* Burt in the field but is distinguished by the young branches being more pendulous, the bark retaining its pale yellow-green appearance for a longer time, and the resinous consistency of the sap. It occurs commonly in the dry valley of the Gulwe-Gombo River as far as Kidete in the Kilosa District. It is associated with *Commiphora Merkeri*, *Commiphora caerulea*, *Commiphora Stuhlmannii*, *Cordyla africana*, *Delonix elata* and *Lannea Kirkii*, when the above species form extensive thickets on either side of the valley between 2,900 and 3,500 ft. The thicket near Kidete has been known to harbour the Tsetse flies *Glossina palidipes* and *Glossina austeni* in the leafy season.

Commiphora sarandensis B. D. Burt, sp. nov. ; affinis *C. Holtzianae* Engl. sed foliolis apice acutis nec cuneatis majoribus demum glabrescentibus differt.

A loosely-branched, straggling shrub rising to about 3 m. from a single, or several axes; stem 7-13 cm. in diam. at the base and usually forking near the ground; main branches few, straggling and supported by other elements of the thickets; bark of stem and main branches finely scaled and silvery-grey coloured, giving the plant a characteristic white appearance; where the lateral branches join the main axis they are usually supported by a slight buttress or elbow; twigs long and spineless, slightly pubescent when young and often pale brownish in colour, longitudinally ribbed. Leaves herbaceous, always trifoliate; leaflets broadly obovate and acute at the apex, crenate-serrate, sparsely clothed above and below with greyish hairs, especially when young, but these mostly falling off with age except along the peduncle and main nerves on the lower side of the leaflets; petiole often tinged with reddish-brown; middle leaflet of mature leaves often 6 cm. long and 4 cm. broad. Flowers appearing in December and January with the immature leaves, capitate; calyx and bracts clothed with buff indumentum; petals pale greenish-yellow when fresh and about as long as the calyx, clothed with fine silvery-buff hairs on the outer surface. Fruits ripening in July, sessile, pointed, about 1.3 cm. long, somewhat flattened, covered with a waxy bloom when fresh, becoming pink when ripe; seed with a small 4-lobed aril.

TANGANYIKA TERRITORY: Manyoni Distr.; Kisigo River, 1300 m., fls. 14.12.1932, B. D. Burt 3974 (type). Saranda, below the top escarpment of the Rift Valley, very common in *Acacia-Commiphora* thicket on "hard-pan" soils, 12.12.1932, B. D. Burt 3981, 3982, 3983 (fls. and young leaves); Kazikazi, in *Acacia pallens-Commiphora caerulea* thicket, fr. 26.7.32, B. D. Burt 1932, 1933. Kondoia Distr.; Sambala in *Commiphora-Acacia mellifera* thicket, rare, B. D. Burt 2090. Mpwapwa Distr.; between Nzuhe and Tubugwe, 24.4.1932, B. D. Burt 3964. Shinyanga Distr.; on Seke Road, fl. 4.1.1933, B. D. Burt 3978; Ngonko River, near Old Shinyanga, 3.4.1932, B. D. Burt 3989.

Commiphora sarandensis B. D. Burtt is closely allied to *Commiphora Holtziana* Engl. (Engl. Bot. Jahrb. 34, 310); but differs from this species in having acutely pointed instead of cuneate leaflets; moreover, the leaf of *C. Holtziana* is densely cinereopilose on both sides, and very much smaller than those of *C. sarandensis* (although the leaves of Engler's specimen are obviously immature). Engler describes his specimen as an "irregularly branched tree 4-5 m. high" while *C. sarandensis* is always of straggling habit.

C. sarandensis occurs usually inside "island-thickets," on "hard-pan" soils, composed of *Lannea humilis*, *Acacia mellifera*, *Commiphora Stuhlmannii*, *C. Schimperi*, *Combretum parvifolium*, and *Terminalia Stuhlmannii*. The plant is quite common where it occurs, but is not readily seen as it is masked by the other components of the thickets.

The sap of the branches and leaves of *C. sarandensis* is watery and scentless, but that of the young fruit is resinous and strongly apple-scented.

***Commiphora stolonifera* B. D. Burtt**, sp. nov. affinis *C. samhavensis* Schweinf. sed foliis majoribus differt.

Shrub 2-3.3 m. high, 7.5-12 cm. diameter at the base, much branched, soft-wooded and very spiny, with a rambling habit; branches bending over and rooting at the tips in the form of a stolon, from which vigorous young plants are produced and repeat the process; bark silvery-grey, peeling off annually; peel yellowish-brown, papery, semi-transparent, exposing dark-green, shiny young bark (sometimes brown-tinged); older branches silvery-grey, borne at right angles to the main axis arising from "buttressed elbows," young branches dark greenish-brown, glossy; lenticels few, small and corky; sap resinous, strongly pine-scented, comparable to Douglas-fir (*Pseudotsuga Douglasii*). Twigs sienna-red, 5-15 cm. long, spine-tipped, lateral spines occurring on main axis of twig; spineless twigs 0.6-1.2 cm. long bearing the leaves and inflorescence. Leaves always trifoliate, petiole $\pm$ 3.7 cm. long (specimens from Manyoni Distr. shortly and silvery tomentose, from Mpwapwa quite glabrous); leaflets obovate, acute, margin serrate or slightly crenate, central leaflet $\pm$ 3.7 cm. long $\pm$ 2.5 cm. broad. Inflorescence appearing in September before the leaves, consisting of a loose 3-branched cyme $\pm$ 3.7 cm. long; this and the calyx dark crimson, covered with viscid glandular hairs. Petals crimson, twice as long as calyx. Fruit ripening in February and March, epicarp turning pink when ripe, slipping off and exposing the seed, which is covered with a thin scarlet fleshy layer.

TANGANYIKA TERRITORY: Manyoni Distr.; near Ikonzi Stream on hard-pan soil 4,200 ft., 28.12.1931, B. D. Burtt 3460 (type; leaf specimen). Kisigo River, common on hard-pan soils among *Acacia mellifera* and *Commiphora subsessilifolia*, 14.12.1932, B. D.

Burtt 3973 (young fruits). Singida Distr.; East margin of Wembare Stnpe at Matelele, common on hard-pan soils, flowering 27.9.27, B. D. Burtt 729 (flowers). Mpwapwa Distr.; Gombo Valley between Gulwe, Nzuhe Lake and Kidite, 2,900 ft., common in *Commiphora Merkeri*, *Commiphora Hornbyi*, and *Cordyla africana* thicket, 17.4.1932, B. D. Burtt 3966. Near Matamondo 7.2.1933, B. D. Burtt 1936 (fruits).

Commiphora stolonifera B. D. Burtt resembles *C. samhavensis* Schweinf. from Eritrea (Engl. and Prantl., Pflanzenfam. 3, 4, 253 (1896) (nomen)), in the texture of the bark and shape of the leaf and fruit; the leaf, however, is very much smaller in *C. samhavensis*.

C. stolonifera is found chiefly in the Central Province of Tanganyika and along both sides of the Wembare Steppe. Plants have been seen between the Wembare and Nzega.

The plant is peculiar for its vegetative reproduction by stolons and should be useful in producing live fences for smaller game or cattle on "hard pan" soils, as it forms an intensely spiny and impenetrable thicket impervious to all larger game with the exception of elephant and rhinoceros.

***Commiphora Swynnertonii* B. D. Burtt**, sp. nov. foliis unifoliolatis sessilibus dense rufo-tomentosis distincta.

A very spiny, much-branched shrub, branching near the ground from a short stem 8-15 cm. in diam. and growing up to nearly 3 m. high; sap watery and slightly pear-scented; branches trailing, their tips reaching to the ground, but no stolons observed; spiny twigs arising radially from swollen "elbows" along the branches at about every 2.5-5 cm., giving a very spiny appearance; branchlets steel-grey and glossy, ending in a terminal spine, short subsidiary branchlets, which are spineless, bearing the leaves and flowers. Leaves sessile, unifoliolate, and shaped like those of *C. subsessilifolia* Engl., 1.3-4.5 cm. long when fresh, the margins finely serrate, the serration commencing about one-third of the way up the margin; surface clothed with dense rufous indumentum and felty on the midrib when young; the leaves borne in terminal rosettes or alternately along the very young shoots, these also clothed with rufous indumentum. Inflorescence sessile, but flowers not collected. Fruits sessile and pointed, ripening in April after leaf-fall, the epicarp becoming pink and falling off exposing the seeds which are covered with a thin yellow apricot-flavoured layer; aril almost absent and represented by a slightly thicker "fruity" coat along the keel and margins.

TANGANYIKA TERRITORY.—Manyari District at Mteve on the Kilimatindi Plains, growing locally in profusion among exposed duricrust rocks of a small escarpment, 16.12.1932, B. D. Burtt 3827 (type); same locality, seeds, 7.4.1933, B. D. Burtt 1935; leafless specimens were also seen gregariously in the Dodoma District, between Bahi and Dodoma in thickets near outcrops of granite in

Isobertlinia-Brachystegia wooding. Between Dodoma and Mpwapwa, and in South Massai Steppe between Handeni and Kibaya near Kisimacha Muungu, B. D. Burt.

Commiphora Swynnertonii B. D. Burt grows gregariously in desert conditions in thickets containing *Justicia salviflora*, *Dalbergia* sp., *Ochna Stuhlmannii*, *Salvadora persica*, *Commiphora stolonifera*, *Grewia villosa*, *Gardenia resiniflua* and *Euphorbia bilocularis*.

Note on *Commiphora subsessilifolia* Engl.

A remarkable trifoliolate form of *C. subsessilifolia* Engl. is commonly met with in shaded ravines or where this plant is over-shaded by some large tree. The trifoliolate form has been noticed in young and vigorous shoots appearing in the early rains, in the normal habitat. Burt 2088 from Sambala in the Kondo District shows the normal unifoliolate leaf of *C. subsessilifolia* and the trifoliolate leaf on the same twig.

Burt 3959 and 3993 show extreme forms collected at Kikombo in the Mpwapwa District.

In the former specimen the leaf reaches the unusual dimensions of 10 cm. long, while a petiole 1.3 cm. long is seen. The lateral leaflets are 2.5–4 cm. long. In no. 3993 the lateral leaflets are vestigial and only 0.3–1.3 cm. long.

Another remarkable feature of the trifoliolate form of *C. subsessilifolia* is the extremely acute apex of the leaflets. *C. salubris* Engl. from Kyimbila, Stolz 1683, 1769, of which only young leaf material is available, may prove to be the trifoliolate form.

The trifoliolate leaf of *C. subsessilifolia* Engl. resembles closely large leaves of *C. Schimperi* Engl.; however, the two species are readily distinguished in the field, as leaves of *C. subsessilifolia* are not resin-scented, while those of *C. Schimperi* are strongly resin-scented.

Excluded species.

C. subglauca Engl. Bot Jahrb. 48, 469 (1912), Holtz 1064, type from Zanzibar, 1903, is *Slerocarya caffra* Sond. The attenuated apex of the leaf of Holtz's specimen together with the venation and leaf-margin agree exactly with that species, while the fruit is too immature to be of descriptive value.

C. taborensis Engl. Bot Jahrb. 44, 153 (1909), is obviously *Lannea humilis* Oliv. Engler's description is based on leaf-material collected by Trotha jun. 78 from Tabora, and he quotes the native name "mtinje" which is the well-known Kinyamwezi and Kisukuma vernacular of *L. humilis*. Moreover, Engler has overlooked the stellate hairs which densely clothe the leaves of Trotha's specimen and are characteristic of *L. humilis*, but are not to be found in any known *Commiphora*.

C. tomentosa Engl. Bot. Jahrb. 34, 308 (1904), collected by Uhlig (no. 39 type) from the Buraberge in the neighbourhood of



C. Boiviniana Engl.
Typical tree in leaf season. Mpwapwa.



C. Boiviniana Engl.
Leaf and young fruit. Mpwapwa.



C. Boiviniana Engl.
Ripe fruit when leafless. Kikombo - Mpwapwa.

Mt. Kilimanjaro is also a *Lannea*, as the type specimen has the characteristic stellate hairs of *Lanneas* of the *L. humilis* group. Uhlig's specimen is trifoliolate and may be merely an unusual form of *L. humilis* Oliv.

C. Holstii Engl. Pflanzenw. Ostafrikas, 229 (1895) is a species of *Combretum* (*C. aculeatum* Vent.). The type specimen was collected by Holst 2408 at Kitivo in Massailand.

Acknowledgments are due to the Director of the Botanical Museum, Dahlem, Berlin, for permission to consult type specimens in 1928, to Dr. J. Hutchinson for much valuable help and criticism, and to Mr. A. W. Exell, of the Natural History Museum, who has made valuable outline drawings of Engler's type specimens. The photographs reproduced were all taken by the author.

X.—CONTRIBUTIONS TO THE FLORA OF TROPICAL AMERICA : XXIII.* N. Y. SANDWITH.

NOTABLE ADDITIONS TO THE FLORA OF BRITISH GUIANA.

The records and descriptions of new species in the present paper are compiled from the results of several recent collections in this Colony. The work of identifying the valuable material of Mr. T. A. W. Davis' expedition into the Rupununi district in 1931 has been continued. Prof. R. E. Fries has named all Mr. Davis' *Annonaceae*, with the exception of the *Guatterias*, and has described no less than seven new species (*Malmea discolor*, *Crematosperma guianense*, *Duguetia cauliflora*, *D. cuspidata*, *D. elegans*, *D. Sandwithii* and *D. macrocalyx*) in Acta Horti Bergiani, Band 12, no. 1 (1934). Besides these, *Anaxagorea multiflora* R. E. Fr., *Duguetia lucida* Urb. and *Fusaea longifolia* (Aubl.) Safford were collected for the first time in the Colony. Since then Mr. Davis has been collecting for the Forest Department in the neighbourhood of the Mazaruni Station and on the Lower Cuyuni River, and shows that it is still possible to discover new trees in the coastal rain forests. The flora of the Cuyuni River is, indeed, of extraordinary interest. Another trip to the Mahaicony River (near the coast, in Demerara County) was organized by the Forest Department in March 1934 and produced an interesting collection of savannah species.

Two large consignments of undetermined sheets from the Jenman Herbarium, Georgetown, have been dealt with during the last two years, and several first records were found amongst them. Assistance has also been given to Mr. T. G. Tutin in the identification of the very interesting collection of the Cambridge University Expedition to British Guiana in 1933, but the botanical results of this expedition are being published for the most part in "The Journal of Botany, British and Foreign." Finally, a small collection from the neighbourhood of Roraima, collected in November and December of 1931 by Mr. N. J. Abbensetts, was received through

* Continued from K.B. 1934, 368.

the Forest Department. This included many of the strange endemics of this region which are collected by all botanists who reach the summit of the mountain, but a few, notably *Hypericum roraimense* Gleason, *Palicourea obtusata* Krause and *Psychotria spicata* Benth. (non Müll. Arg.), are at present very rare in herbaria.

ANNONACEAE.

Xylopia frutescens Aubl.

Mazaruni Station, Sept., 1932, *Davis* in *Forest Dept.* no. 2322 : second-growth tree about 40 ft. high, on sandy hill slope in secondary forest about 14 years old ; flowers milk-white, scented.

Distr. Widely distributed in Continental Tropical America from British Honduras to Minas Geraes, Brazil.

POLYGALACEAE.

Securidaca orinocensis Rusby.

Devil's Hole Rapids, Cuyuni River, *Bartlett* in *Bot. Gard. Herb.* 8283 : climbing shrub with pink flowers.

Distr. Eastern Venezuela.

This species is characterised among its allies by the cordate base of the leaves, the simple racemes, and the unusually large flowers with sericeous-pubescent alae (compare *S. pubiflora* Benth.)

GUTTIFERAE.

Chrysochlamys Weberbaueri Engl.

Right bank of Rupununi River, a few miles above the mouth of the Maparri Creek, Sept., 1931, *Davis* in *Forest Dept.* no. 2162 : tree about 30 ft. high and 6 in. diam., with stilt roots, growing beside a small mountain stream on reddish sandy soil ; flowers cream ; fruit very pale green, marked with red like an apple.

Vernacular name, ? *Tapirero* (Wapisiana).

Distr. Amazonian Peru.

THEACEAE

Ternstroemia dentata (Aubl.) Sw.

Southern side of Kanaku Mountains, right bank of Rupununi River near Sand Creek, Oct., 1931, *Davis* in *Forest Dept.* no. 2245 : tree about 50-60 ft. high and 12 in. diam., on top of a hill in dry miscellaneous forest near savannah ; sepals creamy pink ; corolla white tipped with yellow.

Vernacular name, ? *Omiriv* (Wapisiana).

Distr. French Guiana, Amazonian Brazil.

RUTACEAE.

Galipea Davisii Sandwith, sp. nov.; juxta *G. trifoliatam* Aubl. atque *G. ciliatam* Taubert ponenda, ab ambabus calyce truncato brevissime denticulato extra dense vestito differt, praeterea a *G. trifoliata* indumento foliorum petiolorum inflorescentiaeque, a

G. ciliata inflorescentia rigida calyce multo majore corolla multo crassiore statim distinguitur.

Arbor mediocris, ramulis summis tenuiter sed conspicue striato-costatis satis dense furfuraceo-pubescentibus. *Folia* trifoliolata ; petiolus 1.7-5.5 cm. longus, inferne adpresse pubescens, superne dense patenter villosulus ; petioluli brevissimi, dense villosuli ; foliola elliptica, elliptico-ovata, vel oblanceolata, apice satis abrupte in acumen emarginatum 5-10 mm. longum attenuata, basi acute cuneata, 3.5-18.5 cm. longa, 1.4-7.5 cm. lata, terminale lateralibus longius, chartacea, marginibus regulariter ciliato-pilosis, praeterea supra costa dense (saltem inferne) nervis primariis sparse pilosis, subtus costa basin versus pilosa necnon axillis nervorum nonnunquam barbatis, ceterum glabra, utrinque intricate aequaliter reticulata et crebre punctata, nervis primariis lateralibus utrinsecus circiter 10 ascendentibus ac arcuato-anastomosantibus. *Inflorescentiae* axillares, foliis breviores, ubique pilosulo-vel furfuraceo-pubescentes, breviter corymboso-thyrsoideae ac ad 3.5 cm. latae, pedunculo nudo rigido 4-6 cm. longo, apice ramis paucis cymas trifloras gerentibus rigidis ascendentibus rectis dense pubescentibus inferioribus ad 1.3 cm. longis terminato. *Bracteae* lineari-subulatae, vix 2 mm. longae. *Flores* albi ; pedicelli brevissimi, crassi, sulcati, 1-2 mm. longi, indumento calycis vestiti. *Calyx* campanulatus, costatus, truncatus, minute denticulatus denticulis vix 0.2 mm. longis, circiter 4 mm. longus, vix 3.75 mm. latus, extra indumento duplici (et furfuraceo et pilosulo) dense griseo-tomentosus. *Corolla* ante expansionem subclavato-cylindrica, costata, extra siccitate arcte argenteo-sericea, circiter ad 2 cm. longa, sed alabastris junioribus saepius multo brevioribus, 2.5-3.2 mm. lata ; tubus 8-12 mm. longus, intus basi ipsa glabra excepta dense adpresse albo-villosulus ; lobi more generis imbricati, lineari-lanceolati, 7-9 mm. longi, 1.5 mm. lati (expansi haud visi, forsitan longiores latioresque). *Stamina* 2 fertilia antheris crassis linearibus 3-3.5 mm. longis, 0.8-1.1 mm. latis, appendice connectivi glabra 1-1.2 mm. longa atque 1 mm. lata, filamentis liberis haud visis. *Staminodia* 5, siccitate nigra, lineari-lanceolata, 1.75-2 mm. longa, apice glandula parva flavido-brunnea terminata. *Discus* basin ovarii cingens, cupularis, margine irregulariter sinuato atque denticulato, brunneus, glaber, 0.5-0.8 mm. altus. *Ovarium* 5-loculare, loculis 2-ovulatis, subglobosum, circiter 1.2 mm. longum et 1.3 mm. diametro, dense albo-villosum. *Stylus* 8-12 mm. longus, glaber sed glandulis parvis adpersus, apice subinteger. *Fructus* non visus.

BRITISH GUIANA. Essequibo River, left bank about 50 miles S.S.E. of confluence with Rupununi River, June, 1931, *Davis* in *Forest Dept.* no. 2056 (typus) : tree about 60 ft. high and 8 in. diam., in miscellaneous forest in which a thorny palm forms an understory, on brown sand on low-lying but not swampy land ; flowers white.

A very distinct species, not closely resembling either *G. ciliata* or *G. trifoliata*, yet clearly related to them, and especially to the latter.

The indumentum of the leaves is strikingly similar to that of *G. ciliata*. The floral measurements are taken from mature buds, since no fully expanded corolla was present on the material.

Fagara apiculata *Sandwith* sp. nov.; floribus subsessilibus, foliolis oblongis usque obovatis apice obtusis rotundatis vel truncatis brevissime apiculatis vel cuspidatulis insignis; ex affinitate **F. Krukovii** (*A. C. Smith*) *Sandwith* comb. nov.*, forma magnitudine foliolorum statim distinguenda; *F. acreana* Krause atque *F. juniperina* (Poepp.) Engl. floribus conspicue pedicellatis, *F. Weberbaueri* Krause acumine folioli longo optime differunt.

Arbor excelsa, ramulis spinis armatis etiam prope apicem crassis rugosis saltem 1 cm. diametro pubescentibus. *Folia* 25–40 cm. longa, petiolo 3.5–5.5 cm. longo atque rhachi teretibus tenuissime striatis satis dense minute pubescentibus; internodia rhacheos 3.7–7.5 cm. longa (summo nonnunquam breviora), nuda vel spinis paucis parvis vix ad 2 mm. longis armata; petioluli pubescentes, 2–8 mm. longi (ut videtur nonnunquam longiores); foliola 4–6-juga, opposita vel fere opposita, oblonga, obovato-oblonga, vel obovata, apice obtusa rotundata vel truncata et brevissime (vulgo 1–2 mm., raro ad 3.5 mm.) satis late cuspidatula vel apiculata, basi plus minusve (nonnunquam valde) inaequilateraliter cuneata, ima saepe tantum 3.5–5 cm. longa, 2–3 cm. lata, superiora 6.5–12 cm. longa, 3.7–5.8 cm. lata, coriacea, siccitate vulgo purpurascens, costa nervisque primariis utrinque minute puberulis ceterum glabrata, margine fere plano vel revoluta obscure vel satis conspicue praesertim dimidio superiore crenulato, subtus sub lente crebre punctulata, nervis primariis utrinsecus circiter 8–10 ascendentibus ac intricate anastomosantibus, rete venularum praesertim supra intricato utrinque elevato. *Inflorescentiae* axillares vel complures pseudoterminales, more generis late pyramidaliter thyrsoidae et valde floriferae, usque 26 cm. longae atque 18 cm. latae, ubique minute sed satis dense pubescentes, rhachi ramulisque angulatis; bractae ramos ramulosque subtendentes late breviter ovatae, 0.5–1 mm. longae. *Flores* viridi-albi, masculi tantum visi, complures in glomerulos aggregati, subsessiles (pedicello crasso brevissimo), bractea semiorbiculari bracteolisque binis ovatis circiter 0.5 mm. longis subtenti. *Sepala* 5 imbricata, late ovato-suborbicularia, rotundato-obtusa, ciliolata, circiter 0.5 mm. longa atque 0.75 mm. lata. *Petala* 5, ovato-elliptica, 1.5–2 mm. longa, 0.8–1 mm. lata. *Stamina* 5, filamentis 1.6–2 mm. longis; antherae 0.5 mm. longae. *Ovarii rudimentum* sulcatum, e carpidiis 3 approximatis stigmatibus sessilibus compositum.

BRITISH GUIANA. Supenaam River, in mixed forest at foot of brown sand slope, 1931, *Davis in Forest Dept.* no. 1053 (typus): tree 100 ft. high, flowers greenish-white. Apoteri, Rupununi River, June 1931, *Davis in Forest Dept.* no. 2064: tall tree about 120 ft.

*Syn: *Zanthoxylum Krukovii* A. C. Smith in Bull. Torr. Bot. Club, 60, 358 (1933)

high and 20 in. diam., in miscellaneous (*Swartzia*) forest; branches very thorny. Another collection apparently referable to this species is *Davis in Forest Dept.* no. 2157, Simuni Creek, Rupununi River, Aug. 1931: tree about 90 ft. high and 12 in. diam., on a very low gentle slope in Balata forest; flowers pale green; branches slightly thorny; leaves without thorns. This collection, which also bears male flowers only, has somewhat larger floral parts, the petals being 2.5 mm. long and 1.3 mm. wide, and the filaments 2.5 mm. long.

Vernacular name, *Sada* (Arawak).

OLACACEAE.

Minquartia guianensis Aubl.—*Secretania loranthacea* Müll. Arg.

Apoteri, Rupununi River, June 30th, 1931, *Davis in Forest Dept.* no. 2063: tree about 100 ft. high, 16 in. diam., with rather fluted bole with narrow window-like slits, growing on yellowish sandy clay soil in miscellaneous forest with Balata, on summit of a low hill; calyx rusty brown; corolla creamy-white. Demerara River, May, 1887, *Jenman* 3927; noted as "*Crucaballi*." This collection was found in the indeterminatae of the Kew *Sapotaceae*.

Distr. Panama to Guiana and Amazonian Brazil.

ICACINACEAE.

Poraresia anomala Gleason, ex descr.

Mazaruni Station, Oct. 26th, 1932, *Davis in Forest Dept.* no. 2327: tree about 60 ft. high and 6 in. diam., in miscellaneous forest; fl. white.

Distr. Amazonian Brazil.

This very peculiar genus was described by Dr. Gleason as recently as 1931 in Bull. Torr. Club, 58, 385. The type material was collected by the Tyler-Duida Expedition at Santa Isabel on the Rio Negro. The characters are unmistakable, and one is led to wonder if some author has not previously given the genus a less satisfactory position in some different family. No less than two old *Glaziou* collections at Kew, nos. 8306 and 9708, have been unearthed which are clearly referable to the same plant, but these numbers have not been traced in the *Olacaceae* of Glaziou's "Liste."

SAPINDACEAE.

Talisia furfuracea *Sandwith*, sp. nov.; *T. hexaphyllae* Vahl affinis, ramulis foliorum petiolo rhachi petiolulis foliolorum costa nervisque subtus necnon pagina dense furfuraceo-ferrugineo-puberulis, nervis foliolorum lateralibus numerosioribus, rete venularum minus intricato, inflorescentiis ex axillis foliorum in ramis junioribus exorientibus, ungue petalorum breviora differt; a *T. clathrata* Radlk. indumento supra commemorato, praeterea acumine foliolorum multo breviora neque caudato, nervis lateralibus magis horizontaliter patentibus, rete venularum utrinque intricatiora atque prominentiora venulis ultimis utrinque obviis (haud tantum tenuiter satis laxo clathrato) differt.

Arbor excelsa; ramuli summi juniores velut foliorum petiolus rhachis foliolorum petioluli costa nervique subtus necnon pagina (haec sparsius atque minutius) pube ferruginea furfuracea minuta densa saepe subtomentella sed facile deterili obtecti, subteretes, tenuiter sulcati et rimoso-striati. *Folia* paripinnata, usque 47 cm. longa, sed summa tantum usque 17 cm.; petiolus 7.5–11.5 cm. (folii summi 4.5 cm.) longus, subteres, crebre leviter sulcatus; internodia rhacheos 3.5–4.5 (foliorum summorum 1.8–2 cm.) longa, supra leviter anguste saepe obscure canaliculata; petioluli crassi, transverse corrugulati, 4.5–6.5 mm. longi, circiter 3 mm. lati (in folio summo 3–3.5 mm. longi, usque 2 mm. lati); foliola 3–4-juga, opposita, elliptico-oblonga, summa oblanceolato-oblonga vel oblanceolata, apice sensim vel satis abrupte acuminata, acumine basi lato vulgo 4–8 mm. longo sed in foliolis parvis multo brevior, basi obtusa vel subrotundata rarius in foliolis summis parvis acute cuneata, 10–17 cm. longa, 4.2–6 cm. lata, folii summi parvi 5.6–9 cm. longa, 2.4–3.3 cm. lata, coriacea marginibus revolutis, adulta etiam saepius subbullata, supra nitidula pallide olivaceo-viridia glabra nisi costa brunnea acuta prominula basin versus minute puberula, subtus costa nervisque valde prominentibus conspicue ferrugineis pagina siccitate flavescenti-viridi indumento supra descripto, nervis lateralibus primariis utrinsecus costam 16–18 supra planis angulo lato exorientibus patulis et prope marginem anastomosantibus, rete venularum intricato supra tenuiter laxo clathrato sed etiam venulis ultimis immerso-elevatis obviis subtus omnino prominulo. *Inflorescentiae* e thyrsis apicem ramulorum versus apud folia axillaribus fasciculatis compositae; thyrsi pyramidales, 10–20 cm. longi, ubique pallide fulvi, pubescentes et puberuli, rhachi angulata, ramis patulis vel ascendentibus; dichasia breviter pedunculata, prope basin velut pedicelli glandulis binis sessilibus praedita; pedicelli circiter 2 mm. longi, supra bracteolas articulati; bracteolae supra glandulas posita, subulatae, circiter 2 mm. longae. *Flores* albi, masculi tantum visi. *Calyx* ultra medium divisus; lobi ovato-elliptici, obtusi, 3.25–3.8 mm. longi, 2–2.25 mm. lati, extra pubescentes atque ciliati. *Petalorum* unguis ad 1.75 mm. longus, sursum sensim dilatatus, extra adpresse pilosus, intus glaber; lamina triangulari-ovato-lanceolata, 3 mm. longa, 1.8 mm. lata, glabra; squama laminam fere aequans, extra apice pilosulo excepto glabra, intus dense villosa. *Discus* crassus, cupularis, pentagonolobatus, circiter 1 mm. altus, vertice dense inferne sparsius pubescens. *Stamina* 8, glabra; filamenta inaequalia, 1.75–3 mm. longa; antherae ovato-oblongae, apiculatae, circiter 0.8 mm. longae.

BRITISH GUIANA. Mazaruni Station, March, 1934, *Davis* in *Forest Dept.* no. 2352 (typus): tree about 100 ft. high and 18 in. diam., slightly buttressed, with silvery-scaly bark and dense compact crown, a relict of former mixed forest in burnt forest on yellow sand; flowers white; calyx pale green.

Vernacular name, the black kind of *Moroballi* (Arawak).

The name *Moroballi* is also given to the very distinct *T. squarrosa* Radlk., which has only one pair of leaflets; a third British Guiana representative of the genus, *T. hemidasya* Radlk., again differs very widely from the present species on account of the densely fulvous-pilosulous inflorescence with an admixture of numerous gland-tipped hairs; while a fourth, *T. elephantipes* Sandwith, recently collected on the Cuyuni River by Mr. T. G. Tutin, has immense leaves with an extraordinarily swollen base to the petiole, many pairs of leaflets and a glabrous disk.

Matayba oligandra Sandwith, sp. nov.; species ob stamina constanter 4–6 (plerumque 5) valde insignis, foliolorum numero forma necnon venatione versus *M. oppositifoliam* (A. Rich.) Britton atque *M. peruvianam* Radlk. spectans, ab illa floribus petaliferis, ab hac magnitudine formaque foliorum foliolorumque statim distinguitur.

Arbor parva, vel si cl. Jenmano credite nonnunquam excelsa, ramulis summis hornotinis crebre lenticellatis pube tenuissima densa pallide fulva vel cinnamomea obtectis. *Folia* 20–40 cm. longa, ut videtur spurie imparipinnata ob rhachin apice ultra foliola terminalia productam, petiolo rhachique tenuibus 1–2 mm. tantum diametro teretibus satis dense pubescentibus pallide fulvis; petiolus 4.2–8.2 cm. longus; internodia rhacheos 2.5–4.5 cm. longa; petioluli pubescentes, supra canaliculati, 3–6 mm. longi; foliola 5–7-juga, alterna vel opposita, oblonga vel oblongo-lanceolata vel ima fere ovata, apice insigniter 0.5–1.5 cm. abrupte caudato-acuminata, basi inaequilateraliter cuneata, ima nonnunquam tantum 3.5 cm. longa et 1.5 cm. lata, cetera 5–10.5 cm. longa, 2–3.8 cm. lata, chartacea, integra, siccitate supra olivacea vel nigrescentia subtus saepe plumbea vel purpurascentia, supra costa nervisque principalibus minute sed satis dense pubescentia, subtus costa pubescente et pagina tota pilis parvis parvis regulariter adspersa, nervis lateralibus parallelis e costa numerosissimis, secundariis e primariis (his circiter 10–12) vix distinguendis, omnibus cum rete venularum intricato praesertim infra prominulis, costa ipsa supra prominula vel subimpressa subtus valde prominente. *Inflorescentiae* axillares vel pseudo-terminales, pyramidali-thyrsoideae, ubique pallide tenuiter fulvo-tomentellae vel dense pubescentes, ad 20 cm. longae, ramis gracilibus inferioribus 4–12 cm. longis, rhachi ramisque angulato-sulcatis, cymis breviter pedunculatis 1–3-floris; pedicelli 1–1.8 mm. longi (in cymis unifloris pedunculus cum pedicello 2–3.75 mm. longus); bracteae bracteolaeque minutae, ovatae vel oblongae, obtusae. *Flores* pentameri, siccitate 3–4 mm. diametro. *Calyx* forma generis propria. *Sepala* ovata, acuta vel apiculata, 1.2–1.3 mm. longa, 0.75–1.1 mm. lata, extra sparse puberula, conspicue ciliata. *Petala* obovata, saepe apiculata, unguiculata, 1.75–1.9 mm. longa, lamina 0.8–1 mm. lata extra glabra intus pilosa praeterea conspicue ciliata, apice unguis squamis binis liberis utrinque villosis obliquiter obovoideo-oblongis lamina ipsa brevioribus ac angustioribus in-

structa. *Stamina* vulgo 5, rarius 4 vel 6, filamentis 2.2–3 mm. longis vel in floribus superfemineis brevioribus, triente inferiore incrassatis villosis superne glabris; antherae glabrae, reniformes, vix 0.5 mm. attingentes. *Discus* glaber, tumide annularis, vix 1.5 mm. latus, umbilicato-excavatus. *Ovarium* stipite crasso glabro 1.2–1.4 mm. longo 0.6–0.85 mm. lato p̄xt florem lapsum mox elongato suffultum, ovoideum, trigonum vel subcompressum haud trigonum, 1.2–1.5 mm. longum atque latum, superne flavo-pubescent, trilobulare, loculis uniovulatis; stylus 1.75–2 mm. longus, apice subinteger, parce pubescens. *Ovarii rudimentum* in flore masculo simile sed omnibus partibus minoribus. *Fructus* non visus.

BRITISH GUIANA. Macouria Creek, near Bartica, Essequibo River, March, 1934, *Forest Dept.* no. 2354 (typus): a small tree or bush common in a low type of forest found near creeks. Opposite Bartica, April, 1887, *Jenman* 3637; noted as a "large tree." Demerara River, April, 1887, *Jenman* 3620; March, 1898, *Jenman* 7315.

This very interesting tree seems to have all the characters as well as the facies of a true *Matayba*, with the exception of its constant oligandry, a phenomenon which marks it as an anomalous and presumably retrogressive species. The fruit has not yet been collected.

Vernacular name (Arawak), *Kuleshiri*, "but not the *Kuleshiri* of high forests."

LEGUMINOSAE.

***Machaerium* (*Drepanocarpus*) *trifoliolatum* Ducke.**

Bartica, Nov., 1888, *Jenman* 4745, agreeing perfectly with *Ducke* 17188.

Distr. Amazonian Brazil (Pará).

***Dinizia excelsa* Ducke.**

Simuni Creek, Rupununi River, a few miles N. of the Kanaku Mountains, Aug., 8th, 1931, *Davis* in *Forest Dept.* no. 2119: a very large tree, 150 ft. high, 34 in. diam., with large wide-spreading crown, and moderately buttressed; bark rather scaly, brick-red when the scales have fallen; a common species in miscellaneous forest, showing a tendency to be gregarious.

Vernacular name, *Parakwa* (Wapisiana).

Distr. Amazonian Brazil (States of Amazonas and Pará).

This splendid tree was first described by Dr. Ducke in 1922 in Arch. Jard. Bot. Rio de Janeiro, 3, 76, t.4, and the floral structure and fruit were figured in 1930 in vol. 4 (t.11) of the same publication. The genus was placed in the *Mimoseae* next to *Stryphnodendron*, but its strongly imbricate petals would suggest its closer affinity with the *Caesalpinieae* amongst the genera on the border of the two tribes. Dr. Ducke, however, whose knowledge of the Amazonian flora has never been equalled, writes reaffirming his confidence in the relationship of *Dinizia* with *Stryphnodendron*, *Piptadenia* and *Pentaclethra*

in the *Mimoseae*. This is one of the largest trees of "hylaea" and is known in Brazil by the names "Angelim" and "Faveira." Dr. Ducke records it from siliceous-clayey or clayey soils in the highest virgin forests of the Rios Mojú, Xingú, Tapajos and Trombetas, and from the islands of Breves, in the state of Pará; and from Maués and Manáos in the state of Amazonas.

ROSACEAE.

***Moquilea riparia* Gleason.**

Southern slopes of the Kanaku Mountains, near the right bank of the Rupununi River, c. 1400 ft., Oct. 29th, 1931, *Davis* in *Forest Dept.* no. 2250: tree about 100 ft. high and 18 in. diam., on a steep mountain slope in miscellaneous forest; flowers cream, with the centre and the ovary creamy-pink. Compared with *Krukoff* (coll. Froes) 1961.

Distr. Amazonian Brazil.

***Licania grisea* Kleinh., ex descr.**

François Creek, Mahaicony River, March 23rd, 1934, *Davis* in *Forest Dept.* no. 2365: tree about 90 ft. high and 16 in. diam., in mixed forest on brown sand; bole smooth, grey, tending to be fluted at the base; flowers cream.

Vernacular names, "Iron Mary," *Unikiakia* (Arawak), large kind.

Distr. Surinam.

***Hirtella Davisii* Sandwith, sp. nov.**; staminibus 3, forma foliorum inflorescentiaeque *H. triandrae* Sw. certe affinis, sed bracteolis rotundatis glandulis multis breviter stipitatis marginatis primo visu distinguitur; *H. ciliata* Mart. et Zucc., quae bracteolis satis similibus gaudet, forma foliorum staminibus 6 valde discrepat; *H. Ulei* Pilger forma inflorescentiae necnon bracteolarum, staminibus pluribus differt.

Arbor parva, ramulis summis (annotinis tantum visis) cinereis crebre lenticellatis, glabris vel apice parce pilosis. *Stipulae* anguste subulatae, circiter 3.5 mm. longae. *Folia* lanceolata vel oblongo-lanceolata, apice sensim acuminata, basin versus attenuata sed basi ipsa rotundata, nonnunquam levissime cordata, rarius cuneata, 7.7–13 cm. longa, 2.3–4 cm. lata, tenuiter coriacea, utrinque satis nitida costa nervisque brunnescentibus, supra glabra asperula, subtus glabra vel nervis parcissime pilosula sed basibus tuberculatis (cf. *H. triandram*) pilorum caducorum crebre adspersa, nervis primariis utrinsecus circiter 10 ascendentibus ac arcuato-anastomosantibus, his cum costa supra prominulis subtus prominentibus, rete venularum supra intricatissimo prominulo (minus quam in *H. Ulei*, magis quam in *H. triandra*) subtus impresso; petiolus 3–4 mm. longus, pilosus vel glaber. *Inflorescentiae* axillares, 4–13 cm. longae, vix ad 3 cm. latae, paniculatae, ubique pilis stramineis satis dense breviter pilosae; bractae anguste triangulari-lanceo-

latae, 2-3 mm. longae, basi 1 mm. vel paulo ultra latae, basi tantum marginibus glandulis paucis sessilibus vel subsessilibus instructae; bracteolae late ovato-semicirculares, circiter 1-1.5 mm. latae, sparse pilosae, margine glandulis multis breviter stipitatis vel nunquam subsessilibus fimbriatae, praeterea et pagina glandulis sessilibus hic illic instructae; pedicelli supra bracteolas summas 2.5-5 mm. longi. *Calycis* tubus circiter 2 mm. longus, siccitate nigrescens atque vulgo satis sparse pilosus; lobi ovati vel ovato-suborbiculares, apice rotundati, mox reflexi, extra sparse pilosi et puberuli, intus dense griseo-pulverulento-puberuli. *Petala* alba, ovata vel suborbicularia, apice rotundata, 3-4 mm. longa, 2.5 mm. lata. *Stamina* 3, glabra, filamentis 1.1-1.3 cm. longis. *Ovarii* vertex dense villosus; stylus basin versus sparse pilosus, 1-1.4 cm. longus. *Fructus* desideratur.

BRITISH GUIANA. Near Oko Creek, Cuyuni River, March 1933, Davis in *Forest Dept.* no. 2345 typus: a small tree about 40 feet high and 4 in. diam., in mora forest; flowers white; calyx, upper half of filaments and style purplish-mauve.

The facies of the bracteoles and of the whole inflorescence of this tree is very similar to that of *H. ciliata* (including *H. rubra* Benth.), but the most nearly related species is almost certainly *H. triandra*.

LECYTHIDACEAE.

Eschweilera holcogyne Sandwith, sp. nov.; floribus subsessilibus, calycis tubo in articulo sessili valde incrassato et ob sulcos de sinibus sepalorum descendentes conspicue 6-lobato notabilis; ab *E. simiorum* (Ben.) Eyma ac *E. congestiflora* (Ben.) Eyma foliis parvis sepalis minoribus forma galeae androecii, ab *E. Wachenheimii* (Ben.) Sandwith forma foliorum sepalis petalisque multo majoribus petalis externis haud puberulis, ab *E. chartacea* (Berg) Eyma nervis primariis lateralibus paucioribus sepalis petalisque multo majoribus, ab *E. valida* (Miers) Ndz. (? *Lecythis elliptica* H. B. K.) forma foliorum nervis lateralibus paucioribus inflorescentia multo minore sepalis majoribus facile distinguenda; *E. ovalifolia* (DC.) Ndz. characteribus foliorum omnino discrepat.

Arbor excelsa, c. 30 m. alta; ramuli summi tenuiter crebre striati sulcatique, lenticellati. *Folia* oblonga, elliptica vel elliptico-oblongata, apice sensim ad 1 cm. vulgo acute acuminata, basi cuneata vel obtusa fere rotundata et abrupte in petiolum decurrentia, 6.5-13 cm. longa, 2.4-6.8 cm. lata, subintegra sed obscure late sinuato-crenata, glabra, firme chartacea vel subcoriacea, siccitate vulgo utrinque olivascenti-plumbea vel brunnescentia, utrinque nitidula, costa utrinque praesertim subtus prominente, nervis primariis lateralibus utrinsecus 7-10 (vulgo circiter 8) arcuato-ascendentibus et longe a margine anastomosantibus supra fere planis subtus prominentibus, rete venularum intricato supra subtili sed manifesto fere plano subtus prominulo valde obvio; petiolum alatus, supra canaliculatus, 5-10 mm. longus. *Inflorescentiae* axillares (? et terminales), simplices vel basi ramosae, congestiflorae,

breves, 1.5-3.2 cm. longae (an nonnunquam longiores?), post florum lapsum articulis pedicellorum brevissimorum valde cicatricosae necnon corrugulatae, glabratae. *Bracteae* bracteolaeque non visae. *Flores* in articulo sessiles. *Alabastra* aperientia ad 2.2 cm. diametro. *Calycis* tubus circiter 1 cm. (siccitate 7-8 mm.) latus, 2-4 mm. altus, crassus, cupularis, conspicue anguste longitudinaliter sulcatus atque 6-lobatus, ceterum laevis, glaber; sepala oblonga vel oblongo-ovata, apice rotundata, 6.5-10 mm. longa, 5-7 mm. lata, basi imbricata, glabra vel dimidio superiore minute ciliolata. *Petala* alba, oblonga, superne ciliolata, ceterum glabra, 2.3-3.3 cm. longa, 1.4-1.8 cm. lata. *Androecii* stamina in annulo circa ovarium numerosissima, filamentis sub antheris clavato-dilatatis, latere galeae longiora et ad 6 mm. longa; galea supra ovarium inflexa sed haud spiraliter incurvata, superne parte inflexa valde incrassata, intus appendicibus sterilibus deorsum (basin versus) directis oblecta. *Ovarium* semiinferum, 4-5-loculare, loculis pluriovulatis, vertice late subconico leviter plurisulcato vix 7 mm. diametro; stylus ad 3.5 mm. longus. *Fructus* haud visus.

BRITISH GUIANA. Kartabo Road, near confluence of Cuyuni and Mazaruni Rivers, Feb., 1931, Davis in *Forest Dept.* no. 1019 (typus): tree about 100 ft. high, 14 in. diam., on brown sandy loam on hill slope in mixed forest; flowers white, staminal column pale yellow, strongly scented. Near Kurupukari, Essequibo River, July, 1920, Hohenkerk in *Forest Dept.* no. 842.

Vernacular name, *Howdan* (Arawak).

The measurements of the floral parts are taken from the excellent spirit material of the type collection which was preserved by Mr. Davis. The specific epithet refers to the conspicuously furrowed calyx tube. The androecium hood appears to be of the same type as that of *E. amara* (Aubl.) Ndz., see Eyma, Polygonaceae, Guttiferae and Lecythidaceae of Surinam, pp. 184, 196, fig. 9 (1932).

Eschweilera praeclara Sandwith, sp. nov.; floribus subsessilibus, calycis tubo crasso lato in articulo semper sessili, ceterum *E. chartaceae* (Berg.) Eyma affinis sed forma foliorum, rhachi inflorescentiae rigida crassa conspicue striata atque verruculosa, sepalis suborbicularibus differt; ab *E. valida* (Miers) Ndz. nervis foliorum paucioribus, inflorescentia minus valida striata atque verruculosa, floribus minoribus recedit; ab *E. Wachenheimii* (Ben.) Sandwith foliis subtus haud glaucescentibus multo minus prominenter reticulatis, sepalis petalisque majoribus, petalis exterioribus haud extra griseo-puberulis, ovario quadriloculari valde distincta; ab *E. ovalifolia* (DC.) Ndz. foliis parvis, sepalis magnis statim distinguitur.

Arbor excelsa vel satis parva; ramuli summi conspicue striati sulcatique, lenticellati. *Folia* elliptica, oblonga, obovato-oblonga vel oblanceolata, apice acute acuminata vel cuspidata, basi longe acute vel abrupte cuneata et in petiolum decurrentia, 8-14.5 cm.

longa, 3.3–6.3 cm. lata, subintegra, glabra, costa subtus minutissime puberula excepta, plus minusve coriacea marginibus leviter revolutis, siccitate supra viridia vel olivaceo-nigrescentia subtus pallide viridi-brunnea vel viridi-plumbea, utrinque saepius plus minusve nitidula, costa supra prominula subtus valde prominente, nervis lateralibus primariis utrinsecus vulgo circiter 12 ascendentibus et satis longe a margine anastomosantibus supra fere planis subtus prominulis, rete venularum laxo intricato supra fere plano vel subimpresso manifesto sed haud obvio subtus tenuissime manifeste prominulo; petiolus alatus, supra canaliculatus, minutissime puberulus, 5–8 mm. longus. *Inflorescentiae* axillares et terminales, racemis apice ramulorum paniculatis, singulis ad 13 cm. longis (saepo multo brevioribus), rhachi crassa saepius flexuosa congestiflora dense puberula loriciformi corrugulato-sulcata necnon crebre verruculoso-lenticellata praeterea post florum lapsum articulis pedicellorum brevissimorum crassis valde cicatricosa. *Bracteolae* ovato-suborbiculares, puberulae, 1.5–2 mm. longae atque latae, cito caducae. *Flores* in articulo sessiles. *Alabastra* aperiencia siccitate 7–8 mm. diametro. *Calycis* tubus 4–5 mm. latus, 1.5–2 mm. altus, crassus, cupularis, infra sinus sepalorum plus minusve late excavatus sed haud regulariter longitudinaliter sulcato-lobatus, dense minute puberulus, levissime corrugulatus et verruculosus; sepala suborbiculari-ovata, extra minute puberula et ciliolata, inaequalia, basi imbricata, 3–4 mm. longa atque lata. *Petala* lactea vel cremea atque roseo-suffusa, obovato-oblonga, sparse ciliolata, ceterum glabra, inaequalia, 1.1–2 cm. longa, 0.7–1.3 cm. lata. *Androecei* stamina in annulo circa ovarium numerosissima, filamentis sub antheris leviter dilatatis, longiora circiter 4.5 mm. longa; galea pallide flava, supra ovarium inflexa sed haud spiraliter incurva, parte inflexa incrassata appendicibus sterilibus margine apicali porrectis intus deorsum (basin versus) directis oblecta (raro haud incrassata appendicibus plane nullis). *Ovarium* subinferum, 4-loculare, loculis pauciovulatis (ovulis in quoque loculo haud usque 10), vertice primum plano vel fere depresso striato-sulcato mox supra fructum maturescentem elevato-subconico; stylus circiter 2 mm. longus. *Fructus* maturus haud visus, juvenis parte infra zonam sepaliferam crebre brunneo-lenticellata sublaevi vertice late conico nigrescente.

BRITISH GUIANA. Northern side of the Kanaku Mountains, about 10 miles east of the Takatu River, 450–800 ft., Sept.–Oct., 1931, *Davis* in *Forest Dept.* nos. 2190 and 2199 (typus). No. 2199 was a large tree 100 ft. high and 18 in. diam. on a steep rocky mountain slope in miscellaneous forest; flowers cream with a faint pink blush, staminal plate pale yellow. No. 2190 was a small tree 42 ft. high and 6 in. diam. in miscellaneous forest (with *Kokerite*, *Maximiliana* sp.) fringing the foot of the mountains; flowers milk-white, staminal plate pale yellow, calyx green.

Vernacular name, *Howdan* (Arawak); this name is also given to the very distinct *E. holcogyne*.

E. Schomburgkii (Berg) Ndz.—*Chytroma Schomburgkii* Miers.

Lower part of Simuni Creek, Rupununi River, Aug., 1931, *Davis* in *Forest Dept.* no. 2159: a small tree about 20 ft. high and 3 in. diam., in low fringing forest near the bank of the creek, with savannah behind; flowers white, staminal plate tipped with yellow.

Distr. Endemic. Robert Schomburgk first discovered it in August by the skirts of savannahs and, from the evidence of the Kew Herbarium, the species has not been re-collected since his later expeditions with his brother.

Couratari fagifolia (Miq.) Eyma—*Lecythis fagifolia* Miq. ap. Berg. *Allantoma fagifolia* (Miq.) Miers.

Southern side of Kanaku Mountains, on right bank of Rupununi River near Sand Creek, c. 1,200 ft., Oct., 1931, *Davis* in *Forest Dept.* no. 2242: a large tree 120–130 ft. high and 24 in. diam. with buttresses to 10 ft. or higher, in miscellaneous forest on a steep slope; branches with flowers leafless; flowers pale pink, calyx deep red.

Vernacular name, *Wadara* (Arawak). Another *Wadara*, *C. pulchra* Sandwith, was found growing at a lower elevation near the Simuni Creek (no. 2147).

Distr. Guiana.

MELASTOMATACEAE.

Mouriri Sideroxylon Sagot ex Triana.

François Creek, Mahaicony River, March, 1934, *Davis* in *Forest Dept.* no. 2364: tree about 75 ft. high and 8 in. diam., unbuttressed, in mixed forest on brown sand soil; buds purplish-mauve; petals pale pink; stamens white, deep purple at apex; anthers purple; style white.

Vernacular name, *Mamuriballi* (Arawak.)

Distr. French Guiana.

This material differs from the only collection seen and recorded, *Sagot* 914, in the thicker leaves, in the bracteoles being placed higher on the pedicel (often near or even above the middle), and in the calyx being more distinctly divided into minutely ciliate lobes. Further collections from Guiana are necessary before the possible variability of *M. Sideroxylon* can be estimated.

SAPOTACEAE.

Lucuma speciosa Ducke.

Mazaruni Station, Aug., 1932, *Davis* in *Forest Dept.* no. 2307: tree about 110 ft. high, 28 in. diam., in miscellaneous forest on hill slope, apparently very rare; lower surface of leaves, calyx and fruit densely covered with rusty reddish tomentum; flowers pale green. *Ibid.*, June, 1933, *Tutin* 176. Bamboo Creek, right bank of Rewa River, Rupununi District, July, 1931, *Davis* in *Forest Dept.* no. 2086: tree about 120 ft. high and 28 in. diam., common in miscellaneous forest with *Mora*, on sandy hill slope.

Distr. Amazonian Brazil (Rio Trombetas and Rio Branco de Obidos).

L. dissepala (Krause) Ducke.—*L. Duckei* Huber. *Vitellaria dissepala* Krause.

Kanaku Mountains, on southern side near Rupununi River, c. 1000 ft., Oct., 1931, *Davis in Forest Dept.* no. 2244: tree about 80 ft. high, 8 in. diam., in miscellaneous forest on hill slope; flowers pale green. Kanaku Mountains, near Nappi Creek, a tributary of the Pirara River, c. 400 ft., Oct., 1931, *Davis in Forest Dept.* no. 2219: tree about 80 ft. high, 10 in. diam., on level ground at foot of mountains in miscellaneous and Kokerite Palm forest.

Distr. Amazonian Brazil.

L. sericea Krause.

Simuni Creek, Rupununi River, a few miles N. of the Kanaku Mts., Aug., 1931, *Davis in Forest Dept.* no. 2115: tree about 80 ft. high and 12 in. diam., near the top of a low hill in miscellaneous forest; fl. pale green, calyx brown, lower surface of leaves reddish-brown.

Vernacular name, *Bakupar* (Wapisiana).

Distr. Brazil (Rio Branco).

Davis writes that this species is very abundant, especially in forests near the savannah, or in "islands" of forest in it. It coppices freely, and is common in second growth.

POLYGONACEAE.

Coccoloba mollis Casaretto.—*C. polystachya* Wedd., cum vars.

Berbice River, June, 1889, *Jenman* 5187 (coll. Mr. Bridges).

Distr. Surinam, Brazil.

LAURACEAE.

Ocotea tomentella *Sandwith*, sp. nov.; fortasse juxta *O. caracasana* (Nees) Mez ponenda, sed floris masculi filamentis staminum serierum exteriorum antheras superantibus, perianthii lobis obtusis rotundatis, staminodiis nullis differt.

Arbor excelsa, 30–45 m. alta; ramuli hornotini dense arcte cinnamomeo-tomentelli, crebre verruculoso-rugulosi, superne conspicue acutanguli sulcati, 6–8 mm. diametro. *Folia* petiolis supra canaliculatis, subtus convexis rugulosis, inferne circiter 1.5–1.8 cm. longis tum longe (ad 2.5 cm.) dilatato-alatis ac in laminam trans-euntibus, ubique pallide arcte tomentellis; lamina elliptica, elliptico-oblonga vel rarius obovato-elliptica, apice breviter (0.4–1 cm.) cuspidata, basi cuneata et ut supra commemoravimus in petiolum abrupte longe attenuata marginibus insigniter revolutis, 11–26 cm. longa, 5.3–10.7 cm. lata, tenuiter coriacea, supra nitida basi tomentella excepta glabra, subtus opaca ubique pallide arcte minute ochraceo-vel griseo-tomentella, costa supra plus minusve impressa subtus prominente utrinque praesertim basin versus supra verruculoso-granulata, nervis lateralibus utrinsecus vulgo 11–14 supra fere impressis subtus prominentibus arcuato-ascendentibus ac anastomosantibus, rete venularum utrinque intricato prominulo

conspicuo, areolis supra haud prominulo-granulatis sed obscure impresso-punctatis. *Inflorescentiae paniculae* corymbum amplissimum pseudoterminali 14–25 cm. latum efformantes, anguste pyramidales, inferiores ad 19 cm. longae, ubique dense arcte minute pallide griseo-tomentellae, rhachi acutangula, ramis compressis apice 1–3-trichotomo-divisis igitur multifloris sed pedunculis cymarum cymularumque semper manifestis. *Flores* dioici, ♂ tantum visi, 5–6 mm. lati, pedicellis brevissimis, tubo manifesto subcampanulato sulcato-angulato 1.5 mm. longo apice circiter 2 mm. lato; lobi aequales, late ovato-suborbiculares vel suborbiculares, 3 mm. longi, 2.7 mm. lati, apice obtusi rotundati, extra tomentelli, intus minute pubescentes. *Staminum* series 2 exteriores filamentis antheras superantibus compresso-applanatis extra sparse pubescenti-pilosulis 1–1.2 mm. longis vix 0.5 mm. latis, antheris ovato-subrectangularibus 0.8–1 mm. longis basi 0.8 mm. latis apice truncato-obtusis atque vulgo obscure emarginatis; series tertia filamentis angulatis vel sulcatis glabris 1.3 mm. longis, antheris anguste oblongo-rectangularibus apice emarginatis circiter 1 mm. longis atque 0.6 mm. latis, loculis inferioribus extrorse superioribus lateraliter dehiscentibus, basi glandulis globosis sessilibus undulato-costatis ac excavatis 0.5–0.6 mm. diametro praedita; staminodia nulla. *Pistillum abortivum* glabrum, ovario anguste obovoideo-fusiformi ad 1.2 mm. longo 0.3–0.4 mm. lato, stylo cum stigmate 2.5 mm. longo. *Bacca* ellipsoidea, matura ad 2 cm. longa, ad 1.2 cm. lata, basi cupulae insidens; cupula hemisphaerica, 8–10 mm. alta, vulgo 1.2–1.3 cm. diametro, margine integro simplici, extra crebre rugulosa glabrescens, basi in pedicellum incrassatum 4–5 mm. longum attenuata.

BRITISH GUIANA. Arawak Matope, Cuyuni River, fl. July 17th, 1933, *Tutin* 375 (typus floris masculi in Herb. Mus. Brit., dupl. in Herb. Kew.): tree 120 ft. high, 37 in. diam., in mixed forest; has small buttresses extending 15 ft. up the trunk; leaves dark green and shining above, pale beneath, flowers white. Upper Camaria, Cuyuni River, fr. Feb. 14th, 1931, *Lockie in Forest Dept.* 2035 (typus fructus in Herb. Kew.): large tree, 130 ft. high, 20 in. diam., on sandy flat near creek. Tinamou Falls, Cuyuni River, fl. March 6th, 1931, *Davis in Forest Dept.* 1039 (Herb. Kew.): a very large tree, about 140 ft. high, buttressed, on low hill in swamp, on brown sand, in mixed forest.

Vernacular name, *Baradan* (Arawak).

A very large forest tree, at present collected only from a limited area of rain forest on the Lower Cuyuni River. The species does not run down to anything resembling it in Mez's admittedly artificial key to the genus, nor has any close affinity been found in the Kew Herbarium. It does not agree with any of the numerous species which have been described since the publication of Mez's monograph. A probable relationship may be suggested with such species as *O. opifera* Mart., *O. Kunthiana* (Nees) Mez, *O. glomerata* (Nees) Mez, and *O. caracasana* (Nees) Mez. The first three of these differ widely

and can be distinguished at a glance from *O. tomentella*. *O. caracasana* is not represented in London; it has the tomentellous lower surface of the leaf, but evidently differs specifically owing to its short outer filaments, its acute perianth lobes, and the presence in the male flowers of a conspicuous whorl of stipitiform staminodes. A peculiar and striking characteristic of all the collections of the present species is the abruptly and narrowly long-attenuate and strongly revolute base of the lamina which merges insensibly into the petiole.

XI.—FRAXINUS PALLISAE AND ITS RELATIONSHIPS. H. G. TEDD AND W. B. TURRILL.

The genus *Fraxinus* was monographed in "Das Pflanzenreich" by A. Lingelsheim, the part containing this genus being published in 1920. No mention has been found in this work of the interesting ash described (1) by A. J. Wilmott in 1916 from the Danube Delta as *F. Pallisae*. The type material (no definite type number or sheet is quoted) came from Letei, Dobruja (Dobrogea) and the varieties β . *gyrocarpus* and γ . *angustifolius* (varietas vel status), from Caraorman, Dobruja (Dobrogea). By Mr. Wilmott's courtesy the original material has been examined and compared with the more recently collected specimens discussed below. The var. *gyrocarpus* (flat) fruits are now known to occur on the same tree. The var. (vel. status) *angustifolius* was apparently named from the narrow leaflets (not as the name would suggest from its having narrow leaves) and represents one of a large number of variations in leaflet shape, which are usually to be found in populations of *F. Pallisae*.

Apart from its occurrences in the Danube Delta, *F. Pallisae* has been recorded from eastern Bulgaria, both north and south of the Stara Planina ("the Balkans" of some English maps). It occurs in the Longos forest which occupies the valley of the river Kamtschija (Kamčija) whence it was recorded and figured by Mattfeld (2). Stojanoff, in a very clear account of the vegetation of this area (3 and 4), records the plant as occurring in an association dominated by *Alnus glutinosa* Gaertn. (33.3 per cent.) but found (an average of five surveys) it represented only 0.5 per cent. of the trees and tall shrubs. It may be noted that *Fraxinus oxyphylla* M. Bieb. had a percentage occurrence of 4.7 in the same community. Stojanoff notes that ecologically and floristically nearly similar woods (though, so far as was then known, without *F. Pallisae*) occur in eastern Macedonia and in western Thrace. He states that they all occur, except those in the Strandja district, in damp to marshy ground under continental climatic conditions. The word Longos is used by Bulgarian foresters to designate stream- or river-woodland with numerous woody lianes and is defined botanically as "einen an Holzlianen reichen, gemischten Auwald, der auf nassen Boden und bei ziemlich kontinentalen klimatischen Ver-

hältnissen im Osten der Balkanhalbinsel vorkommt." Mattfeld (5, p. 18 footnote) has some interesting remarks on the history of the word in the Slav languages. Stojanoff says that these river-side woodlands must represent an ancient type and have been formerly much more widely distributed in Bulgaria, Thrace, and Macedonia than they are now.

In the Strandja (Strandza) area in south-eastern Bulgaria, the portion on the Turkish side of the border has not been explored botanically. *F. Pallisae* is given by Stefanoff as a constituent of the river-shore woodlands on the Bulgarian side of the boundary, along with *F. oxyphylla* and many other woody plants (6, p. 32). These woods also occur on damp soil (they are said by Stefanoff to be "edaphic formations") and to have as characteristics quick and varied development of the tree flora, presence of a large number of climbing plants (including such woody ones as *Periploca*, *Smilax*, and *Vitis*) and poor development of the grassy undergrowth. Mattfeld (5 p. 19) also describes the vegetation of the valleys in south-eastern Bulgaria and in plate IV of his paper a photograph is reproduced showing a longos wood in the Tschilingos dere with *Alnus glutinosa*, *Fraxinus oxyphylla* (*F. oxycarpa*), *F. Pallisae*, *Populus tremula*, *Prunus divaricata*, *Pirus malus pumila*, *Vitis silvestris*, *Smilax excelsa*, *Clematis vitalba*, and *Pteridium aquilinum*. The forest vegetation of the Strandja, consisting, in addition to the longos woods, of subxerophilous communities and mesophilous forest with *Fagus orientalis* and a mixture of other Pontic trees and shrubs, is very rich floristically but does not further concern us here (see 1, p. 139).

A preliminary note has been published (7) recording the occurrence of *Fraxinus Pallisae* in western Thrace, in the delta of the River Mesta. The importance of this discovery becomes evident in the discussion which follows.

In addition to the material quoted by Wilmott, which is in the British Museum (Natural History) herbarium, the following specimens (all at Kew) have been examined:

Bulgaria: Istrandja (or Strandja) Dagħ, *Stoyanoff and Stefanoff* 906. Also fruits received in 1932.

Dobruja: distr. Tulcea. In silvis mixtis in dunis maritimis arenosis ad Letea in Delta Danubii, alt. cca. 1-5 m., 14 Jul., 1923 *A. Borza*, Fl. Rom. exsicc. 760.

W. Thrace: Boyadjiler, 25.5.1934, two sheets of miscellaneous collection of leaves, *Tedd* s.n. Boyadjiler, 16.10.1933, leaves and shoots showing fungus attack on ash leaves, very common in some localities and apparently causing premature leaf fall and possible damage to the trees. The fungus has been identified by Dr. Buisman as *Phyllactinea corylea* (Pers.) Karst.

Bekki Ovasi, copse, relict of delta forest of R. Mesta, 8.7.1933, No. 1096. From a tree about 30 feet high.

Bekki Ovasi, edge of copse, wettish land (but now very dry), specimens gathered 20.2.1934 and flowered in water 28.2.1934, No. 1320. Tree about 30 feet high. Leaves collected 12.6.1934.

Bekki Ovasi, edge of copse, 12.3.1934, No. 1321. Young tree, about 15 feet high. Leaves collected June, 1934.

Bekki Ovasi, grassland near copse, in remains of hedge, 12.3.1934, No. 1322. Leaves collected 12.6.1934. The infructescences are much galled (probably following insect attack) and little fruit was produced. That which was collected is well formed and ranges from flat to much twisted (i.e. type and var. *gyrocarpus* fruits occurred on the same tree).

Karakeuy, hedge of trees, or windbreak around swampy grass field, 30 m., 9.3.1934, No. 1323. Young tree, about 25 ft. high. Leaves collected 12.6.1934.

Karakeuy, 30 m., 9.3.1934, No. 1324. Young tree, about 25 feet high. Leaves collected June, 1934.

FIELD NOTES ON *FRAXINUS PALLISAE* WILMOTT, AS
OCCURRING IN W. THRACE.

Fraxinus Pallisae Wilmott first came under observation in W. Thrace as a constituent of a small copse near the village of Bekki Ovasi in the S.W. part of the Xanthie district. The village lies on a flat sandy plain, and is about 5 miles E. of the River Mesta (Nestos or Kara-Sou) and some 8 miles from its mouth. Search has subsequently shown the species to occur in other localities near Xanthie, and such localities may be classed under three fairly distinct types:

- (1) "Forest relicts" in the lower Mesta region, and in the forest fringing the lower reaches of the river, i.e. after its debouchment from the mountain gap.
- (2) Small woods of elm and oak, often near water, usually sluggish streams.
- (3) Open woods (park type) of elm and oak, near streams and wet places.

All of the above localities have in common a wettish and usually sandy soil, with a fair amount of clay and humus. The species has not so far been observed in the mountain or hill districts, though search has been made, and seems to be confined to the flat shelf between the Rodope Mountains and the Aegean Sea.

This ash is seldom seen growing in isolated positions; on the other hand it seeds freely, and ash seedlings are fairly numerous on the humus floor of the copse in which it is most frequent, so it is possible that grazing by cattle and goats is the factor which decides the gregarious habit. When cut down the tree suckers freely, the leaves of the suckers being usually larger, and with more leaflets than on the straight-grown tree.

To consider the above habitats in some detail—

1. (a)—The forest fringing the R. Mesta is principally composed of species of poplar (*P. canescens* Sm., with *P. nigra* L. occasionally),

together with various species of *Salix* and *Alnus glutinosa* Gaertn. near the water's edge. The soil is mostly sandy, with stretches of clay overlaying the sand, and this retains much moisture throughout the year, seldom becoming really dry. The poplar-willow consociation alternates with areas of *Salix*—*Alnus glutinosa* Gaertn.—*Rhamnus frangula* L., in a more open community; but both *Fraxinus oxycarpa* Willd. and *F. Pallisae* are here comparatively infrequent. The *Populus-Salix* sections have a very heavy undergrowth of climbing shrubs, *Smilax excelsa* L. being dominant in this stratum, together with *Vitis silvestris* Gmel., *Periploca graeca* L., *Humulus lupulus* L. and occasionally *Clematis vitalba* L. var. *crenata* Rouy et Fouc. Other shrubs are *Rhamnus frangula* L., *Cornus mas* L., *C. sanguinea* L., *Rubus* spp. Trees of elm of the *Ulmus nitens* group (see 8) and *Quercus pedunculiflora* K. Koch occasionally occur also. In clearings amongst the trees the cultivated crops are usually beans, maize, and cucurbits, among which common weeds observed in September are *Solanum nigrum* L., *Echinochloa crus-galli* L., and *Xanthium italicum* Mor.

1 (b)—Forest "relicts" at a greater distance from the river occur in the form of small woods or copses, usually near a slow stream and have the appearance of oases in a wide stretch of flat sandy plain. Some idea of their character may be gained from the fact that they are a favourite haunt of woodcock in early winter. The soil is more argillaceous as is evidenced by frequent brick-pits (sun-baked), and the *Populus-Salix* consociation seems to give way to one of poplar with ash, or of oak and elm with poplar. Two areas near Bekki Ovasi are typical:

(i) In the eastern part of these copses are the two species of *Fraxinus* (*F. oxycarpa* Willd. and *F. Pallisae* Wilmott), *Populus canescens* Sm., *Ulmus nitens* Moench and *Quercus pedunculiflora* K. Koch, the latter only occasional. The undergrowth of *Smilax excelsa* L. is remarkably dense and almost impenetrable but certain species seem to make headway against it, notably *Cornus sanguinea* L. and *Crataegus monogyna* Jacq., while ash and elm seedlings are to be met with, even in the dense parts. The frequency of elm seedlings is quite remarkable, though, unless the young plants are dug up, it is a matter of difficulty to establish whether they are seedlings or suckers, the latter also being quite plentiful.

This is the section in which *Fraxinus Pallisae* occurs in the greatest numbers, about equally with *F. oxycarpa*, the two being frequently locally co-dominant; the two species can be readily distinguished after a little practice, *F. Pallisae* having the lighter foliage on account of the indumentum, and in this particular locality it shows the autumn tints earlier, while *F. oxycarpa* is still green, although this statement does not hold good in general. In places here *F. Pallisae* has grown into a fair sized tree perhaps 30 ft. high, with a graceful rounded crown about 20 ft. in diameter; the trunk of such a specimen may exceed 2 ft. in diameter at 5 ft. from the ground level.

In such communities as this the villagers often drive paths through the dense undergrowth in order to cut firewood, the poplars being frequently the first to suffer; and it seems likely that after a transient stage of poplar suckers, elm suckers, and ash, the elm comes to dominate the community, perhaps leading up to the open elm woods or "groves" which are a prominent feature of the vegetation of the plain. This interesting community would repay a closer investigation to throw light on the dynamics of its development. It is to be noted that the two species of ash do not escape the usual pollarding for firewood, so that the normal shape of the crown is not often to be seen. The normal shape of the crown of any tree except the poplar is an unusual sight.

To recapitulate the species prominent in this community:

Tree Layer: *Populus canescens* Sm. Co-dominant with *Fraxinus* spp.

Fraxinus oxycarpa Willd. } Verging towards local
F. Pallisae Wilmott } dominance.

Ulmus nitens Moench.

Quercus pedunculiflora K. Koch.

Shrub Layer: *Smilax excelsa* L. Dominant.

Periploca graeca L. Frequent: many seedlings.

Vitis silvestris Gmel. Frequent.

Cornus sanguinea L. Occasional.

Crataegus monogyna Jacq.

Rubus sp. (probably No. 1109, which is *Rubus rusticanus* Merc.) In more open places.

Rosa sp.

Herb Layer: This is absent in the dense parts, except for occasional tufts of *Carex remota* L. and seedlings of elm, oak, ash, and *Periploca graeca*.

In the more open parts: suckers of poplar and ash, young plants of *Smilax excelsa*, with

Pulicaria vulgaris Gaertn., *Erigeron canadensis* L.,

Eupatorium cannabinum L., *Cirsium creticum* D'Urv.,

Bidens tripartita L., *Carduus leiophyllus* Petr.,

Sonchus arvensis L. var. *Eryngium creticum* Lam.,

laevipes Koch, *Cichorium intybus* L. var.

Hypochaeris radicata L., *glabrata* Presl.,

Centaureum umbellatum Gilib., *Odontites serotina* Lam.,

Berteroa incana DC. var. *stricta* Turrill,

Asperula rivalis S. et S., *Polygonum dumetorum* L.,

Chenopodium polyspermum L. In a marshy place with mud pool, nearly dry in summer, *Cyperus longus* L. is dominant, with *Scirpus lacustris* L., *Glinus lotoides* L., *Camphorosma nesciensis* Turrill, *Mentha longifolia* Huds., and *Lycopus exaltatus* L. fil.

Ground Layer: seedlings as noted above. *Hedera helix* L. is sometimes seen, together with a few mosses and fungi. The copse

described above is surrounded by grassland, the dominant grasses being apparently *Cynodon dactylon* Pers. and *Hordeum maritimum* With., but numerous large tufts of *Juncus maritimus* L. are a characteristic feature, and associated with them are *Phacelurus digitatus* Griseb. and *Agropyron elongatum* P. de Beauv. Usual herbs of the grassland are

Odontites serotina Lam.

Teucrium scordioides Schreb.

Lycopus exaltatus L. fil.

Cichorium intybus L. var. *glabrata* Presl.

Verbascum blattaria L.

Eryngium creticum Lam. (this species seems to be extending).

Plantago coronopus L.

Limonium vulgare Mill.

(ii) The western section of these woods is much more open, the oak more frequent in the tree layer, together with *Ulmus* and *Populus canescens*, while the shrub vegetation is richer in species, including *Carpinus orientalis* Mill. (usually found in mountain or hill districts), *Cornus mas* L., *C. sanguinea* L. more rarely, *Ruscus aculeatus* L., and *Crataegus monogyna* Jacq. The climbers are less frequent than in the eastern section, and the tall grass *Erianthus Ravennae* (L.) Pal. de Beauv. penetrates into the clearings and "rides." This grass forms a very distinctive association with tufts of *Juncus maritimus* Lam. just outside the woods, as it also does on the outskirts of the forests fringing the river.

2. In the elm "groves" usually near water, the elm (*U. nitens* Moench) is co-dominant with *Quercus pedunculiflora* K. Koch, and *Fraxinus oxycarpa* and *F. Pallisae* are occasional, as is *Populus canescens* Sm. *Smilax excelsa* L. dominates the shrub layer in many places, and *Ruscus aculeatus* L. is frequent. The community passes into open groves of *Populus* with occasional young trees of *F. Pallisae* in the transition area. The surrounding grassland is very similar to that above described.

3. The open woods of elm and oak (*Q. pedunculiflora* K. Koch) are not so important for the species under consideration. While *F. Pallisae* occurs, it is much more rare than *F. oxycarpa*, both species growing near streams.

In most woodland areas in this region the cutting of trees and pollarding them for fuel, is a strong limiting factor to the development or re-establishment of forest, and the area under forest, even relicts of forest, is steadily diminishing. The increasing rarity of the wild boar is perhaps due to this fact, as well as to closer settlement.

It might be mentioned in conclusion that a closer study of *Fraxinus Pallisae* as occurring in W. Thrace, would show considerable variation in the species as regards the indumentum—possibly the species hybridizes with *F. oxycarpa*.

DISCUSSION.

Two possibilities suggest themselves for consideration: (1) that *F. Pallisae* may be an old species which once had a wide and con-

tinuous distribution but which through geological, palaeometeorological, or other causes has become limited to a few often widely separated areas; and (2) that *F. Pallisae* is a variety of *F. oxycarpa* from the common stock of which it has mutated independently in several localities or, alternately that it is a polygenetic species. These two possibilities must be considered in some detail.

Western Thrace is basically a part of the ancient land mass which still constitutes so large a portion of the central Balkan Peninsula (see 9, pp. 19 seq.). The southern part from the coast to the foot-hills is covered with weathered débris but how far from the Bosphorus-Dardanelles area the Middle Eocene Transgression spread to the west has not been traced. Shallow areas of water are said (10) to have covered, in Oligocene times, the Thracian basin (of the Maritza and Ergene) and to have spread over part at least of what is now the northern Aegean basin. No marine Miocene is known in the northern Aegean though this has been recognized in the district of Enos (along the north western and north central shores of the Gulf of Xeros). To what extent Pontic and Sarmatic waters (largely brackish and freshwater) covered the North Aegean basin is uncertain. A Sarmatic Gulf of some description probably stretched into the Aegean continent from the east (i.e. from the Black Sea area) but was not continuous with the Mediterranean. The Aegean Sea, i.e. saltwater continuous, from the coasts of Thrace, with the Mediterranean proper, was certainly of relatively very recent origin, probably post-Pliocene (11, 12). The probable age is well discussed by Cvijić who gives a concise summary of the available geological data and says "viele dieser Beobachtungen verlangen jedoch, die Entstehung der nördlicher Ägäis zu Ende des Pliozäns und zu Anfang des Diluviums zu versetzen, obwohl sich dieselben tektonischen Vorgänge auch später fortsetzen" (13). The formation of the Aegean Sea by the faulting and sinking of the Aegean continent, which through so much of the Tertiary period had made the continental parts of the Balkan Peninsula a peninsula of Asia, was caused by great earth movements which involved not only subsidence but also elevation in different, though sometimes neighbouring, parts. How far rivers were changed in the general direction of their drainage during this period we do not know but it is not unlikely that a large part of the Maritza or of the Maritza-Ergene system formerly drained into the Black Sea.

The lowland climate of western Thrace may have been warmer in the middle of the late Tertiary times than it is now and slightly cooler in the Ice Age. The Rodopes were glaciated in an isolated discontinuous manner.

We have now to apply these meagre geological data to the question "Can *Fraxinus Pallisae* be an old relict type in western Thrace?" We have seen that *F. Pallisae* is ecologically limited in its present occurrence to river-deltas and fringing forests in the lower courses of rivers. It has not been recorded from the Maritza basin, but relatively little botanical field work has been done in the area

between Enos and Adrianopol. Its occurrence in this area would strengthen the suggestion that the plant represents an old Pontic type which spread westwards during the formation of the North Aegean Basin, perhaps in connection with changed river-courses. With the data available a direct phylogenetic connection between the *F. Pallisae* in eastern Bulgaria and the *F. Pallisae* in western Thrace cannot be proved and one has to turn to the second possibility that their phylogenetic connection is through a common, more widespread parent and one naturally turns to *F. oxycarpa* Willd.

F. Pallisae is usually or always associated with *F. oxycarpa* (1, 2, 3, 4, 5, 6, and Tedd above). In the non-leafy condition the two are indistinguishable apart from the indumentum of the young shoots when viewed under a lens (Tedd). *F. Pallisae* is quite distinct from *F. holotricha* Koehne and from *F. coriariaefolia* Scheele. As this matter has been fully discussed by Wilmott (1) and Mattfeld (2) it need not be further mentioned here, except to express a regret that quite a number of recent authors seem to ignore the facts set out by Wilmott and Mattfeld.

F. oxycarpa is a decidedly polymorphic species. Lingelsheim (14) describes eight varieties and a number of forms. Of these, var. *oxyphylla* (Marsch. Bieb.) Lingelsh. f. *Bornmülleri* Lingelsh., from Corfu, has "foliola subtus basin versus crispulo-griseo-villosa," and var. *tamariscifolia* (Vahl) Lingelsh. has "foliolorum rhachis pilosa." The remainder, so far as is stated in the descriptions have glabrous mature leaves.

An examination of the material of *F. oxycarpa* in the collections at Kew shows that plants occur with mature leaves quite glabrous but that other specimens have a varying amount of indumentum on the lower surface in quite mature leaves. This is usually present as a compact narrow belt on both sides of the midrib in the lower quarter or third of the leaflet. The belt is sometimes rather wider on one side than on the other and may extend higher up the leaf on one side (in lateral leaflets on the side towards the leaf apex). More rarely the hairs spread (in the lower part of the leaf on the under surface only) nearly or quite to the margins. Most, if not all of the hairs are simple, but they sometimes arise in small tufts and thus and by their overlapping sometimes give a false appearance of branching. As seen under the low power of the compound microscope they are very similar to the hairs on the leaflets of *F. Pallisae*. Hairs have, however, not been observed on the upper surface of the leaflets, on the leaf rhachis of mature leaves, or on the young stems.

In the shape of the leaflets *F. oxycarpa* and *F. Pallisae* show a very similar range. Narrower and broader, longer and shorter, more or less coarsely toothed, more or less acuminate leaves occur in *F. oxycarpa* as the species is now usually (and probably correctly) accepted and similar variations appear in the material of *F. Pallisae* described by Wilmott and in that collected by Tedd.

The fruit variations, so far as they are known, are again parallel in *F. oxycarpa* and *F. Pallisae*. Contorted fruits (as in *F. Pallisae* var. *gyrocarpus* Wilmott) may be found on plants of *F. oxycarpa* though whether they indicate a real genetical variety is quite uncertain. The fruit apex ranges in both (as it also does in *F. excelsior*) from acutely acuminate to obtuse, rounded, or even retuse. The characters of the fruit apex are probably, in part, dependent on a number of genes. At least, a given shape is frequently relatively constant for an individual plant.

Wilmott did not have flowering material when he described *F. Pallisae*. Mattfeld (2) described flowers from a specimen collected by Sintenis in the Dobruja. One hermaphrodite flower from this material is figured (2, p. 281, fig. 6). The following is a translation of Mattfeld's description: "The inflorescence is many flowered, the branches are at first thickly hairy, but later become more or less glabrous. The flowers are on long (1 cm. and more) and thin pedicels, they are hermaphrodite; the young ovary is (without the style) about 2 mm. long, in the lower half covered thickly with long white hairs and moreover at the base especially thickly covered with scale-hairs; it ends with a thin style 2-2.5 mm. long (excluding the stigmatic arms), the style is split into two linear or nearly linear—lanceolate 1-1.5 mm. long arms. At its base are two stalked stamens; the filaments are about 1 mm. long, and thus reach to half the length of the ovary or even somewhat more; the anthers contain normally formed pollen."

A study of the excellent series of flowering specimens collected by Tedd makes some comments on this description desirable. In the Thracian plants the inflorescence branches are glabrous or only slightly hairy; the pedicels are rarely up to 1 cm. long, the average length being 0.5 cm. or less. The flowers may be hermaphrodite (as most of the flowers in *Tedd* 1324), or male (as most of the flowers in *Tedd* 1320, 1322), or showing various stages in the abortion of the gynoeceum (as in *Tedd* 1321 and 1323). The young ovary shows a varying development of hairs but is rarely so evenly hairy with fine spreading hairs as shown in Mattfeld's figure. "Scale-hairs" are present (they are not shown in Mattfeld's figure). The most important point however, is the shape of the stigmatic (or stylar) arms. Mattfeld describes them as "lineal oder fast lineal-lanzettliche," and figures them as narrow, somewhat narrowed upwards separated right from the base, at first divergent and then converging at their apices. In the Thracian specimens the stigmatic arms are parallel and pressed together by their inner surfaces except for a slight divergence at the apex. Usually they are quite short but do attain to about 1.5 mm. in length in hermaphrodite flowers of *Tedd* 1323 where they are of the same narrow shape as in the flower figured by Mattfeld, but are not diverging. There is a very considerable range in stigma shape in the remaining specimens, in addition to differences due to age.

Thus, apart from the degree of development and distribution of the indumentum, no constant differences which can be really regarded as specific can be found between *F. oxycarpa* and *F. Pallisae*. The evidence would seem to indicate that, whether regarded as a variety of *F. oxycarpa* or as a species closely related to it, *F. Pallisae* may well have originated independently in river deltas of the Pontic and Aegean from *F. oxycarpa*.

It is very desirable that more research on the variation of *F. oxycarpa* should be undertaken in the Balkan Peninsula. Series of specimens from all the districts would be welcomed at Kew as would also ripe fruits with viable seeds for raising living material. A study of the nature and distribution of variations of common and widely spread species may yield more valuable scientific data than the stimulation felt on discovering a new endemic or some other rarity.

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Addendum.

Camphorosma nestensis Turvill.

A *C. monspeliaca* L. foliis floribusque valde hirsutis, inflorescentiis laxioribus, floribus gynomonoeciis, perianthii lobis lateralibus leviter extrorsus curvatis, stylo (ramis exclusis) brevior, differt.

Planta inferne suffruticosa, caulibus teretibus paulum ramosis saepe purpureis plus minusve prostratis vel ascendentibus. *Folia* subulato-linear, obtusa, 3-4.5 mm. longa, 0.3-0.5 mm. lata, hirsuta, in pagina superiore complanato-sulcata. *Inflorescentia* laxa, ramis lateralibus brevibus densioribus interdum praedita. *Flores* sessiles, in foliorum axillis solitarii. *Perianthium* longe hirsutum in floribus femineis 1.5-2.5 mm. longum, lobis lateralibus foliis subsimilibus complanatis leviter extrorsus curvatis 0.75-1.5 mm. longis (supra tubum), lobo adaxiale et lobo abaxiale vix 0.5 mm. longis (supra tubum) 0.5-0.75 mm. latis latissime membranaceo-marginatis, in floribus hermaphroditicis 4 mm. longis, lobis lateralibus 2.5 mm. longis leviter extrorsus curvatis, lobo adaxiale et lobo abaxiale 1.5 mm. longis erectis. *Stamina* (in floribus hermaphroditicis) 4; antherae 1.3-1.75 mm. longae; filamenta 2.25 mm. longa. *Ovarium* compressum, ambitu ellipticum vel obovato-ellipticum, circiter 0.6 mm. altum et 0.5 mm. latum; stylus 0.5 mm. longus (ramis exclusis), ramis 3.5 mm. longis.

W. THRACE: Bekki Ovasi in flat sandy "pans" in grassland near woods, 20.9.1933. *Tedd* 1242.

The genus *Camphorosma* contains about ten known species. The main distribution area is from southern Russia to Central Asia with the north eastern part of the Orient in Boissier's sense. This area is, of course, exceptionally rich in members of the *Chenopodiaceae*. The most widespread species of the genus is *Camphorosma monspeliaca* L. which ranges through most parts of the Mediterranean Region to Central Asia. As one so often finds with the most widely spread species of a taxonomic group, it is also the most polymorphic but does not appear to have received an intensive study from modern botanists. Litwinow (in Trav. Mus. Bot. Acad. Imp. Sci. St. Pétersb. 2, 86; 1905) deals with the Russian variations of the species and describes two varieties; var. *pilosum* calyce ex toto breviter piloso v. basi glabrescente, and var. *hirsutissimum* calyce ex toto longius rufo-(v. rarius albo-) hirsuto, interdum basi glabrescenti. The latter variety shows some morphological resemblances to *C. nestensis* but the characters noted in the differential diagnosis, apart from the indumentum, serve to distinguish the species. *C. monspeliaca* L. has been recorded from western Thrace but no specimens from this area have been seen by the writer.

C. ovata W. et K. and *C. annua* Pall, have a superficial resemblance to *C. nestensis* but differ, *inter alia*, in having definitely annual slender descending roots.

C. nestensis is named from the old name Nestus, of the River Mesta (Karasu). The gynomonoecious condition is interesting, the female flowers being much smaller than the hermaphrodite. In

some plants (or parts of plants) the former are present almost alone, in other plants hermaphrodite flowers predominate, with the relative number of female flowers increasing towards the ends of the partial inflorescences.

XII—THE FLORA OF MADRAS: VIII.*

With the publication of part 10 (pp. 1689-1864), devoted entirely to the *Gramineae*, the flora is practically complete. The final part will contain the addenda, errata, indices, etc. Mr. Fischer has made the following notes in continuation of those which have appeared in these pages on the issue of previous parts.

NOTES ON THE FLORA OF MADRAS: PART X.

C. E. C. FISCHER.

POGONATHERUM.

Page 1714. *P. crinitum* Trin. In Fl. Br. Ind. 7, 141, the distribution is given as "throughout India." There has been considerable confusion between this species and *P. paniceum* Hack. (= *P. saccharoideum* Beauv.). In my opinion all the specimens of the genus from S. India belong to this latter species.

THELEPOGON.

T. elegans Roth. Malabar is cited in Fl. Br. Ind. 7, 148 as part of its habitat, but this is taken from Stock's labels reading "Konkan and Malabar," and his plants were collected in the Bombay Presidency. Having seen no specimens from the Madras area I have excluded the genus.

PSEUDOPOGONATHERUM.

Page 1716. *P. contortum* A. Camus (= *Pollinia articulata* Trin.) Fl. Br. Ind. 7, 110 cites "Nilgiri Hills; the Wynad, Heyne" among the localities, but the sheet giving this information is *Eulalia tristachya* O. Kt. (= *Pollinia argentea* Trin.).

MICROSTEGIUM.

Page 1716. *M. ciliatum* A. Camus (= *Pollinia ciliata* Trin.) Fl. Br. Ind. 7, 116 quotes "Nilgiri Hills, Wight" as one of the habitats. The only sheet of this species in the Kew Herbarium of Wight's collection gives no locality. It may, therefore, just as well have been obtained in the Pulney Hills from which mountains and from Travancore other specimens of the species have been derived.

ISCHAEMUM.

Page 1717. A difficult genus the species of which have been much confused in herbaria. The statements found in Floras regarding the sex of the florets are often untrustworthy, as the character is variable, and also the stamens tend to disappear at an early stage leaving no trace. In the same species the glumes may be quite smooth at first, later becoming noduled and ridged as they harden. The genus as dealt with in the Fl. Br. Ind. has been split into three, the other two being *Pollinidium* Stapf ex Haines and *Sehima* Forssk.

* Continued from K.B. 1931, 266

Page 1721. *I. aristatum* Linn. is described in Fl. Br. Ind. 7, 126 and by Hackel in Monogr. Androg. 202 as having nodulose margins to the lower glume of the sessile spikelets. It is so figured by Rang Achariya and Tadulingam in Some South Indian Grasses, fig. 130. The sheet of this species in the Linnean Herbarium has the lower glumes quite smooth. The figure quoted above is certainly a new species which I have called *I. Rangacharianum* (K. B. 1933, 352). The two sheets quoted by Cooke in Fl. Bomb. Pres. are also probably new species.

I. ciliare Retz. is identical with *I. aristatum* Linn. as established by Stapf in MS. in Kew Herbarium.

Page 1722. *I. hirtum* Hack. I have seen no specimens of this species from the Madras region; those quoted in Fl. Br. Ind. 7, 135 from the Nilgiri Hills are *I. nilagiricum* Hack.

I. molle Hook. f. In the Fl. Br. Ind. 7, 128 no mention is made of any rugosity on the lower glume of the sessile spikelets, but the Central Provinces sheet quoted has definite shallow transverse rugosities across the glumes. In Dalziel's sheet, though most of the glumes are smooth, here and there some have slight nodules on the margins, but they are much concealed by the indumentum.

CAPILLIPEDIUM.

Page 1730. *C. Huegelii* Stapf. After examining an extensive series of *Andropogon Schmidii* Hook. f., I have found it impossible to separate it from *A. Huegelii* Hack. It is a variable species; the leaves are as often smooth as scabrid, the glumes may be villous, scaberulous or glabrous on the back, sometimes all three on the same plant.

AMPHILOPHIS.

Page 1732. *Andropogon montanus* Roxb. Fl. Br. Ind. 7, 176, is represented apparently only by a drawing in the Roxburgh Collection of drawings in the Kew Herbarium. I agree with Haines, who, in Bot. Bih. & Or. 1028, states that it is probably identical with *A. intermedius* R. Br. = *Amphilophis glabra* Stapf.

MANISURIS.

Page 1759. This genus was made for and first used in the combination *M. Myurus* Linn. Mant. 2, 164 and 300 (1771), and must be retained in conjunction with that species, which has been incorrectly relegated to *Rottboellia* by Bentham. It should include also the section *Peltophorus* Hack. of *Rottboellia*. For *Manisuris* as applied to the species *M. granularis* Linn. f. in Fl. Br. Ind. 7, 159, O. Kuntze's name *Hackelochloa* must be adopted.

OPLISMENUS.

Page 1778. *O. undulatifolius* Beauv. Fl. Br. Ind. 7, 66. In his completion of Trimen's Handb. Fl. Ceyl. 5, 169, Hooker expresses the opinion that this species is a form of *O. compositus* Beauv. with a simple terminal spike of sessile spikelets. In several specimens of the latter species from S. India short lateral racemes occur here and there. I have, therefore, sunk the first-named species under the latter.

HOLCOLEMMMA.

Page 1779. Fl. Br. Ind. 7, 43 gives "Southern Deccan Peninsula, Wight" as well as Ceylon as the habitat of *Panicum canaliculatum* Nees. All the specimens of this species in the Kew Herbarium show definite evidence of collection in Ceylon except three sheets of Wight's herbarium which bear merely the printed label "Peninsula Ind. orientalis," which in that collection covered Ceylon as well. It is possible, therefore, that the species does not occur in S. India, but in view of the doubt, I have included it under *Holcolemma canaliculatum* Stapf et Hubbard.

PANICUM.

Page 1783. *P. Gardneri* Thw. was included in Fl. Br. Ind. 7, 26 under *Isachne*, but the two lemmas being dissimilar Thwaites correctly transferred the species to *Panicum* in Enum. Pl. Zeyl. 359.

PENNISETUM.

Page 1792. *P. Alopecuros* Steud. Fl. Br. Ind. 7, 84, is an invalid combination as it was preceded by *P. alopecuros* Jacq. *Panicum hordeiforme* Thunb., quoted as a synonym, is a different plant. The earliest valid name for the species appears to be *Pennisetum Hohenackeri* Hochst. ex Steud., founded on Hohenacker's sheet No. 930 collected in the Nilgiri Hills.

ISACHNE.

Page 1797. *I. australis* R. Br.; Fl. Br. Ind. 7, 24. It is doubtful that this species occurs in India. The specimens from S. India so named in the Kew Herbarium, including those determined by Hooker, do not agree with typical specimens from Australia, and are, in my view, to be referred to *I. dispar* Trin., *I. elegans* Dalz. and *I. miliacea* Roth. In the typical *I. australis* the two lemmas are very similar in size and structure and are quite glabrous.

ARUNDINELLA.

Page 1801. *A. nervosa* Nees and *A. setosa* Trin. Fl. Br. Ind. vii. 70. Having examined a considerable number of specimens of these two, I find myself unable to distinguish them by any constant character. There is a complete series from quite glabrous to very setose glumes. There are similar intermediates in other features and others again are variable. I have, therefore, united them under the earlier binomial *A. setosa*.

A. braziliensis Raddi. It is probable that more than one species are comprised under this name in Fl. Br. Ind. 7, 73 and that none is identical with Raddi's plant. For the S. India species I have adopted the name *A. nepalensis* Trin. which was cited as a synonym in the above-mentioned work.

SETARIA.

S. viridis Beauv. In Fl. Br. Ind. 7, 81, "Nilgiri Hills? (perhaps introduced) Heyne (in Herb. Wallich. n. 8640D)" is included in the distribution of this species. There is nothing on the sheet quoted to indicate either the collector or the locality of collection. On the combined label for the whole set of sheets under no. 8640,

however, is inscribed "D. Hb. Heyneon." In the Wall. Cat. Heyne is usually indicated by "Hb. Heyn." The only other sheet in the Kew Herbarium of this species that might be attributed to S. India is part of a sheet of Herb. Rottler, which gives no locality whatever and I have seen no other specimens that might be considered to come from S. India. It is known that the members of the Society of "United Brothers," in which both Heyne and Rottler were included, exchanged specimens from various parts of India. I consider, therefore, that the two sheets quoted were collected from elsewhere and have excluded the species.

AGROSTIS.

Page 1810. *Calamagrostis pilosula* Hook.f. and *C. Smidii* Hook.f. Fl. Br. Ind. 7, 263 and 264 respectively. In these two species the beard of the callus is longer than is usual in *Agrostis*, but is still less than half as long as the lemma. I consider that they cannot be separated from the species of that genus by any satisfactory character and I have brought them under it.

GARNOTIA.

Page 1812. *G. tenuiglumis* Stapf ex Hook.f. in Fl. Br. Ind. 7, 242 is based on a single sheet: Wight 3247, which lacks the basal part of the plant. It is shown to differ from *G. scoparia* Stapf ex Hook.f. by very slight and rather vague characters, the clearest being that the nerves of the upper glumes are said to be solitary in the former and three in the latter. Dissection of the specimen referred to, however, shows three nerves in the upper glumes, though sometimes the lateral nerves are obscure. The other differences are variable and vanish when a full set of specimens is examined. I have, therefore, united the two under *G. scoparia*.

TRAGUS.

Page 1813. *T. racemosus* All. Mr. Hubbard has drawn my attention to the fact that the Indian plant referred to under this name in Fl. Br. Ind. 7, 97 and in Indian Floras generally, is not identical with the European species, though superficially very like it. I have verified that they differ as follows: In the Indian plant the lower glume is slightly shorter, broader, deeper and more acutely acuminate, 5-ribbed and thin and semi-transparent between the ribs; the spikelets are invariably binate and face one another so as to appear as if the two spikelets are the two glumes of a single gaping spikelet. In *T. racemosus* the spikelets are 3-6 on short lateral branchlets, the lower glumes are usually 7-ribbed and opaque and thick between the ribs. Hackel considered the Indian plant to be a var. *biflorus*, but it seems to be more practical and satisfactory to restore it to specific rank under its earliest independent name: *T. biflorus* (Roxb.) Schult in Mant. ii, 205 founded on *Lappago biflora* Roxb. Fl. Ind. 1, 2284.

LOPHOLEPIS.

Page 1813. Both in Fl. Br. Ind. 7, 98 and Handb. Fl. Ceyl. i, 188, the number of stamens is given as two. In a number of

dissections, whenever the stamens could be clearly distinguished, I have counted three.

POLYTOCA.

P. punctata Stapf ex Hook.f. in Fl. Br. Ind. 7, 102 "Deccan Peninsula, Rottler" is cited as the habitat in India. On Rottler's sheet, however, there is no evidence of provenance. It is known that Rottler received specimens from other collectors and from other lands. As the grass is known from Java and elsewhere outside India and I have seen no sheets from any part of India, I have excluded the species.

SPOROBOLUS.

Page 1817. *S. commutatus* Kunth. Ranga Achariya and Tadalangam in S. S. Ind. Grasses, 230, have treated this as a good species separable from *S. coromandelianus* Kunth because the pedicels and spikelets droop and are not appressed. I find that in the type of *S. coromandelianus* and in a sheet determined as such by Ranga Achariya, that some of the spikelets are appressed and others are patent. I do not think that the difference is constant or specific and I follow Fl. Br. Ind. 7, 253 in uniting them.

ERAGROSTIS.

Page 1826. *E. interrupta* Beauv. is based on *Poa interrupta* R. Br., an Australian grass not found in India. *P. interrupta* Lam. is an Indian grass, but the combination for this species under *Eragrostis* is invalid being preoccupied. The next oldest name for the species appears to be *Poa japonica* Thunb. By the kindness of the Director of the Upsala Museum, I have been able to examine Thunberg's type and find it identical with *Eragrostis interrupta* Hook.f. non Beauv. var. *tenuissima* Stapf in Fl. Br. Ind. 7, 316. It is more practical to separate this variety from the other two described in the Fl. Br. Ind., viz. *Koenigii* and *diarrhena* and it becomes *E. japonica* (Thunb.) Trin. The second of the two other varieties I have restored as an independent species as *E. diarrhena* (Schult.) Steud., with the other as variety *Koenigii*.

Page 1828. *E. coromandeliana* Trin.: Fl. Br. Ind. 7, 326. After carefully examining a large number of specimens of this and of *E. bifaria* Wight, I am unable to separate them. Roth in Nov. Pl. Sp. 71 in Obs. I stated that he could only distinguish them on Vahl's description (in Symb. Bot. 2, 19) of the rhachis of *Poa bifaria* as: "rhachis altero latere planus, altero convexus." This, however, is probably a slip, for in all the specimens, whether determined as *coromandeliana* or *bifaria*, the rhachis is linearly alveolate to house the glume. The difference noted in Fl. Br. Ind. regarding the distinct wings of the paleas does not hold good since the width of the wings varies very much in the same spike and are often distinct in specimens determined as *E. coromandeliana* on other grounds. Willdenow also was persuaded of the identity of the two as shown by the footnote in Ges. Naturf. Fr. Berl. Neue Schrift. 4, 191, where *Poa coromandeliana* was first described. *Poa bifaria*

Vahl being the earlier name it must be adopted for the combination *Eragrostis bifaria* (Vahl) Wight ex Steud.

MELANOCENCHRIS.

Page 1831. *Gracilea nutans* Koen. ; Fl. Br. Ind. 7, 283. This combination was first published by Rottler in Ges. Naturf. Fr. Berl. Neue Schrift 4, 218 (1803) in synonymy under *Pommereulla monoica*. No validity, therefore, can be claimed for either the generic or the specific epithet. The correct name when segregated from *Pommereulla* is *Melanocenchris*, instituted by Nees in Proc. Linn. Soc. 1, 95 (1841). Nees, however, did not use the combination which is correct under the present international rules. In Rev. Gen. 780 (1891) O. Kuntze has stated the correct combination but has based it on Roth's name in Nov. Sp. 33 (1821), where Roth described a plant received from Heyne, who may have had the name from Rottler and attached it erroneously to his specimen. Roth described the leaves of his plant as "complicata, canaliculata, apice convoluta," a description which agrees well with *M. Royleana* Nees, but not with *Pommereulla monoica* Rottl. of which the leaves are stated to be "plana." Roth's name, therefore, is invalid, and in consequence, also O. Kuntze's combination under *Melanocenchris*. Rottler's name was validly published and the correct combination becomes *Melanocenchris monoica* (Rottler) C. E. C. Fischer.

CYNODON.

Page 1835-6. *C. intermedius* Rang. et Tad. and *C. Barberi* Rang. et Tad. I have examined a number of specimens of these two plants and of *C. Dactylon* Pers. Of the characters given for the first two by the authors I have found only one to be constant and that is that in *C. Barberi* the lemma is never longer than the upper glume. The hairs in this species I have found to be minutely knobbed under the lens and not truly clavate, nor are they invariably present. I have not found such hairs in *C. intermedius*. The leaves of all three plants vary considerably and I cannot base any distinction on those organs. For these reasons I have considered it advisable to reduce *C. intermedius* to a variety of *C. Dactylon*.

TEINOSTACHYUM.

Page 1860. *T. Wightii* Bedd. For. Man. ccxxxlii ; Fl. Br. Ind. 7, 410. This combination was based on *Bambusa Wightii* Munro, Trans. Linn. Soc. 26, 111, which was described from vegetative parts only. In Ann. Roy. Bot. Gard. Calc. 7, 127, Gamble has shown that this plant, collected by Wight, is an *Ochlandra* and not identical with Beddome's which is a *Teinostachyum*. Under the international rules the trivial *Wightii* must be retained under *Ochlandra* and is not available for Beddome's plant, and as no other specific epithet appears to have been applied to it another must be provided. I have proposed to call it *Teinostachyum Beddomei*.

OCHLANDRA.

Page 1863. *O. Rheedei* Benth. ex Gamble ; Fl. Br. Ind. 7, 418. The earliest name given to this species is *Bambusa scriptoria* Dennst.

in Schleuss Herb. Malab. 31 (1818). It precedes the first use of the trivial *Rheedei* in the combination *Beesha Rheedii* in Kunth Rev. Gram. 1, 141 (1829) and must therefore be adopted as *Ochlandra scriptoria* (Dennst.) C. E. C. Fischer.

Page 1864. *O. Brandisii* Gamble : Fl. Br. Ind. 7, 420. This is the species first described as *Bambusa Wightii* Munro as stated above and the epithet *Wightii* must be retained in the combination *Ochlandra Wightii* (Munro) C. E. C. Fischer.

Since the issue of part 9 the following case has arisen and I take the opportunity of making the correction.

FIMBRISTYLIS.

1658. *F. dichotoma* (Linn.) Vahl and *F. annua* R. et S. var. *diphylla* (Retz.) Kuek. Mr. J. E. Dandy has shown me that the second of these combinations is incorrect and must be replaced by the first, which hitherto has been consistently applied to the wrong species. He has been good enough to let me have his notes and on them the following remarks are mainly based :—

F. dichotoma Vahl Enum. Pl. 2, 287 (1806) is founded on *Scirpus dichotomus* Linn. Sp. Pl. 50 (1753). Linnaeus gave this binomial to a plant listed in his own Fl. Zeyl. 16, no. 40 (1747) as "*Scirpus culmo triquetro nudo . . .*" which was based on "*Gramen parvum, . . .*" Herm. Zeyl. 26 and "*Gramen Cyperoides Maderaspatanum Juncelli Gesneris . . .*" Pluk. alm. 179, t. 119, f.3. Fortunately the type specimens of both these latter authors are preserved at the Brit. Mus. Nat. Hist. They are identical and are also identical with *Scirpus diphyllus* Retz. Obs. 5, 15 (1789). This latter has been placed by Kuekenenthal under *Fimbristylis annua* (All.) Roem. et Sch., Syst. 2, 95 (1817), based on *Scirpus annuus* All. Fl. Pedemont, 2, 277 (1885), as var. *diphylla* vide Fl. Pr. Madras, 1658 (1931). It follows that *Scirpus dichotomus* Linn. being identical with *S. diphyllus* Retz. the so-called *Fimbristylis dichotoma* must receive another name. The earliest independent name applied to this second plant appears to be *Scirpus bis-umbellatus* Forssk. Fl. Aegypt.-Arab. 15 (1775).

These facts have already been observed by P. Bubani, who made the combination *Fimbristylis bis-umbellata* in his Dodecanthia, 30 (1850) without, however, stating the origin of the specific epithet. Though he makes no reference to Forsskaal's book, it is evident that he adopted the trivial epithet from that work since he quotes Webb et Berthel. Phyt. Canar. 3, sect. ult. 368 (1840) in which *S. bis-umbellatus* Forssk. occurs as the second binary synonym cited under *F. dichotoma* Vahl, *S. dichotomus* being the first.

The synonymy of the two species is as follows :—

Fimbristylis bis-umbellata (Forssk.) Bubani, Dodecanth. 30 (1850). *Scirpus bis-umbellatus* Forssk. Fl. Aegypt-Arab. 15 (1775). *Scirpus niloticus* J. F. Gmel. in Linn. Syst. Nat. ed. 13, 2, 126 (1791). *Fimbristylis dichotoma* (Linn.) Vahl Enum. Pl. 2, 287 (1806) pro parte ; C. B. Clarke in Dur. et Sch. Consp. Fl. Afr. 5, 602 (1894) and in Dyer Fl. Trop. Afr. 8, 414 (1902). *Fimbristylis dichotoma*

Vahl var. *villosa* Vahl, l.c. (1806). *Fimbristylis annua* (All.) Roem. et Sch. var. *diphylla* (Retz.) Kuek. ex C. E. C. Fischer Fl. Pr. Madras, 1658 (1931).

Fimbristylis dichotoma (Linn.) Vahl Enum. Pl. 2, 287 (1806), excluding var. *villosa*. *Scirpus dichotomus* Linn. Sp. Pl. 50 (1753). *Scirpus annuus* All. Fl. Pedemont. 2, 277 et 3, t.88, fig. 5 (1785). *Scirpus diphyllus* Retz. Obs. 5, 15 (1789).

In making a new variety *villosa* under *Fimbristylis dichotoma* Vahl in Fl. Pr. Madras, 1658, I overlooked the existence of Vahl's variety of the same name quoted above. A new name has to be applied, therefore, and I propose to call it **F. bis-umbellata** Bub. var. *hirtistyla* C. E. C. Fisch.

XIII.—STUDIES IN THE ERICALES: * II.—A NEW GENUS OF VACCINOIDEAE FROM BORNEO. H. K. AIRY-SHAW.

Among the many interesting novelties obtained by the Oxford University Expedition to Sarawak in 1932 is a remarkable epiphyte with something of the habit of certain South American species of *Macleamia*, such as *M. rotundifolia* Sod. et Hoer. and *M. amplexicaulis* A. C. Smith. Its closest affinity, however, lies elsewhere, as will be seen from the descriptions and discussion below. The plant was collected on three occasions, fortunately representing all stages from bud to ripe fruit.

Cymothoe Airy-Shaw [Ericaceae—Thibaudieae], gen. nov., ab *Iaera* H. F. Copel. petiolis glandula utrinque destitutis, floribus tetrameris, seminibus numerosis (circiter 15 in quoque loculo), a *Costera* J. J. Smith his characteribus et insuper calycis dentibus haud glanduloso-apiculatis, corolla alte (saltem duas partes) sympetala, staminibus corollae lobis numero duplis (8), antheris haud clavato-papillosis bene distincta. (Κυμοθήη, quaedam Nereis).

Calycis tubus cum pedicello continuus, oblongo-campanulatus; limbus breviter cupularis, brevissime 4-dentatus. *Corolla* infundibulari-campanulata, usque ad tertiam partem 4-loba, lobis aestivatione imbricatis sub anthesi erectis. *Stamina* 8, inclusa: filamenta ciliata; antherae dorso ecalcaratae, papillosae, in tubulos liberos thecis subduplo longiores poro apicali oblongo introrsum dehiscentes productae. *Discus* parvus, integer. *Ovarium* 4-loculare; ovula in loculis numerosa; placentatio difficillime observata, sed ut videtur axilis; stylus gracilis, stigmatibus truncato. *Fructus* breviter ovoideus, subexsuccus, obsolete 4-locularis, polyspermus. *Semina* subcuneiformia, obtuse angulata, testa firma crebre elevato-reticulata pallide brunnescente mucilaginosa.

Frutex parvus, laxis, glaber, epiphyticus. Folia alterna, breviter petiolata, ovata usque saepius orbicularia et basi auriculata,

integerrima, persistentia, palmatim nervosa, nervis manifestis. Flores parvi, axillares vel extra-axillares, solitarii vel gemini, epedunculati, longe et gracillime pedicellati, alabastro nutantes corolla conico-oblonga, sub anthesi erecti, rosei.

Cymothoe cyclophylla Airy-Shaw, sp. nov. (adhuc unica).

Frutex parvus, saepe epiphyticus, laxa subscandens, 2–3 m. alta. *Ramuli* rigidi, parce et irregulariter ramosi, optime teretes, usque 4 mm. diametro, cortice vetustiore cinereo iunior castaneo. *Folia* suborbicularia, multo rarius latissime ovatis vel elliptico-ovatis, 5–12 cm. diametro (rarius 5.5–6.5 cm. longis et 4–6 cm. latis), basi rotundata usque cordata et saepe auriculato-imbricata velut amplexicaulia, auriculis magnis rotundatis, apice optime rotundata vel levissime retuso-truncata, margine plano integerrimo, rigide coriacea, glaberrima, paginis inter se simillimis sed plerumque superiore nitidula inferiore obscura; costa et nervi utrinque elevati; nervi primarii utroque latere costae 3–4, ab ima basi eius palmatim orti, quam costa vix tenuiores, marginem versus late arcuati atque varie sed regulariter anastomosantes; nervi secundarii a costa superne pinnatim orti, etiam a nervis primariis latere exteriori orti, cum proximo nervo primario anastomosantes; venuli ultimi manifeste et crebre reticulati; petioli brevissimi, subnulli usque 7 mm. longi, robusti, basi articulati, glandulis lateralibus ut videtur nullis vel saltem obscurissimis. *Flores* valde irregulariter editi, axillares vel saepe manifeste extra-axillares, interdum ut videtur e ramis specialibus aphyllis gracilioribus orti, fasciculati, fasciculis 1–2-floris basi perulis nonnullis minutis fuscis suffultis; pedicelli gracillimi, 1–2.7 cm. longi, paullo supra basin bracteolis binis ovato-oblongis acutis vix 1 mm. longis plus minus adpressis instructi, apice sensim incrassati, in ovarium sine articulo transeuntes, glaberrimi, alabastro apice cernui, sub anthesi stricti. *Ovarium* 4-loculare, sub anthesi breviter oblongum, 1–1.5 mm. longum et latum, tetragonum, angulis lobis calycinis alternantibus, glabrum, nitidulum. *Calyx* late cupularis, 1–2 mm. longus, brevissime et latissime 4-lobus, subcoriaceus, glaber, nitidulus, lobis latissime triangularibus subcuspidatis acutiusculis basi 1.5–2 mm. latis. *Corolla* alabastro conico-oblonga, sub anthesi infundibulari-campanulata, 6–7 mm. longa, rosea, glabra: tubus circiter 4 mm. longus; lobi deltoideo-ovati, 2–3 mm. longi et basi subaequilati. *Stamina* 8, inclusa, aequalia, tota circiter 5 mm. longa: filamenta brevia, applanata, circiter 2 mm. longa, ima basi corollae adnata, marginibus praecipue superne longe ciliata, ciliis adscendentibus; antherae lineari-lanceolatae, 3–4 mm. longae, paullo supra basin dorsifixae, basi obtusae, papillosae, dorso ecalcaratae, in rostra omnino libera teretia obtusiuscula poro apicali oblongo introrso dehiscentia sensim angustatae. *Discus* inconspicuus, annularis, integer. *Stylus* modice gracilis, 5–6 mm. longus, teres, glaber, stigmatibus truncato. *Fructus* maturus breviter ovoideus, 4–5 mm. diametro, calyce persistente erecto vel incurvo coronatus, ut videtur durus, sub-

* Continued from K.B. 1935, p. 53.

exsuccus. *Semina* obtuse angulata, 1-1.5 mm. longa, 0.5-1 mm. lata, testa pallide castanea pulcherrime foveolato-reticulata.

SARAWAK. In moss forest, Dulit Ridge, 1230 m., 12 Sept. 1932, *Richards* 1740: "Small woody scrambler, c. 3 m. long. Flowers mauvish pink. Leaves thick and leathery." In white sand-forest, Ulu Koyan, 900 m., 15 Sept. 1932, *Richards* 1829: "Straggling shrub. Corolla pink, conical." Open moss-forest on exposed peak, Dulit Ridge (commoner in shady moss-forest), 1400 m., 17 Sept. 1932, *Richards* 1890 (typus, Herb. Kew.): "Straggling woody climber, often epiphytic, c. 2 m. high. Corolla pink."

The affinities of the group of genera to which *Cymothoë* belongs have hitherto remained obscure. The genus *Costera*, with one species, *C. ovalifolia*, was described by Dr. J. J. Smith (in Ic. Bogor. 13, 77, t. cccxiv: 1910) with only vague suggestions as to its nearest allies: it was pointed out that the fasciculate inflorescence resembled that of *Diplycosia*; the non-articulate pedicel, that of *Pentapterygium**; and the remaining floral characters (except the deeply divided corolla and isomerous stamens), those of *Vaccinium*. The genus *Iaera* was created by H. F. Copeland (in Philipp. Journ. Sci. 47, 82: 1932) for the reception of three species previously referred to *Vaccinium* or *Diplycosia*: *V. lanaënsis* Merr. (syn. *V. medinilloides* Elmer), *D. lucida* Merr. (syn. *V. costeroïdes* Merr.), and *V. Loheri* Merr. The type species is *Iaera lanaënsis* (Merr.) H. F. Copel. Copeland (l.c. 102) compared the genus with *Costera* and pointed out that the latter is probably the more advanced genus of the two.

The following table may serve to bring out the differences between these three evidently closely related genera. The exceptional characters are italicised.

	COSTERA	IAERA	CYMOTHOË
Petiole-glands	present	present	<i>absent</i>
Leaf-base	rounded	<i>cuneate</i> to rounded	rounded to <i>auriculate</i>
Leaf-apex	rounded to emarginate	<i>acuminate</i> to rounded	rounded to subemarginate
Flower	pentamerous	pentamerous	<i>tetramerous</i>
Calyx-teeth	<i>gland-tipped</i>	no apical gland	no apical gland
Corolla	<i>choripetalous</i> , or almost so	shortly lobed	shortly lobed
Androecium	<i>haplostemonous</i>	diplostemonous	diplostemonous
Anthers	<i>clavate-papillose</i>	minutely papillose	minutely papillose
Ovary	? 4-locular	5-locular	4-locular
Seeds	3-4 per loculus	5 per loculus	<i>about 15 per loculus</i>

* The attribution to *Pentapterygium* of a non-articulate pedicel is erroneous.

As pointed out by Copeland (l.c. 102), in no other Malayan (or indeed Asiatic) genera of *Vaccinioideae* is the ovary continuous with the pedicel. Viewed, therefore, in the light of the Old World genera only, they occupy a very isolated position in the subfamily. But a glance at some of the *Vaccinioideae* of tropical America brings to light a fairly clear affinity. Several genera of New World *Thibaudieae* exhibit the above type of pedicel (see A. C. Smith in Contrib. U.S. Nat. Herb. 28, pt. 2: 1932); whilst the genus *Sphyrropermum* (incl. *Sophoclesia*), excluded from *Thibaudieae* by the same author (in Brittonia 1, 203: 1933), agrees so closely in most essentials with the three Malayan genera under discussion that little doubt of its affinity with the latter can be entertained. The most important characters in common are the following: epiphytic habit; palmate leaf-venation; flowers small, fascicled (peduncle obsolete), 1-2 together, on relatively elongate slender pedicels; pedicel continuous with ovary; pentamery or tetramery (sometimes both in *Sphyrropermum*); haplostemony or diplostemony (sometimes intermediate stages in *Sphyrropermum*); anthers dorsally ecalcarate.

Sphyrropermum differs from the Malayan genera in the following points: filaments longer than anthers; pericarp thinly papyraceous, smooth, brittle; seeds elongate-scoberiform; testa longitudinally striate, not foveolate-reticulate. From this it will be seen that it is almost easier to distinguish the three Malayan genera from each other than from *Sphyrropermum*, at least on technical characters. In general habit the species of the latter genus are much more slender and the leaf-texture much thinner than in the Old World genera. In leaf-shape *Iaera lucida* (Merr.) Copel. is not unlike *Sphyrropermum grandifolium* (Hoer.) A. C. Smith.

The writer is at present unable to agree with A. C. Smith in excluding *Sphyrropermum* from the *Thibaudieae*.* Although its inclusion in this group may render the technical circumscription of the latter more difficult, there are so many points of resemblance between *Sphyrropermum* and the Thibaudiean genera *Themistoclesia* and (especially) *Diogenesia* that to place them in distinct tribes seems to be to obscure an evident affinity.† The species of these three genera are slender or very slender epiphytes, with rather small leaves; small or very small flowers on slender pedicels which

* Copeland's and A. C. Smith's misgivings about the tenability of the *Vaccinieae* and *Thibaudieae* (as at present defined) as natural groups, are, however, fully shared by the present writer.

† The writer readily admits his comparative ignorance, in detail, of the the main bulk of the American *Thibaudieae* and his great indebtedness to the excellent work of the author mentioned on this complex group: the views here expressed are therefore necessarily only tentative and subject to correction. As H. Sleumer has recently pointed out, the results of Niedenzu's anatomical investigations (Engl. Bot. Jahrb. 11, 205 seqq., 211-12: 1890) favour the inclusion of *Diogenesia* (and *Sphyrropermum*) in the *Thibaudieae*: see Notizbl. Bot. Gart. Berl. 12, 121-3 (1934).

are continuous with the calyx-tube (ovary); anthers dorsally ecalcarate; pericarp rather thin or very thin. In addition it may be pointed out that a parallel to the angled calyx of *Themistoclesia* is found in that of *Sphyrospermum Standleyi* A. C. Smith, and that the elongate filaments of *Sphyrospermum* are paralleled by those of *Agapetes* Ser. *Longifiles* Airy-Shaw (vide *K.B.* 1935, p. 25). [If, however, as A. C. Smith has suggested (*Contrib. U.S. Nat. Herb.*, l.c. 316), the Asiatic genera referred to this tribe have had an independent origin from those in America, the second point mentioned has less significance.]

At all events, *Costera*, *Iaera* and *Cymothoë* have apparently no near surviving relatives in the Old World. A few characters of apparent analogy may be indicated: free petals in *Costera* and *Vaccinium dialypetalum* J. J. Smith (type of Sect. *Galeopetalum* J. J. Sm.; cf. H. F. Copeland, *Philipp. Journ. Sci.* l.c. 103); petiolar glands in *Costera*, *Iaera* and *Agapetes* spp.; obsolete peduncles, elongate pedicels and small flowers in all three Malayan genera and in *Agapetes obovata* (Wight) Hook.f. and *A. pilifera* Hook.f. ex C.B. Cl. The solitary-flowered *Vaccinium uniflorum* J. J. Sm. and *V. monanthum* Ridl., known to Copeland (l.c. 83) only from the descriptions, are certainly not related to *Iaera* and its allies, but rather to *Vaccinium lanceolatum* (Bl.) Merr. or to *Rigiolepis*. The Formosan *V. Merrillianum* Hayata (Copeland, l.c.) is closely related to *V. Delavayi* Franch.

The geographical distribution of the genera under discussion does not necessarily militate against the possibility of their close relationship, for parallel instances can be adduced from other Ericaceous genera. For example, the species of *Gaultheria* Series *Dumicola* Airy-Shaw (Hook. Ic. Pl. 33, t. 3207, p. 2: 1933), including the Sumatran *G. abbreviata* J. J. Sm. and *G. atjehensis* J. J. Sm. are much more closely allied to the West Indian *Brossaea coccinea* L. and its allies (now usually referred to *Gaultheria*) than to any other Asiatic representatives of *Gaultheria*. The remarkable Bornean endemic, *Vaccinium cordifolium* Stapf*, appears to be most closely related to certain South American species, e.g. *V. crenulatum* Dunal. Reference has already been made to the resemblance of the foliage of *Cymothoë* to that of *Macleania amplexicaulis* A. C. Smith, *et aff.*, a feature which strengthens the impression that these Malayan plants belong to an essentially American type not otherwise represented in the Old World. For this reason, and on account of the connection between *Iaera*, etc., and *Sphyrospermum*, and (as it seems to me) between *Sphyrospermum* in its turn and *Themistoclesia*, I refer all these genera provisionally to the *Thibaudieae*.

That these plants represent some of the most advanced (and reduced) types within the alliance is evident from their epiphytic

* "Tentatively assigned" by Copeland (l.c. 104) to the *Neojunghuhnia* group, but I think erroneously.

habit, epedunculate and generally 1-flowered inflorescence, small often tetramerous flowers, occasional complete or partial suppression of one whorl of stamens, and occasional reduction in number of seeds. The occurrence of what must be secondary continuity of pedicel and calyx, and, in *Costera*, of secondary choripetaly, are features of unusual interest. From an evolutionary point of view, all these indications point to relative youth. From the point of view of "age and area," also, the restricted geographical distribution of *Iaera* and its allies would suggest a group of comparatively recent origin. But the total absence from the Malayan region of any "wide" (*sensu* Willis) from which these very local types could have arisen confronts us with an anomalous situation.

Whether the Malayan "Iaeroids" originated in America (more or less contemporaneously with *Sphyrospermum*) from a "Thibaudioid" stock and subsequently migrated to Asia, † or whether the presumed "Thibaudioid" progenitors at one time existed in the Malayan region, gave rise to the "Iaeroids" on the spot, and subsequently suffered extinction, is perhaps an insoluble problem, and speculation thereon, though tempting, futile. Their extremely limited distribution suggests that, at the present day, they are not particularly successful members of the general plant-community and indeed, despite considerable specialisation, probably barely holding their own in the struggle for existence.

Some additional facts concerning the genus *Costera* may appropriately find mention here. *C. ovalifolia* occurs on the mainland of Borneo, as is shown by the following specimens in the Kew Herbarium, which agree perfectly with Dr. J. J. Smith's description and plate (Ic. Bogor. l.c. *supra*), except that the leaves are usually definitely emarginate at the apex.

SARAWAK. Without precise locality, Lobb: "Shrub, 6 feet." Garai, 5 miles from Kuching, 21 Apr. 1891, Haviland 817: "Shrub (epiphyte). Flower stalk white."

Both these specimens are in fruit, and on Haviland's there are also a few young flower-buds. From a dissection of one of these, the ovary was apparently 4-locular, as found by Dr. J. J. Smith—a curious condition in an otherwise pentamerous flower. The fruit was too advanced to permit of certainty as to the number of septa. This point requires confirmation from study of better material. The corolla appeared to be completely or almost completely chori-petalous, but its texture in the bud stage was so delicate that, once again, certainty was not possible. I was able, however, to confirm the presence of the curious subclavate papillae on the anthers, described and figured by Dr. Smith. The filaments were almost completely eciliate, as in Smith's fig. 6.

† The terms America and Asia are, of course, here used for the respective land-masses at a time when their configuration or relative position may have been such as to render possible intercommunication between their floras.

Ripe fruit and seeds being hitherto undescribed, a description is supplied herewith (from Lobb's specimen).

Fructus maturus subglobosus, 4 mm. diametro, ut videtur niger, subcarnosus, tandem subexsuccus, pericarpio tenui subcoriaceo. *Semina* in quoque loculo 3-4, pro rata magna, subtrigona, cuneiformia quasi segmenta sphaerae, ventre subrecta, dorso rotundata, 2-2.5 mm. longa, 1-1.25 mm. diametro, pallidiuscule castanea, oculo nudo opaca, testa sub lente pulcherrime reticulato-foveolata, interstitiis vel foveolis valde nitentibus.

KEY TO CYMOTHOË AND ALLIED GENERA OF THIBAUDIEAE.

Corolla 12-16 mm. long; leaves large, cuneate or attenuate at the base; stamens isomorphic.....**Thibaudia** § **Agathothibaudia**

Corolla 2-11 mm. long:

Inflorescence racemose or corymbose (peduncle or rhachis evident); corolla 6-11 mm. long; leaves generally caudate-acuminate, very acute, generally rounded at the base:

Calyx-tube 5-angled or narrowly 5-winged; flowers constantly pentamerous; stamens generally dimorphic; filaments usually glabrous, rarely pilose.....**Themistoclesia**

Calyx-tube terete; flowers pentamerous or tetramerous (stamens sometimes 6); stamens isomorphic; filaments ciliate.....

Diogenesia

Inflorescence fasciculate (peduncle obsolete) or flowers solitary; corolla 2-7 mm. long; stamens isomorphic; leaves generally rounded at apex, less frequently attenuate:

Filaments longer than anthers; pericarp very thinly papyraceous, smooth, brittle; seeds elongate-scoberiform, testa longitudinally striate **Sphyrospermum**

Filaments shorter than anthers; pericarp firmly crustaceous or subcoriaceous; seeds subcuneiform, obtusely angled, testa foveolate-reticulate:

Calyx-teeth not gland-tipped; corolla shortly lobed; androecium diplostemonous; anthers minutely papillose:

Petiole without lateral glands; flowers tetramerous; seeds about 15 per loculus.....**Cymothoë**

Petiole with two conspicuous lateral hydathode-like glands; flowers pentamerous; seed about 5 per loculus.....

Iaera

Calyx-teeth gland-tipped; flowers pentamerous; corolla choripetalous; androecium haplostemonous; anthers clavate-papillose; seeds 3-4 per loculus; petiole with two lateral glands.....**Costera**

XVI—NEW OR LITTLE KNOWN PLANTS FROM SOUTH INDIA: VI *

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N.B. Localities in brackets after the name of the species indicate localities noted in the Flora of the Madras Presidency.

Impatiens dendricola C. E. C. Fischer, sp. nov. [Balsaminaceae]; a *I. laticorne* C. E. C. Fischer foliis tenuioribus longioribus ellipticis basi attenuatis minus hirsutis, alarum lobo inferiore multo longiore recurvato recedit.

A stemless epiphytic herb. Leaves pendulous, thinly membranous, elliptic to ovate-lanceolate, obtuse, minutely apiculate; base rounded or more often attenuate; 1.8-8.2 cm. long, 1-3.7 cm. wide; midrib and 4-5 pairs of nerves slender, the latter ascending at a very acute angle; more or less scattered hairy on the upper face, glabrous below, punctulate; margins rather distantly crenate, apiculate in the sinuses. Petioles slender, terete, 1.5-6.5 cm. long, glabrous. Scapes 2-3, semi-pendulous; peduncles slender, terete, 7-13 cm. long, glabrous. Racemes 1.5-4 cm. long, up to 8-flowered; petioles 1-1.7 cm. long (up to 2 cm. long in fruit); bracts at the base broadly ovate, obtuse, 2.5-3.5 mm. long, glabrous. Flowers white. Posterior sepal oblate, concave, base saccate, 5-5.5 mm. long, 7-7.5 mm. wide, white; lateral sepals falcate-ovate, obtuse, base deeply lobed on the anterior side, 2.5 mm. long, veined. Wings white with a tuft of orange hairs a little above the base, 1.6-1.8 cm. long, 3-lobed, the distal lobe straight, strap-shaped, rounded, 8 mm. long, median lobe sub-circular, 6 mm. diam., basal lobe strap-shaped, slightly widened at the apex, strongly recurved, about as long as the distal. Vexillum subcircular, obtuse, concave, 6-7 mm. long, produced into a strongly curved, bulbosely clavate spur, 1-1.5 cm. long, white. Ovary ellipsoid, 2-2.4 mm. long, glabrous. Capsule semi-ellipsoid, one side straight, acute, 8-9 mm. long. Seeds sausage-shaped 1.2-1.3 mm. long, dark brown, muriculate, with a dense tuft of crinkled hairs up to 2.5 mm. long at each end.

Coorg, on Thadidiandamolu, 4,000 ft., fls. and frt. Sept., *E. Barnes* 886, 887 (typus in Herb. Kew.) "On tree trunks in evergreen forest."

Impatiens Stocksii Hook. f. et T. [Balsaminaceae].

(Bombay Presidency.)

Coorg; at the foot of Thadiandamolu, fls. white with a yellow tuft at the base of the wings, Sept., *E. Barnes* 888; Brahmagiri Hills, Bhagamandala, 3500 ft., *E. Barnes* 889.

Sonerila nemakadensis C. E. C. Fischer, sp. nov. [Melastomaceae]; *S. grandiflorae* Wall. peraffinis, foliis ovatis basi rotundatis transverse nervatis, calycis viridis lobis latioribus, petalis majoribus rotundatis breviter unguiculatis pallidioribus differt.

* Continued from K.B. 1935, 97.

A glabrous herb 10–30 cm. high ; stems succulent, once branched. *Leaves* membranous (firmer when growing in the open) ; ovate to ovate-lanceolate, acute, base rounded, 2.5–5.5 cm. long, 1.2–3 cm. wide ; 5-ribbed from the base, the inner lateral pair continued nearly to the apex, connected by faint, obliquely transverse veins ; minutely pustulate on both faces ; margins sharply, evenly, rather deeply serrate. *Petioles* 0.4–3 cm. long, channelled above. *Flowers* rather large for the genus, in terminal umbels or subumbelled short scorpioid 5–7-flowered racemes. *Peduncles* 2–5 cm. long. *Bracts* minute, setaceous. *Pedicels* 4–6 mm. long (up to 10 mm. in fruit). *Calyx* narrowly funnel-shaped or narrowly urceolate, tapering to the pedicel, 7–10 mm. long ; lobes ovate, acute, 2.5–3 mm. long. *Petals* nearly circular, minutely apiculate, shortly clawed, 1.6–2.3 cm. long, pink-purple. *Stamens* 3, yellow ; filaments 5–7 mm. long ; anthers 6–8 mm. long, finely attenuate, curved. *Style* 1–1.2 cm. long, inclined, pink-purple ; stigma capitate, minutely puberulous. *Capsule* turbinate, 6–8 mm. long. *Seeds* oblong or narrowly obovate, 1 mm. long, pale-brown, smooth, apex narrowly appendaged to form sometimes a narrow wing.

Travancore : High Range, Nemaikad Gap, 6500 ft., fls. and frt. Dec., *E. Barnes* 103.

Prof. Barnes reports that the plants growing in exposed situations are smaller and more succulent, often with ovate-lanceolate leaves, those in shady places being more numerous and have more membranous ovate leaves.

This species also closely resembles *S. speciosa* Zenk., *S. elegans* Hook. f. and *S. Bensoni* Hook. f. From the first it differs by the 5-ribbed leaves, the glabrous petioles, pedicels and calyx and narrower calyx-lobes. From the second by the green and glabrous leaves and petioles, the former with rather deeper and not ciliate teeth, glabrous calyx, circular petals and yellow anthers. It is distinguished from *S. Bensoni* by the smaller, purely green leaves and peduncles, the unribbed, glabrous calyx and 3 instead of 6 stamens.

***Sonerila versicolor* W. var. *axillaris* Gamble** [Melastomaceae].

(W. Nilgiris and Wynaad.)

Coorg : Shola at the foot of Thadiandamol, fls. and frt. Sept., *E. Barnes* 883.

***Sonerila Wallichii* Benn.** [Melastomaceae.]

(W. Ghats from the Wynaad to the Anaimalais.)

Coorg : at the foot of Thadiandamol in wet shola forest, fls. and frt. Sept., *E. Barnes* 911 ; Brahmagiri, 3000–4000 ft., *E. Barnes* 913.

***Epithema carnosum* Benth. var. *pusillum* C. B. Clarke** [Gesneraceae].

(Bombay Presidency.)

Coorg : Jersey Falls near Mercara, on wet rocks, fls. Sept., *E. Barnes* 928.

***Peristylus brachyphyllus* A. Rich.** [Orchidaceae].

(Bababudan and Nilgiri Hills.)

Coorg ; grassy hills near Mercara, fls. Sept., *E. Barnes* 896.

***Peristylus spiralis* A. Rich.** [Orchidaceae].

(Bababudan and Nilgiri Hills.)

Coorg : summit of Brahmagiri, fls. green with yellow lip, Sept., *E. Barnes* 892. "Common on the hills of Coorg ; has an almond smell."

***Cryptocoryne consobrina* Schott.** [Araceae].

(W. Ghats.)

Cochin : Karapara River near Kuriarkurti, fls. Dec., *E. Barnes* 959 ; Perambikulam River, *E. Barnes* 962. A little-collected plant of which there is only one rather poor sheet in the flowering stage in the Kew Herbarium, which has only the emergent and not the submerged leaves. Prof. Barnes's specimens show the latter. The submerged leaves are "up to 2 feet long and very narrow with strongly undulate margins, purplish-green, growing in dense tufts in running water. Inflorescence up to 10 in. long, limb 2 in. long, tube 7 in. long and chamber 1 in. long with a somewhat twisted spathe. Margin of the limb thickened, involute and studded with warty processes ; a raised oval palate in the mouth of the limb, palate with many dark-purple blotches, rest of inner surface with purple warty ridges on a light coloured ground ; near the tip the sides unite to form a long twisted tail. Common, growing in cracks of rocks in river beds with some leaves in running water and some in tufts above water." The marginal warts of the spathe and the colouring are not mentioned in published descriptions, nor are they at all clearly visible in the single sheet referred to above.

***Amorphophallus sylvaticus* Kunth** [Araceae].

(Circars and Nilgiri-Wynaad.)

Chingleput District ; Tambaram near Vandalur, 200 ft., fls. Aug., *E. Barnes* 880.

In three of the specimens the floral part of the spadix overtops the spathe by $\frac{2}{3}$ –1 in. In other specimens seen by me it is either shorter than or just equalling the spathe.

***Eriocaulon Gamblei* C. E. C. Fischer** [Eriocaulaceae].

(Nilgiri Hills.)

Coorg : Brahmagiri, 4,000 ft., fls. Sept., *E. Barnes* 865.

***Cyperus Zollingeri* Steud** [Cyperaceae].

(Palni and Travancore Hills.)

Nilgiri Hills, near Naduvattam, fls. Sept., *E. Barnes* 873.

***Garnotia courtallensis* Thw.** [Gramineae].

Nilgiri, Palni and Travancore Hills.)

Coorg : Mercara, fls. Sept., *E. Barnes* 860.

Tripogon capillatus *Jaub. et Spach.* [Gramineae].

(Mysore, Wynaad, Cochin.)

Coorg: Mercara, fls. Sept., *E. Barnes* 858, "on tree-trunks and roofs of houses."

Tripogon pauperculus *Stapf* [Gramineae].

(Bababudan, Mysore and Travancore Hills.)

Coorg: Brahmagiri, 4,000 ft., fls. Sept., *E. Barnes* 862.

XV.—MISCELLANEOUS NOTES.

New Andine Malvaceae.—Amongst the interesting plants collected by Miss D. B. Stafford on her recent journey in the Peruvian Andes were some acaulescent *Malvaceae*. One of these proved to be an entirely new species of *Nototriche* and another is considered to be a distinct variety of *Malvastrum Bakerianum* A. W. Hill.

Nototriche armeriifolia A. W. Hill, sp. nov., foliis linearibus, vaginis intus dense et longe hirsutis a congeneribus distincta.

Fruticulus depressus, caespitosus, pulvinatus, ad instar *Armeriae vulgaris*; caudex subterraneus, lignosus, firmus, ramosus. *Folia* arcte aggregata, rosulata, linearia, involuta, viridia; petiolus cum vagina 0.8–1 cm. longus; stipulae petiolo adnatae et cum eo quasi vaginam membranaceam formantes, parte libera parva lanceolata acuta circiter 1.5–2 mm. longa uti petiolus facie et marginibus dense hirsuta pilis albidis stellatis 3 mm. longis dense vestita; vagina 3–3.5 mm. lata, dorso glabra; lamina elongata, linearis, 1.5 cm. longa, circiter 1 mm. lata, marginibus incurvis, lobis linearibus brevibus 1 vel 2, rarius 3, circiter 5 mm. infra apicem instructa, lobis circiter 2 mm. longis; lamina supra dense stellato-velutino-hirsuta, subtus glabra. *Flores* petiolo paullo infra medium insidentes. *Calyx* ad medium 5-lobus, 7.5 mm. longus, extra fere glaber, pilis longis sparsis instructus, intus basi nectariis 5 papillosis instructus, lobis triangularibus acutis intus et ad margines pilis longis vestitis. *Corolla* pallide violacea, 1.3–1.4 cm. longa; petala late obovato-cuneata, 4 mm. lata, basi in tubum 4 mm. longum coalita. *Stamina* numerosa, antheris in capitulum globosum dispositis. *Carpella* fere matura 1.75 mm. longa, rostris 0.5–0.75 mm. longis, dorso pilis 3–4 mm. longis vestita.

PERU. Dept. Puno: in a valley running down from the Cunurana range between Santa Rosa de Ayaviri and Sicuani, 1934, *Stafford* 362.

Malvastrum Bakerianum var. *strigosum* A. W. Hill, var. nov., a typo foliis omnino dense strigoso-hirsutis, calycibus extra hirsutis, floribus minoribus praecipue differt.

PERU. Dept. Cuzco: high valley, Urcos, 3,600–4,800 m., May 1932, *Stafford* S. 32; Cuzco, March–April, 1934, *Stafford* 325 (type).

One or two of the specimens collected by Miss Stafford under the number 346 have the outer side of the calyces covered with strigose hairs and the pedicels are also furnished with similar hairs, otherwise they agree fairly closely with typical *M. Bakerianum*.

The following additional localities for *M. Bakerianum* may be recorded: Sicuani Distr., *Stafford* 326. Dept. Puno, grassy meadows and slopes on puna, 3,850–3,900 m., *F. W. Pennell* 13417. Sta. Rosa, 3660–4870 m, *Stafford* S. 30, S. 31, S. 31A, S. 31B.

Pennell's specimen is the only one of these collections which bears mature fruits and as they were not seen when the description was drawn up details are now added:—

Carpella reniformia, 4.5 mm. longa, rostrata, rostris 1 mm. longis, dorso pilis stellatis vestita. *Semina* reniformia 1.5 mm. longa et lata.

The flower colour in *M. Bakerianum* varies from white to lavender and mauve, but in the variety *strigosum* they are tinged with a rosy-red on the outside towards the apex of the petals.

A. W. HILL.

The Britton Herbarium.—We learn, from the "Journal of the New York Botanical Garden," that "in commemoration of the late Dr. N. L. Britton, Director of the New York Botanical Garden from its incipient stages in the last decade of the preceding century until his retirement in June, 1929, at the age of seventy years, the Board of Managers of the Garden, at its annual meeting, held January 14, on motion of Dr. E. D. Merrill, Director, voted that the general herbarium (Phanerogams) of the New York Botanical Garden be henceforth designated as **The Britton Herbarium**, New York Botanical Garden."

The Diseases and Curing of Cacao.*—This book has been written as the outcome of a discussion at the Imperial Mycological Conference in 1929, when the need was stressed for a series of handbooks dealing with the diseases of the major tropical crops. The diseases included are those caused by plant parasites, chiefly fungi.

Chapters 1, 2 and 3 deal with root diseases, stem diseases and pod diseases respectively, while chapter 4 is devoted to the witches' broom disease (caused by *Marasmius perniciosus* Stahel) which is of great importance in South America and Trinidad. In chapter 5 the author has usefully brought together a great deal of scattered literature dealing with the preparation of "curing" of cacao, and has appended references to the papers and books consulted. At

* The diseases and Curing of Cacao. By H. R. Britton-Jones. (Macmillan & Co., Ltd. 1934, pp. x and 161, 37 figs. uncol., price 10/-).

the end of the book is a bibliography of 192 titles of papers and books concerned with the diseases of cacao and their control.

As the work is intended primarily for the use of agricultural officers and planters, detailed technical descriptions of the parasites have in general been omitted. The descriptions of the macroscopic features and the disease symptoms caused, together with good illustrations, should enable those interested to recognise the more important and conspicuous diseases with which they have to deal.

Throughout the work the author has emphasised the influence of agricultural practices and of external conditions in general in relation to the incidence of disease. In speaking of root-diseases, for instance, he stresses the importance of soil conditions and points out that the beneficial effects obtained by trenching may often be due as much to aeration and drainage as to restriction of the parasite. The book is thoroughly practical and admirably suited to the requirements of those for whom it is intended.

Its value is not seriously affected by some confusion evident in chapter I as to the identity of the parasite causing one of the most common root-diseases of Hevea and Cacao in the Old World. Following van Overeem, the fungus is called *Rigidoporus microporus* (Sw.) van Overeem. This is unfortunate for two reasons, firstly because systematic mycologists in general have not accepted the numerous new genera proposed by Murrill in his work on *Polyporaceae*, and secondly because, as Professor Britton-Jones himself mentions, there is some doubt as to whether the West Indian fungus, originally described as *Polyporus microporus* Swartz, is the same species as *Polyporus lignosus* Kl. (= *Fomes lignosus* (Kl.) Bres.) of the Eastern Hemisphere. The discussion on pages 1 and 2 as to the name of this fungus indicates a lack of appreciation by the author that the name *Rigidoporus microporus* (Sw.) van Overeem denotes the same fungus as *Polyporus microporus* Swartz. If *Polyporus microporus* Swartz is not the same species as *P. lignosus* Kl., and the West Indian fungus is definitely less strongly parasitic than *P. lignosus*, then the specific epithet *microporus* of Swartz cannot be used for the cause of the disease under discussion, which according to the author is not known in the Western tropics.

E. M. WAKEFIELD.

Medicinal Plants.*—This volume deals primarily with the early history and uses of medicinal plants. Attention is directed chiefly to plants that occur in this country and Europe but some of the better known medicinal plants of other countries are also discussed. These appear under chapters entitled "Medicinal Plants of India, China and Chaldea," "Egypt and Greece," and "Rome and the Early Christian Era." It is hardly feasible to

* "The Physic Garden, Medicinal Plants and their History," by Edith Grey Wheelwright. Jonathan Cape, London, 1934. Pp. x+228, 18 illustrations. Price 10s. 6d. net.

separate a study of the medicinal plants of early races from a study of their medicine and the author has acted wisely in not attempting this. The discussions relating to early medicine and the strange practices then in vogue undoubtedly add interest to the book and should appeal more especially to the general reader.

With regard to medicinal plants in Britain, their uses are discussed from "the Anglo-Saxon period to the British Pharmacopoeia" and a separate chapter contains notes on all the more important species that are regarded as of value in medicine or to the herbalist at the present time. These are arranged according to families. Many facts of special interest are included in the discussion of the drug trade and the cultivation of drug plants in this country and on the Continent. The account given of the changes that took place in drug plant production during the Great War and cessation of supplies from Germany forms an interesting record.

The inclusion of jaborandi (*Pilocarpus microphyllus*) among Chinese medicinal plants is an unfortunate error. It is also to be regretted that the use of authorities with specific names is inconsistent and that a comma is used after the latter. The number of misprints is rather large and there are several erroneous statements. For example, *Pulicaria dysenterica* is stated (p. 177) to be uncommon, *Erythraea Centaurium* (an annual) is said (p. 179) to "branch out into shrubby plants", and it is stated (p. 165) that *Cochlearia officinalis* is "not considered indigenous."

In compiling the volume the author has undoubtedly made an extensive study of the wide range of literature that exists on this subject and has not failed to realise its magnitude when, in her introductory remarks, she makes the modest claim that "it is no more than a student's excursion into certain aspects of the subject."

F. N. HOWES.

Plant Hunting in Alaska.*—The manifold delights of this narrative of Miss Hutchison's recent journey in Alaska will immediately strike every reader; in a scientific periodical these can merely be recorded, together with a strong recommendation to all lovers of travel and adventure to read this charming volume, illustrated by photographs and by reproductions of watercolours by the author.

There are two appendices, one giving a descriptive list of the native curios presented to the Cambridge University Museum of Ethnology, the other comprising an enumeration of the plants collected for the Kew Herbarium. The latter gives particulars of locality and habitat, and in some cases the local names and uses of the plants. Two hundred and twenty-eight species are listed. An account of the

* "North to the Rime-Ringed Sun," by Isobel W. Hutchison. Blackie and Son, Ltd., 1934. Pp. ix+262, 20 plates. Price 12s. 6d.

botanical aspect of Miss Hutchison's journey has already appeared in this journal (K.B. 1934, 345).

Miss Hutchison's book forms a striking record of personal courage and endurance and is a great tribute to the fine character of the men who helped her on her way. It is gratifying to know that the rigours and perils so graphically described have resulted in such a comprehensive and useful collection from a botanically little-explored part of the world.

The Genus *Hemerocallis*.*—Dr. Stout states in the preface that he has based this work largely upon a personal study of the extensive living collection of the genus in the New York Botanical Garden. In chapter 5 we read "For several of the species, all the plants studied at the time of naming were of a single clone which may not be typical or even very representative of the wild members of the species. An extensive critical study has not been made of the Daylilies of the orient. No doubt various valid species remain to be discovered and named." It is therefore to the horticulturist, rather than the botanist, that the book will be of most use. There is a concise key to the thirteen species recognised by the author and a large number of clonal varieties are enumerated in an alphabetical list occupying no less than 40 pages in chapter 6, but the absence of a key to these clones will be regretted by the systematist. The uses of daylilies are dealt with in detail. The great importance of members of this genus as herbaceous perennials will be known to all gardeners but fewer people are acquainted with the employment of the flowers as an article of food. For this purpose *Hemerocallis fulva* and other species have long been cultivated on an extensive scale in China and the dried flowers sold under the name "gum-jum." The culture and care of the plants is dealt with fully by the author and there is much valuable information on the methods of propagation. The statement is made that "few Daylilies reproduce true to type by seed." The value of the book is much enhanced by thirty-six plates of excellent illustrations, a bibliography as an appendix, and a very full index.

C. V. B. MARQUAND.

* Daylilies; the Wild Species and Garden Clones, both Old and New, of the Genus *Hemerocallis*, by A. B. Stout, Ph.D. The Macmillan Co., New York, 1934. Pp. 119. Price 12s. 6d. net.

BULLETIN OF MISCELLANEOUS INFORMATION No. 4 1935 ROYAL BOTANIC GARDENS, KEW

XV.—THE STRUCTURE OF SOME SANDALWOODS AND THEIR SUBSTITUTES AND OF SOME OTHER LITTLE KNOWN SCENTED WOODS. C. R. METCALFE.

This account may be regarded as a continuation of a previous paper (17) on the structure of some scented woods from the East. Some additional information has been obtained concerning the structure of the wood of *Cinnamosma fragrans*, which was described in the last paper, as well as of the closely related genus *Warburgia*, and the description of the former given in the previous article needs to be slightly modified in order that the woods of the two genera may be distinguished.

The sandal- and other woods here described are dealt with primarily according to their country of origin. At the present time the chief sources of true sandalwoods, by which are meant oil- and scent-yielding woods belonging to the *Santalaceae*, are India and Australia, whilst some are obtained from Polynesia and New Caledonia (19). Of these, it is generally agreed that East Indian sandalwood, which is the product of *Santalum album*, is the most superior both in the quality of the wood and yield of oil. Australian sandalwood is largely the product of *Eucarya spicata* Sprague et Summerhayes, although other members of the *Santalaceae* have also been used. In India the quite distinct woods *Erythroxylum monogynum* Roxb. and *Ximenia americana* Willd. are sometimes used as substitutes, and *Eremophila Mitchelli* Benth. (*Myoporaceae*) is the source of a bastard sandalwood in Australia. Descriptions of these have therefore been included.

The so-called West Indian or Venezuelan sandalwood of commerce, the oil of which is said to be very inferior to that of *Santalum album*, is believed to be the product of *Amyris balsamifera* L. (*Rutaceae*), the wood structure of which is here described. The botanical source of the sandalwoods of East Africa and Madagascar is somewhat obscure, but it seems evident from the information and specimens collected together during the present investigation that, although there is evidence that the wood of some member or members of the *Santalaceae* may be employed, a proportion is provided by the quite unrelated genus *Brachylaena* of the family *Compositae*. In addition scented woods are obtained from *Cinnamosma fragrans* Bail. and *Warburgia* spp. (*Canellaceae*).

Although they are not commonly known as sandalwoods, brief accounts of the scented woods of *Convolvulus scoparius* (Canary

rosewood) from Teneriffe, and *Urandra* sp. (daru-daru or dedaru) from Singapore have been included.

As is usual when dealing with woods that have been used commercially from ancient times, great difficulty has been experienced in obtaining accurately named specimens. Apart from specimens in the Kew museums, samples of a few of the woods accompanied by herbarium material from the same source have been obtained direct from Australia. Some specimens have been obtained from the collections at the Imperial Forestry Institute, Oxford, and the Forest Products Research Laboratory, Princes Risborough. In addition a large number of specimens were supplied by Prof. S. J. Record from the collections at Yale University, the identity of some of which had been previously authenticated by a study of the corresponding herbarium material. It has thus been possible to make anatomical comparisons of material from a wide range of sources, and to eliminate a number of erroneously named specimens. Where there has been lack of agreement in minor respects amongst different apparently reliable specimens of any particular species, this has been indicated in the text.

The technical terms used in describing the woods are for the most part those which have been defined in the "Glossary of Terms used in Describing Woods" (35) which has recently been compiled by a special committee of the "International Association of Wood Anatomists."

TRUE SANDALWOODS FROM VARIOUS SPECIES OF SANTALACEAE FROM INDIA, AUSTRALIA, AND ISLANDS IN THE PACIFIC.

Sawyer, writing of santal wood in 1892 (3) quotes the following remarks of Dr. Berthold Seeman: "the trade in this fragrant wood has been going on since the dawn of history, and will probably not cease until the connection between santal trees and idolators, existing from time immemorial, shall have been broken up, by either the one or the other becoming as extinct a race as the Archaeopteryx or the Dodo." It is not, therefore, surprising that a great deal should have been written concerning this wood, and it may be a matter for wonder that there is still more to be said concerning it. Nevertheless, an analysis of the literature reveals that it for the most part consists of oft-repeated statements taken from a limited number of original papers written by those with a first hand knowledge of the wood. Probably the most complete early account of the botanical origin of sandalwood was written by E. M. Holmes (10). He gives a list of species of *Santalum* then believed to be the source of various local sandalwoods. The chief of these is *Santalum album*, whilst the remainder are mostly confined to small islands ranging from the Malayan region and Australian coast across the Pacific ocean. Even at the time when Holmes's paper was written it was believed that many of these local sandalwoods were already exterminated owing to rapid exploitation, and

it is stated that substitutes began to come into use for this reason. For instance one reads that owing to the rapid destruction of *S. freycinetianum* Gaud. in the Sandwich islands in 1849 "an attempt was subsequently made to sell the scented wood of *Myoporum sandwicense* A. Gray, in order to revive the trade, but it did not succeed."

At the present time the main source of true sandalwood is still *Santalum album*, which is cultivated in India largely in the region of Mysore. Writing in 1932, Pearson and Brown (19) state that the total production of sandalwood in India may be put at 3,000 tons per annum.

The botanical identity of the trees yielding Australian Sandalwood has been a matter of controversy, (16, 20, 34) but following the reinvestigation of the taxonomy and nomenclature of the family by Sprague and Summerhayes (33) it has become usual to refer to the principal sources as *Eucarya spicata* Sprague et Summerhayes (syn. *Fusanus spicatus* R. Br.) and *E. acuminata* Sprague et Summerhayes (syn. *Fusanus acuminatus* R. Br.). According to Holmes (10) *Exocarpus latifolius* R.Br. yields a little oil less fragrant than that of *S. album*. According to Penfold (20) *Eucarya spicata* yields an oil of very high quality, more especially in recent years when more attention has been paid to selecting suitable wood and to the technique of extraction. Penfold quotes H. V. Marr as having stated that the sandalwood industry of West Australia dates back to 1846 when 4 tons of wood were exported. Of recent years the trade has increased considerably. In 1921, 6800 lbs. of oil were produced, and since then there has been a steady increase, as much as 100,000 lbs. having been produced in 1930. Large quantities of the oil are stated to be exported to America for use in the soap industry. Penfold also mentions that oil is also extracted in Western Australia from *Santalum lanceolatum* R.Br. This oil has been used to a limited extent in order to increase the laevo-rotation of the oil derived from *Eucarya spicata* although its use for this purpose has now been discontinued.

In spite of their having been exploited commercially for so long, there is very little reliable information concerning the wood structure of the different kinds of sandalwood derived from the *Santalaceae*. Petersen (23), working at the University of Strasbourg, carried out an anatomical investigation of various sandalwoods including amongst others *Santalum album*, *S. Yasi* Seem. and *Fusanus acuminatus* R.Br., some of the material having been supplied from Kew. Unfortunately it is quite clear from Petersen's figures and description that the material of *Fusanus acuminatus* R.Br. on which he worked and which came from Kew was really quite a different wood. Moreover, one of the figures illustrating the structure of *Fusanus acuminatus* has been copied in at least one text-book (9). (There is still a specimen in the Kew museum which, until now, has been labelled "*Fusanus acuminatus* R.Br. Paris exhibition 1867.")

The structure of this erroneously named specimen agrees closely with the one figured and described by Petersen. It seems that this specimen may have been the cause of the mistake).

A reliable and complete anatomical description of the wood of *Santalum album* is given by Pearson and Brown (19). Some of the measurements, however, given in this description are not sufficiently wide in range, probably because the description was based on only one specimen.

In the present investigation the structure of the following *Santalaceae* has been examined: *Santalum album*, East Indian sandalwood, *S. freycinetianum* Gaud., Hawaiian sandalwood, *S. austro-caledonicum* Vieill., New Caledonian sandalwood, *S. Yasi* Seem., Fiji sandalwood, *Eucarya spicata* and *E. acuminata* Sprague et Summerhayes, which yield Australian sandalwood, and *Exocarpus latifolius* R.Br., also from Australia.

Santalum album (Figs. 1 & 2).

MACROSCOPIC CHARACTERS.

Pale brown sap-wood sharply differentiated from the darker but yellowish-brown heart wood. However, since only the heart-wood is strongly scented, most commercial specimens consist only of the heart-wood. *Growth rings* clearly defined in some specimens but less so in others, consisting of zones with relatively crowded pores of large diameter alternating with zones with comparatively few pores of small diameter. *Pores* very small, mostly solitary. *Parenchyma* clearly visible only with the microscope. *Rays* very fine, crowded, not easily visible with a lens.

MICROSCOPIC CHARACTERS.

Vessels.—Diameter of solitary vessels; radial 20–104 (mostly 48–90) μ , tangential 20–76 (mostly 36–68) μ , average diameters varying considerably in different specimens. 27–61 solitary vessels per sq. mm., almost exclusively solitary but occasionally 2 or even 3 together, disposed radially or tangentially. Some contiguous to rays on one side only, very rarely on both sides. Vessel elements 150–380 μ long (mostly 200–300) μ , end walls horizontal or oblique, perforations simple. A few vessels in all specimens plugged with deposits, but the number thus filled varying considerably in different specimens. Pits between vessels and fibres numerous, bordered. Vessel-ray pits rather small, oval to elliptical, horizontally disposed, half-bordered, orifice of larger pits sometimes extending beyond the margin of the pit. *Fibres*.—Groundwork of the wood composed of libriform fibres, not arranged in definite radial rows, somewhat angular, 16–20 μ diameter. Individual fibres up to 1,300 μ long. Wall of fibres always thick, but in some specimens very much thicker than in others. Radial and tangential walls with numerous

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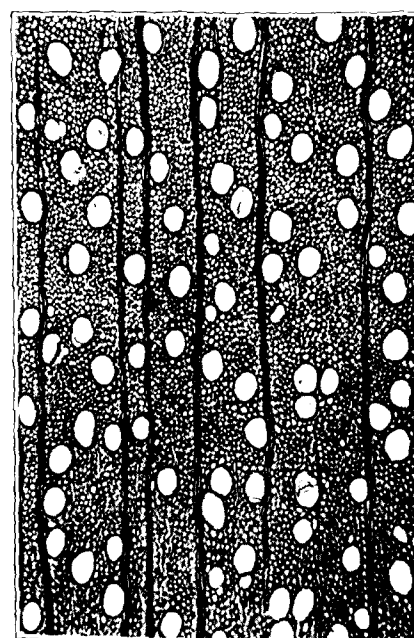


FIG. 1. *Santalum album*.
Transverse section, $\times 28$.



FIG. 2. *Santalum album*.
Tangential section, $\times 57$.



FIG. 3. *Santalum austro-caledonicum*.
Tangential section, $\times 57$.



FIG. 4. *Santalum Freycinetianum*.
Tangential section, $\times 57$.

[To face page 168]

conspicuous bordered pits. *Parenchyma* abundant, chiefly metatracheal, consisting of solitary cells, or chains or groups of 2-5 cells. Diameter of individual metatracheal parenchyma cells 12-28 (mostly remarkably uniform at 16-20 μ). *Parenchyma* chains extending in a radial, tangential, or oblique direction. Paratracheal parenchyma consisting of isolated cells or a few together. Vessels never actually surrounded by parenchyma, but always with some fibres contiguous to them. *Parenchyma* cells sometimes, but rather infrequently, divided into loculi each of which contains a large solitary crystal, individual chains consisting usually of 2-5 crystals but sometimes as many as 19. *Rays* very fine, 6-10 per mm., uniseriate and biseriate, very rarely partly triseriate (Yale 13659), 1-34 (mostly 10-18) cells high, heterogeneous. Upright cells almost exclusively at margins, usually in one row but sometimes more. *Rays* mostly 160-360 μ high (maximum 580 μ) and 8-36 (mostly 16-30) μ wide. Individual cells 12-48 μ high, most with brown oily contents.

Material examined :—(1) Kew 67-1929. (2) Yale 19468, 19836, 13659. (3) Imperial Forestry Institute 603. (4) Gamble's 321, and D.3999, and Gamble no number. (In Kew museums). (Two of the above specimens i.e. 67-1929 and Gamble no number, had rays which were rather shorter than appears to be normal for *Santalum album*. However the remaining 6 specimens examined all conformed to the above description, and it seems probable that this represents the normal structure of *S. album* from India).

No reliable macroscopic characters have been found whereby it is possible to distinguish the wood of *Santalum album* from the various local sandalwoods belonging to the same genus. Nor do the microscopical differences between the genera *Santalum* and *Eucarya*, as represented by the species here described, appear to be more clearly defined than those existing between the various species within the genus *Santalum*. In fact the wood structure of all the *Santalaceae* examined is remarkably similar. Microscopical differences in structure, however, do exist, and these are generally sufficient for a reasonably accurate identification of any commercial specimen of the two genera. It is comparatively easy to identify *S. album* itself on account of its taller rays, and the structure of *Eucarya spicata* cannot readily be confused with that of *S. album*. Since these two species yield most of the sandalwood of commerce this distinction is an important one. If, however, the source of a given sandalwood is known its identification is considerably simplified.

Table I (p. 170) shows the more important measurable characters by which the species may be distinguished. Since the microscopic structure is so similar, no detailed descriptions of the individual species have been drawn up, thus avoiding repetition. Brief notes on the most useful diagnostic characters are given, and it is thought that these, taken in conjunction with the table and illustrations, will be the best guide for identification. The most useful

Species.	Vessels per sq. mm.	Radial vessels diameters.	Tangential vessel diameters.	Rays per mm.	No. of cells in ray height.	Height of rays in μ .	Width of rays in μ .	Height of ray cells in μ .	Diameter of metatracheal parenchyma cells.
<i>Santalum album</i>	27-61	20-104 μ mostly 48-90	20-76 μ mostly 36-68	6-10	1-34 mostly 10-18	mostly 160-360 maximum 580	8-36 mostly 16-30	12-48	12-28 μ
" <i>freycinetianum</i>	23-55	24-120 μ mostly 40-88	28-100 μ mostly 40-80	6-10	1-27 mostly 6-16	mostly 100-250 maximum 400	16-40 mostly 20-36	12-40 mostly 20-30	12-40 μ mostly 16-32
" <i>austro-caledonicum</i>	33-76	24-104 μ mostly 40-80	30-84 μ mostly 40-70	3-9	1-16 mostly 5-11	mostly 100-200 maximum 260	12-28 mostly 20	12-24 v. rarely 40	12-24 μ
" <i>Yasi</i>	37-43	28-112 μ mostly 40-90	40-80 μ mostly 50-80	7-10	1-13 mostly 6-13	mostly 80-180 maximum 196	16-28	12-40 mostly 12-20	16-32 μ rarely exceeding 24
<i>Eucarya spicata</i>	48-95	48-88 μ mostly 60-80	40-68 μ mostly 40-60	5-8	1-20 mostly 6-13	mostly 100-230 maximum 280	16-36 mostly 16-28	8-64 mostly 12-24	12-28 μ mostly 16-24
" <i>acuminata</i> (1 spec.)	22-31	72-100 μ mostly 76-100	60-88 μ mostly 64-80	5-8	1-14 mostly 5-10	mostly 100-200 maximum 232	mostly 20-28	12-44 mostly 16-24	12-24 μ mostly about 16
<i>Exocarpus latifolius</i>	26-66	68-112 μ mostly 80-100	60-92 μ mostly 60-80	3-11	1-16 mostly 7-9	mostly 80-180 maximum 320	12-28 mostly 12-20	12-36 mostly 12-36	12-32 μ mostly 16-24

Table I.—In the above table the low figures given in each case do not represent the smallest observed, but the smallest that were at all frequent.

single character by which the species of *Santalum* may be distinguished is the height of the rays. Reference to table I shows that the species *S. album*, *S. freycinetianum*, *S. austro-caledonicum* and *S. Yasi* form a series in this order with progressively shorter rays. However, the ray height in the Australian Eucaryas and *Exocarpus latifolius* rather overlaps with that of some of the species of *Santalum*, so that it is not possible to place all the *Santalaceae* investigated in a regular order on the basis of this character alone.

The only other outstanding features of diagnostic value are:—

(1) that in most specimens of *Santalum freycinetianum* there are narrow, practically continuous, concentric zones of (terminal) parenchyma: these were not observed in any specimen in any other species: (2) that in *Eucarya spicata* the vessels are much more frequently in groups than in any other of the *Santalaceae* examined: Moreover, the obliquely arranged groups (transverse section) often consist of three, four, or more rarely, five vessels.

***S. austro-caledonicum* Vieill.** New Caledonian Sandalwood. (Fig. 3).

Growth rings often more clearly defined than in the other *Santalaceae* except *Eucarya spicata*; boundaries marked by comparatively broad zones with very few vessels of small diameter. *Fibres* rather wider than in most species, 20-24 μ diameter. Two rows of bordered pits frequently visible in the width of a fibre (longitudinal section). *Metatracheal parenchyma* in most specimens tending to be in comparatively long tangential or oblique rows, sometimes consisting of as many as 8 or more cells. (This was not true of Yale 13991). *Rays* 1-16 (mostly 5-11) cells high. Actual height of rays mostly 100-200 (maximum 260) μ . Individual ray cells 12-24 (very rarely 40) μ high. *Crystals* in chains of 3-15 (in some specimens as many as 24). Crystal rows occasionally partly biseriate. Crystal-containing cells 12-40 (mostly 2-28) μ high.

Material examined:—(1) Kew 1930. (2) Yale 13991, 14249, 14316.

***Santalum freycinetianum* Gaud.** Hawaiian Sandalwood. (Fig. 4).

Vessels.—Radial diameter 24-120 (mostly 40-88) μ , tangential diameter 28-100 (mostly 40-80) μ . *Fibres*.—Lumen of fibres wide compared with *S. album*, and, as in *S. austro-caledonicum*, two rows of bordered pits frequently visible in the width of a fibre (longitudinal section). *Parenchyma*.—Most specimens clearly differentiated from other species of *Santalum* by the presence of more or less continuous concentric bands of (terminal) parenchyma (not observed in one specimen). *Rays* 1-27 (mostly 6-16) cells high. Height mostly 100-250 (maximum 400) μ . *Crystals* in chains of 2-26, but number very variable in different specimens. Crystal-containing cells 24-44 (mostly 30-40) μ high.

Material examined:—(1) Kew 29-1891. (2) Yale 1903, 1904, 21221. (3) Authentic material from Hawaii, received 1934.

Santalum Yasi Seem. Fiji Sandalwood. (Fig. 5).

Vessels.—Radial diameter 28–112 (mostly 40–90) μ ; tangential diameter 40–80 (mostly 50–80) μ . *Fibres* with narrow lumen as in *S. album*, or sometimes even narrower. Usually only one row of bordered pits visible in the width of a fibre (longitudinal section). *Parenchyma*.—Diameter of metatracheal parenchyma cells 16–32 (rarely exceeding 24) μ . *Rays* very short, 1–13 (mostly 6–13) cells high; height 80–180 (maximum 196) μ . *Crystals* usually in chains of 3–9.

Material examined: (1) Kew 1879. (2) Imperial Forestry Institute 2913.

Eucarya spicata Sprague et Summerhayes. Australian Sandalwood. (Fig. 6).

Growth rings well defined, especially in comparatively small branches. In older wood marked by narrow concentric bands in which the fibres are arranged in radial rows. *Vessels*.—48–95 per sq. mm., in some specimens more frequent than in any other of the *Santalaceae* examined; more frequently in pairs or groups than in any species of *Santalum*. Obliquely arranged pairs very frequent, and sometimes present in oblique groups of 3, 4, or more rarely 5. Tangential and radial pairs fairly frequent. Radial groups of three occasional. Vessel walls often flattened where in contact with one another. *Fibres* short, with 1 or 2 rows of bordered pits in the width of a fibre (longitudinal section). Pitting similar to that in *Santalum freycinetianum*. *Rays* 1–20 (mostly 6–13) cells high, mostly 100–230 (maximum 280) μ high. Ray cells sometimes 64 μ high (taller than in any other of the *Santalaceae* examined), but mostly included in the range 12–24 μ high. *Crystals* in chains of 2–10 (seldom more than 7). Crystal-containing cells larger than in any of the other *Santalaceae*, 24–80 μ high.

Material examined:—(1) Kew 130–1885. (2) Woods and Forests, specimen received in 1933.

Eucarya acuminata Sprague et Summerhayes. South Australian Sandalwood.

Vessels. Radial diameter 72–100 (mostly 76–100) μ ; tangential diameter 60–88 (mostly 64–80) μ ; 22–31 per sq. mm. (Less frequent than in any of the other *Santalaceae* examined. It is, however, questionable whether much reliance should be placed on this character since only one authentic specimen was examined); rarely in pairs. *Fibres* with similar structure and pitting to *E. spicata*. *Rays* 1–14 (mostly 5–10) cells high; height 100–200 (maximum 232) μ . *Crystals* in rather infrequent chains of 3–6. Crystal-containing cells 24–60 (mostly 24–44) μ high.

Material examined:—(1) Kew 1863. (2) Forestry Commission N.S. Wales, specimen received in 1933.

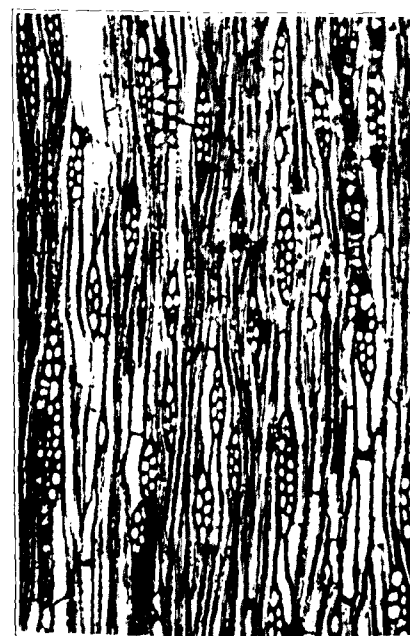


FIG. 5. *Santalum Yasi*.
Tangential section. 57.

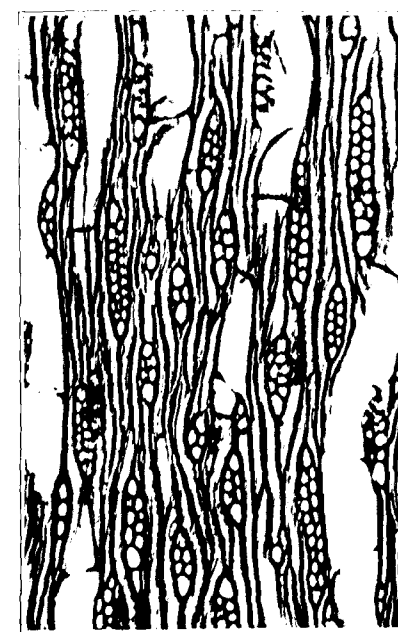


FIG. 6. *Eucarya spicata*.
Tangential section. 57.

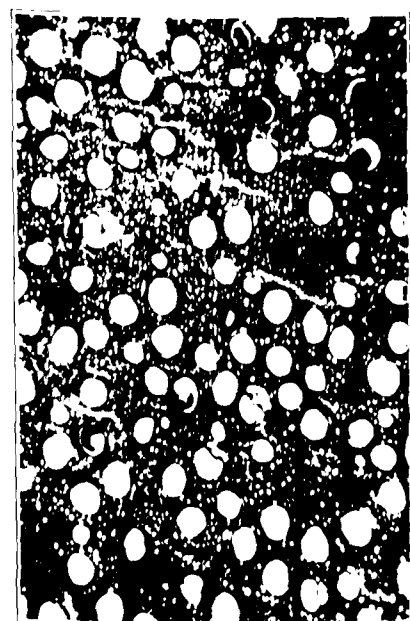


FIG. 7. *Eucarpus latifolius*.
Transverse section. 28.



FIG. 8. *Conocarpus scoparius*.
Transverse section. 28.

Exocarpus latifolius R.Br. (Fig. 7).

Although no reliable macroscopical method of distinguishing the individual species of *Santalum* and *Eucarya* has been found, the general appearance of the wood of *Exocarpus latifolius* is rather more distinct. In the one large specimen available there was no clear differentiation into heart and sap wood. The wood was darker in colour than is usual in *Santalum* and *Eucarya*, and the yellowness characteristic of the true sandalwoods was absent. Rather infrequent, narrow, concentric lines (transverse surface) of wood very much darker in colour than the remainder. These appeared as dark streaks on longitudinal surfaces. *Vessels*.—Radial diameter 68–112 (mostly 80–100) μ ; tangential diameter 60–92 (mostly 60–80) μ ; almost exclusively solitary, rarely in tangential or oblique pairs. *Fibres* with very thick walls, lumen in some almost obliterated, walls thicker than those of the two species of *Eucarya* examined. *Metatracheal parenchyma* cells abundant, thin-walled, many filled with densely staining contents, standing out in marked contrast to the groundwork of thick-walled fibres. *Rays* 1–16 (mostly 7–9) cells high; height mostly 80–180 (maximum 320) μ . *Crystals* usually present in chains of 3–17, but somewhat variable in individual specimens. Crystal-containing cells 16–40 (mostly 20–32) μ high.

Material examined:—(1) Kew 1862. (2) Yale 5314.

AQUEOUS AND ALCOHOLIC EXTRACTS OF SANTALUM, EUCARYA AND EXOCARPUS.

Aqueous and alcoholic extracts of these woods are usually almost colourless or slightly lemon coloured, whilst others are reddish brown. If dilute ammonia (10 per cent. of .880) be added to any of them the colour is invariably intensified. These colour reactions can to some extent be used as confirmatory identification tests, although it would be very unwise to rely on these tests alone, as the results obtained are not always consistent. The colours most usually obtained on adding ammonia to extracts of the woods are as follows:—

S. album—reddish brown or pale ale coloured. Sometimes slightly fluorescent.

S. freycinetianum—colour as in *S. album* but frequently more intense. Slightly fluorescent.

S. Yasi and *S. austro-caledonicum*—Pale lemon coloured, sometimes with a faint green tinge.

Eucarya spicata, *E. acuminata*, and *Exocarpus latifolius*—Similar to *S. Yasi* and *S. caledonicum*, but in every instance in which tests were made, the colour was more intense, having the appearance of clear lemonade.

SUBSTITUTES FOR TRUE SANDALWOODS.

Eremophila Mitchelli Benth. (*Myoporaceae*). Budda or Bastard Australian Sandalwood. (Figs. 9 and 10).

In the paper by Holmes to which reference has already been made (10), it is stated that *Eremophila Mitchelli* is the source of a sandalwood from Queensland. Recently the oil derived from this tree (known vernacularly as budda wood, bastard sandalwood, or budtha) has been examined by Bradfield, Penfold and Simonsen (3). The oil is stated to be rather dark, and although unsuitable to replace sandalwood oil for all purposes, it is said to have "remarkable qualities which place its value in line with those of fixative balsams. It has not a strong odour, but is soft with a suggestion of geranium to bergamot backing."

On the labels on some specimens of this wood kindly supplied from the Technological Museum at Sydney by Mr. Penfold, the following particulars of the wood and tree are given: "a pale yellowish-brown, close textured, rather greasy, aromatic timber with lighter coloured streaks running through it. The medullary rays are very small and numerous, the growth rings giving the timber figure. Although hard, it is an easy timber to work, and polishes well. Suitable for small cabinet work and panelling, veneers, turnery, fancy boxes, brush backs and similar ornamental purposes. A medium sized tree of 50-60 feet, fairly plentiful in some localities, found in the interior of Queensland, New South Wales, and S. Australia. Weight about 68 lbs. per cubic foot."

The following is an account of the microscopical characters of the wood based on two specimens, one of which was accompanied by the corresponding herbarium material, obtained from the Technological Museum at Sydney. Later on a similar authentic specimen was received from the Forestry Commission, N.S. Wales.

MICROSCOPICAL CHARACTERS.

Growth rings numerous, fairly well defined, boundaries marked by narrow concentric zones in which the vessels with relatively small diameters tend to be in smaller irregular clusters and less frequently in radial chains than elsewhere. A large proportion of the vessels in these zones filled with contents or tyloses. (In sap wood vessels without contents and tyloses). *Vessels* almost all in irregularly shaped groups or clusters; scarcely any solitary ones observed. Shape of the groups or clusters in different parts even of a single specimen very variable. In some parts of most specimens vessels predominantly in long radial rows, sometimes consisting of as many as 36 contiguous vessels. 20-40 (mostly 25-36) vessel groups per sq. mm. In many instances the individual groups not clearly defined owing to coalescence of adjacent groups. Vessel groups frequently contiguous to rays on at least one side. Solitary vessels so infrequent that none were measured. Radial diameter of individual vessels in groups 28-80 (mostly 40-70) μ ; tangential diameter 28-80 (mostly 40-60) μ , but in sap wood tangential diameter

most frequently 60-80 μ . Vessel elements 140-260 μ long, end walls nearly all horizontal, perforations simple. Intervascular pits minute, crowded, sometimes coalescing, chiefly in approximately horizontal rows. Vessel-ray pits most easily seen in sap wood, (obscure in heart wood owing to the presence of deposits), where visible apparently similar to intervacular pits. *Fibres*.—Ground-work of wood composed of very thick-walled, irregularly arranged fibres, shape variable in transverse section, 0.45-0.85 mm. long; ends usually tapering to a fine point, lumen widest in the middle of the fibres. Pits few, not very clearly visible, apparently simple. *Parenchyma* chiefly paratracheal, mostly consisting of a few isolated cells around the vessels, but never entirely surrounding them; especially well developed in association with the irregular shaped vessel groups, in some instances occupying all the space between small groups of vessels which together form a larger aggregate of vessels. (In order to make this clearer it may be mentioned that some of the irregular shaped groups of vessels are in a sense compound since they consist of 2 or 3 smaller groups which are almost contiguous, but separated from one another only by a single layer of parenchyma cells). Most parenchyma cells usually filled with densely staining contents (except in the sap wood). *Rays* 8-15 per mm. very variable in structure, many wholly uniseriate, some partly or wholly bi- or tri-seriate, others bi- or tri-seriate at the centre (tangential section) but with long uniseriate margins on one or both sides. Heterogeneous, marginal and uniseriate portions of rays usually consisting of upright cells. Rays 1-23 (mostly 3-20) cells high; height very variable even in different parts of a single specimen, but majority included in the range 150-450 (maximum observed 725) μ ; width 12-40 μ ; ray cells 16-40 μ high, 8-32 μ wide, mostly filled with densely staining contents. (In sap wood contents less frequent, and where present, not staining so deeply). Large solitary crystals of various shapes present in some of the ray cells.

Material examined:—(1) Technological museum Sydney. Two specimens received in 1934. (2) Forestry Commission N.S. Wales. Specimen received in 1934.

Ximenia americana Willd. (Olacaceae). (Fig. 11).

According to several authorities the wood of this tree is used in India as a substitute for that of *Santalum album* (7, 18, 29). The Brahmins, especially, use it in their religious ceremonies. According to Record (l.c.) *X. americana* is the best known and most widely distributed member of its genus. It sometimes grows to a tree 30 feet high, but it is more often a shrub, occurring in tropical- and sub-tropical regions throughout the world. It is known sometimes in S. America as "false sandalwood" or "yellow sanders."

In general appearance and structure the wood of this species has many points in common with that of the *Santalaceae*. This will be made clear if the following description is compared with that of *Santalum album*.

MACROSCOPIC CHARACTERS.

Wood yellow to light brown. Most of the specimens too small to determine whether heart and sap wood are well differentiated, but in specimen Kew 79-1886 the comparatively narrow sapwood was clearly differentiated from the darker coloured heart wood. Pores small, usually evenly distributed, solitary. Growth rings not very clear in some specimens, but clearer in others, boundaries marked by a few smaller vessels. (In specimen 79-1886 collected by J. S. Gamble, growth rings more clearly defined, wide concentric bands with relatively infrequent vessels being present). Rays very fine, crowded, visible with lens.

MICROSCOPIC CHARACTERS.

Vessels nearly all solitary but sometimes in radial, tangential or oblique pairs, occasional tangential groups of four. Radial diameter of solitary vessels 40-120 (mostly 60-100) μ ; tangential diameter 32-88 (mostly 40-80) μ . For the most part evenly distributed, except for boundaries of growth rings (and in the zones of varying frequency in specimen (79-1886). 19-53 solitary vessels per sq. mm., but relatively constant throughout a single specimen. Vessels elements short, 160-400 (mostly 200-300) μ long, end walls mostly horizontal, perforations simple. Deposits and tyloses abundant in specimen 79-1886, tyloses common and deposits scarce in Yale 20509, and both deposits and tyloses scarce in Imperial Forestry Institute 2392. Vessel-ray pits half bordered, somewhat elongated, up to about 16 μ wide in broadest diameter. Fibres lumen widest in the middle, ends tapering. Length 0.7-1.4 mm., thick-walled. Pits rather large and fairly numerous, bordered. Parenchyma.—Very little present, chiefly metatracheal, consisting of single isolated cells scattered amongst the fibres, but sometimes 2 or 3 cells together in oblique or radial rows (transverse section). Most parenchyma cells filled with deposits. A few, usually isolated, paratracheal parenchyma cells also present. Rays 9-14 per mm. Uni- or bi-seriate, very rarely partly tri-seriate. 1-19 (mostly 5-8) cells high. The rays in Yale 20509 mostly higher than those in Gamble's specimen 79-1886. Heterogeneous. Uniseriate rays nearly always consisting entirely of upright cells, whilst the broader rays consist chiefly of procumbent cells with upright ones intermixed. Tall cells more frequent in Yale 20509 than in Gamble 79-1886. Solitary crystals sometimes present in the ray cells. Most ray cells with contents, 9-52 μ high.

Material examined:—(1) Kew 79-1886. (2) Imperial Forestry Institute 2392. (3) Yale 20509, 20514.

EXTRACTS.

Aqueous and alcoholic extracts very faint yellowish brown or almost colourless. Scent when boiled in water, faint, peppery; not very distinctive.

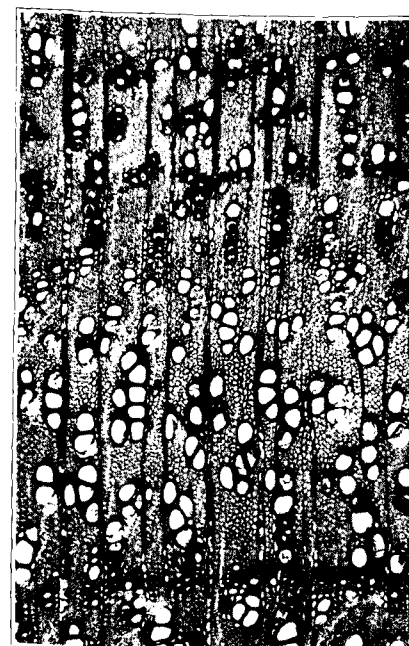


FIG. 9. *Eremophila Mitchellii*.
Transverse section. $\times 28$.



FIG. 10. *Eremophila Mitchellii*.
Tangential section. $\times 57$.

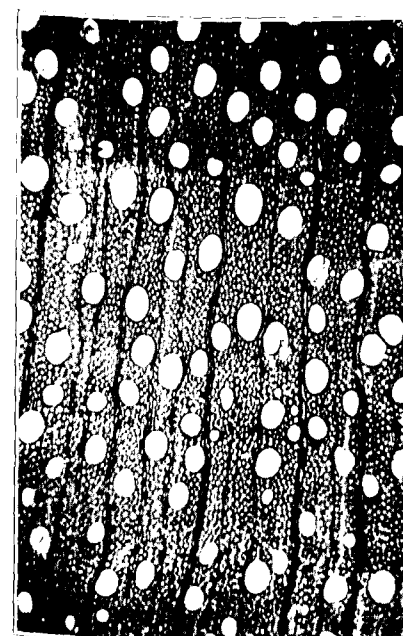


FIG. 11. *Ximenia americana*.
Transverse section. $\times 28$.

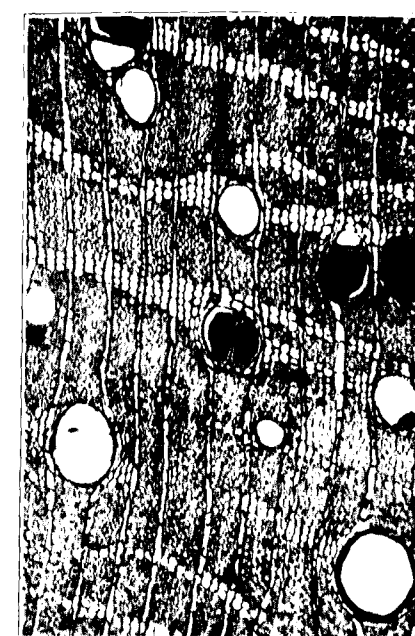


FIG. 12. *Pterocarpus santalinus*.
Transverse section. $\times 28$.

The similarity in the wood structure of *Ximenia* and *Santalum* is of taxonomic interest. *Ximenia*, of the family *Olacaceae*, was placed by Bentham and Hooker (1), together with the *Ilicineae*, in the *Olacales*, which were regarded as being widely separated from the *Santalaceae*. Engler and Gilg (6) on the other hand classify the *Olacaceae* together with the *Loranthaceae* and *Santalaceae* in the same order, the *Santalales*. Hutchinson (12) differs from Engler and Gilg in placing the *Olacaceae* and *Santalaceae* in the separate orders, *Olacales* and *Santalales* respectively, but he regards many of the *Santalales* as reduced parasitic forms of the closely related *Olacales*. The similarity of the wood structure of *Ximenia americana* and *Santalum album*, supports the classification of Engler and Hutchinson, rather than that of Bentham and Hooker.

Comparison of the wood of *Ximenia americana* with that of *Santalum album* shows that the former can be distinguished most easily by the following characters of the medullary rays :—

1. The rays are shorter.
2. The broader rays are more markedly heterogeneous, and the upright cells are fairly frequent in the middle of the rays as well as at the margins.
3. The frequent occurrence of uniseriate rays composed only of upright cells.
4. The vessel-ray pits are frequently much larger and less numerous.

Erythroxylum monogynum Roxb. (*Erythroxylaceae*).

In a letter from H. SenGupta (31) it is stated that this wood is used as a substitute for *Santalum album* especially in South India where it often grows in the same habitat. It is used especially to adulterate sandal paste. A detailed description of the anatomy of this species has not been made owing to lack of authentic material. Moreover such reliable specimens as were available differed from one another in certain minor respects, which indicated that all the specimens may not belong to the same species. However, the specimens agreed in structure sufficiently to make it probable that they at least belonged to the same genus. The main anatomical features which were common to these specimens, and by means of which they may readily be distinguished from the other species described in this paper, are as follows :—

MACROSCOPIC CHARACTERS.

In general the macroscopic appearance of the wood agrees with the brief description given by Gamble (8). The wood is very hard ; the heart and sap wood are clearly differentiated, the former being dark reddish brown, and the latter very pale brown. The specimens did not emit any scent, but this may have been due to their having been stored for some years. Gamble, l.c., describes the wood as having a pleasant resinous smell. Pores very small, but individually distinct with a lens, numerous, often in radial groups (more clearly seen with the microscope). Rays very fine, crowded, but usually clearly visible with a lens.

MICROSCOPICAL CHARACTERS.

Growth rings not very obvious in most specimens, but where present (especially in Imp. For. Inst. 237) boundaries marked by tangential bands of rather large fibres, very definitely rectangular, many with lumen considerably broader than those elsewhere; in some instances accompanied by a single, more or less regular, tangential row of solitary vessels. *Vessels*.—Diameter of solitary vessels variable in different specimens, mostly 60–90 (maximum 116) μ radial and 50–80 (maximum 100) μ tangential; solitary (especially in Kew 1878) or in radial groups of as many as 8, but usually less than this number; infrequently in irregular clusters. Individual vessels of a chain with flattened walls where in contact with one another, 26–52 vessels or groups per sq. mm. In specimens with the higher numbers per sq. mm. the proportion of solitary vessels much greater. Perforations simple, end walls horizontal or slightly oblique. Intervascular pits minute, bordered, very numerous but not crowded. Pits in some specimens circular with circular apertures, but in others horizontally oval with slit-like apertures. Deposits in vessels fairly frequent. *Fibres*.—Groundwork of wood composed of libriform fibres, mostly in radial rows, but locally becoming irregular. Some fibres rounded in cross section, but others angular, but always markedly rectangular at boundaries of growth rings where these are present. Pits rather variable in different specimens. *Parenchyma*.—Paratracheal parenchyma fairly frequent, consisting of a few cells, isolated or contiguous to one another, adjoining but never completely surrounding the vessels. Metatracheal parenchyma abundant, consisting of solitary cells, or short chains which extend in various directions amongst the fibres, sometimes connecting adjacent vessels or vessel groups. Length and frequency of the chains varying in different specimens. Frequent vertical columns of parenchyma cells (up to 32 cells high), each containing a solitary crystal. Nearly all parenchyma cells filled with contents. *Rays* characteristic of the specimens taken as a whole, but varying somewhat in the individual specimens. In Yale 3816 and Imperial Forestry Institute 237 mostly biseriate, in Kew 1878 mostly triseriate, but in all specimens frequently provided with long, uniseriate, tail-like endings. Wholly uniseriate rays also observed. Markedly heterogeneous, up to 24 (mostly 12–20) cells high, but sometimes appearing taller on account of the fusion of 2 rays.

Material examined.—(1) Kew 1878. (2) Yale 3816. (3) Imperial Forestry Institute 237.

EXTRACTS.

Aqueous extracts almost colourless, but with faint reddish-brown tinge, turning yellowish on adding ammonia. Alcoholic extracts even less coloured than aqueous ones.

***Pterocarpus santalinus* Linn. f. (*Leguminosae*).** Red Sanders Wood. (Fig. 12).

The wood of *Pterocarpus santalinus* has sometimes been referred to as red sandalwood, but it may at once be distinguished from the true sandalwoods by the dark red heartwood which was at one time much employed as the source of a dye. Large quantities were shipped from Madras to Europe, but it is now used in this way only to a limited extent.

According to Gamble (8) *Pterocarpus santalinus* is a small or moderate sized tree. Wood extremely hard; sapwood white, heartwood dark claret-red to almost black, but always with a deep red tinge, orange-red when fresh cut.

MACROSCOPIC CHARACTERS.

Growth rings.—None clearly defined in the specimens examined. *Vessels* individually distinct with a lens. Rather irregularly distributed, mostly solitary, embedded in narrow tangential bands of parenchyma, very often with contents (sometimes white). Vessel lines appearing as distinct scratches, darker in colour than the surrounding wood on account of the dark coloured contents. *Parenchyma* abundant, chiefly as sinuous, concentric lines, somewhat lighter in colour than the surrounding wood, extending from (and in some places connecting) the vessels. Extending tangentially from other vessels only for short distances. *Rays* very fine, and crowded, only just visible with a lens on transverse and tangential surfaces, somewhat more obvious on radial surfaces. *Ripple Marks* distinct in some specimens.

MICROSCOPIC CHARACTERS.

Growth rings not distinct, although in a few instances concentric zones of relatively thick-walled fibres contiguous to relatively thin-walled ones. Terminal parenchyma sometimes present. *Vessels*.—Radial diameter 88–280 (mostly 100–220) μ ; tangential diameter 84–200 μ rather irregularly distributed, 2–9 (mostly 3–5) vessels or vessel groups per sq. mm. Vessels mostly solitary or in radial groups of 2–3; sometimes obliquely arranged, and rarely in irregular clusters of up to 9 vessels; frequently filled with deposits. Vessel elements very short, 150–310 μ long, end walls mostly horizontal, with simple perforations. Intervascular pits mostly in horizontal rows, circular or oval, crowded; aperture elongate-oval or slit-like, with long axis horizontal, vested, extending almost to the outside of the borders. Vessel-parenchyma and vessel-ray pits half-bordered. *Fibres*.—Groundwork of wood composed of libriform fibres, 550–1,100 (mostly 700–1,000) μ long, with tapering ends; lumen narrow (except in some fibres which were very broad in the middle), mostly filled with contents. Pits very infrequent, simple, circular-oval. Fibres tending to be in radial rows, but not regularly

so. *Parenchyma* abundant, chiefly paratracheal, but with tangential extensions, which in some places connect separate vessels or vessel groups. Tangential extensions very short in some instances (aliform parenchyma). Concentric parenchyma bands in some places independent of the vessels, 1-4 (or occasionally more) cells wide. Cells abundantly pitted, storied, mostly in pairs with gabled ends, 100-112 μ long, radial diameter mostly 20-30 μ . Some cells divided into chambers, each containing a solitary crystal. A few isolated chains of parenchyma cells also present amongst the fibres, each cell in most instances containing a single large crystal. A few narrow bands of terminal parenchyma present. Rays 6-11 per mm., often deviating to pass round a vessel; mostly uniseriate, but also partly or wholly bi- or tri-seriate. Biseriate rays more frequent in some specimens than in others. Storied, up to 9 (mostly 6-7) cells high; Rays 108-136 μ high, but sometimes exceeding this. Tallest ray observed 180 μ high. Cells mostly 20-24 μ broad and 20-32 μ high.

Material examined :—(1) Imperial Forestry Institute 4655. (2) Yale 3855. (3) Kew 1928.

EXTRACTS.

Aqueous extracts of shavings of the heartwood are yellowish in colour, and a red scum forms on the surface of the liquid. If dilute ammonia is added to an aqueous extract the liquid turns yellowish-brown and fluoresces blue-green. If dilute hydrochloric acid is added the liquid tends to become discoloured. An alcoholic extract is yellowish-red even when cold, but, if warmed, it becomes a characteristic, intense deep red colour. If shavings are boiled in water an extremely pleasant smell, very similar to that of *Warburgia* and *Cinnamosma*, is emitted.

Adenanthera pavonina L. (*Leguminosae*).

The wood of this species, which is used chiefly for house building and cabinet making, has been included in the present paper on account of the statement of Watt (36) that it is sometimes used as the source of a dye, and also as a substitute for true red sandalwood (*Pterocarpus santalinus*). It is also known as red-wood or coral-wood. Watt also states (37) that the vernacular name rakta-chandan, which truly refers to *Pterocarpus santalinus*, is sometimes erroneously applied to *Adenanthera pavonina*. During the present investigation aqueous and alcoholic extracts of shavings of 3 samples of *A. pavonina* wood were prepared and found to be almost colourless or at most very pale brown. This serves as a ready means whereby it may be distinguished from *P. santalinus*. Whether *A. pavonina* is at present used as a substitute for *P. santalinus* on any considerable scale has not been definitely determined. Mr. C. E. C. Fischer tells me that although familiar with districts in India in which *P. santalinus* is grown, he has never heard that *A. pavonina*, (which

he has seen only in cultivation), is used as a substitute in this way. He suggests, however, that *A. pavonina* may be used as a substitute in other districts where it is more plentiful and where *P. santalinus* is not readily available.

A long detailed account of the wood structure of *A. microsperma* is given by Janssonius (13). The structure of *A. pavonina*, which is stated by Janssonius to be very similar to that of *A. microsperma*, is also given but more briefly. The different specimens available for examination during the present investigation varied somewhat, and since herbarium material corresponding to the wood specimens was not available it was not possible to check their identities. However, it seems probable that all the specimens were closely related if not identical, and the following description embraces the characters of all of them.

MACROSCOPIC CHARACTERS.

Different samples of wood varying considerably in colour and texture. Colour ranging from dark brown (almost black) to light brown, reddish, or yellowish brown. Rays scarcely perceptible with the naked eye. Pores distinct, solitary, or in short radial chains, mostly evenly distributed, but some specimens with tangential bands with very few vessels in them. Pores sometimes plugged with white or dark coloured contents. All vessels surrounded by clearly defined parenchyma, lighter in colour than the groundwork of the wood. *Growth rings* present, but more clearly defined in some specimens than in others. *Parenchyma* extending tangentially for short distances from some of the pores, and rarely in continuous tangential bands (terminal parenchyma).

MICROSCOPIC CHARACTERS.

Vessels solitary or in groups, those in groups usually radially arranged; 2-6 (mostly 3-4) vessels or groups per sq. mm. Vessel groups consisting of 3-14 individual vessels, but varying considerably in different specimens. (In Kew 67-1929 only 2-5 in a group). Radial diameter of solitary vessels 170-300 μ , tangential diameter 120-200 μ . Individual vessels of groups smaller than the solitary ones 50-200 μ radial and 80-200 μ tangential diameter. Perforations simple, end walls horizontal or oblique. Vessel elements varying in length in different specimens, ranging from 160-600 μ . Inter-vascular pits bordered with slit-like apertures, sometimes compound. Vessel-parenchyma and vessel-ray pits of the same type, difficult to see in some instances owing to the presence of a brown substance partly or wholly plugging the vessels. *Parenchyma*.—Para- and metatracheal parenchyma present. (Terminal parenchyma in 13-1924). Paratracheal parenchyma several layers thick, completely surrounding the solitary vessels or vessel groups. Sometimes extending tangentially for short distances. Usually only one vessel or vessel group included within a single mass of paratracheal parenchyma, but in a few instances separate vessel groups united by

paratracheal parenchyma. A large proportion of paratracheal parenchyma cells usually filled with deposits (especially in heart wood). Radial diameter 20–32 μ , tangential diameter 20–64 μ . Length 80–180 μ . Metatracheal parenchyma cells often with contents, usually slightly smaller than the paratracheal ones. *Fibres*.—Groundwork of wood composed of libriform fibres in radial rows, and provided with minute pits. Mostly polygonal, with thick walls and circular or elliptical lumen, 12–28 μ diameter, lumen up to 12 μ . Some fibres replaced by longitudinal series of crystal containing cells, each cell containing a single crystal, 8–36 in a single series, but the lengths of the series varying in different specimens. Some chains of crystal cells rarely biseriate for a short distance. Walls usually thin, cells cubical, but in some specimens with thicker walls especially in heartwood. In some instances attached to the margins of the rays. Cells at the ends of the rows often smaller than those in the middle, or, on the other hand, individual rows composed of small or large cells throughout. *Rays* 4–9 per mm., uniseriate or partly or wholly biseriate, very rarely triseriate, 2–20 (mostly 6–16) cells high; homogeneous. Cells 16–40 μ high, nearly all with contents, but in some specimens contents scarce.

Material examined:—(1) Kew 67–1929. (2) Imperial Forestry Institute 1996. (3) Yale 880.

(Kew 13–1924, sent from Singapore by Mr. Burkill, differs somewhat from the above, but most notably in having concentric (terminal) parenchyma).

EXTRACTS.

Aqueous and alcoholic extracts almost colourless or very pale brown. No distinctive scent given off when boiled.

Amyris Balsamifera L. (*Rutaceae*). West Indian Sandalwood. (Figs. 13 and 14).

In 1886 E. M. Holmes (10) writing on sandalwoods, stated that he believed only two were then in use commercially. These were the woods of true sandalwood (*Santalum album*) and Venezuelan sandalwood. The identity of this last was uncertain, but having obtained incomplete herbarium material from the tree yielding the oil, Holmes suggested that it might belong to the *Rutaceae*. Shortly afterwards Kirby (15), working with material supplied by Holmes, made an anatomical investigation of the leaf structure, and, on rather insufficient evidence, concluded, like Holmes, that the tree might belong to that family. By 1899 Holmes (11) had obtained herbarium specimens that were more complete and described the plant as a new species of *Rutaceae* under the name *Schimmelia oleifera*. According to a later article (26) portions of Holmes' specimens were examined at Berlin by Urban who recognised it as being identical with *Amyris balsamifera* L. which by German botanists was referred to the *Rutaceae*. The fact of its being identical

with *A. balsamifera* was overlooked by Holmes (who was then working at Kew) because the genus *Amyris* was placed by Bentham and Hooker in the "Genera Plantarum" amongst the *Burseraceae*. During the present investigation Dr. Sprague pointed out to me that the genus *Amyris* has been placed by Engler (5) in the *Rutaceae-Toddalieceae*, next *Teclea*. In Dr. Sprague's opinion, Engler's verdict may be accepted. Further, as will be shown later on, the wood structure of *Amyris balsamifera*, in at least one important particular, agrees with the *Rutaceae* rather than with the *Burseraceae*. An early illustrated account of the wood structure was given by Petersen (23), though at that time its botanical identity was unknown.

In 1914 a note was published (28) stating that the oil derived from *A. balsamifera* had then recently been used as a substitute for and in order to adulterate the oil of *Santalum album*.

Record (29) writing in 1924, describes *A. balsamifera* as a tree 20–40 or more feet high, common in the West Indies and extending through northern S. America to Ecuador. It is exploited commercially chiefly in Venezuela, where it is usually known as "quigua." It is also known locally as "amyris legitimo" in order to distinguish it from *A. simplicifolia* Karst., and *A. sylvatica* Jacq., which are known as "candil di playa" and "candil di montana" respectively. Before 1914 it was exported chiefly to Germany for the extraction of West Indian sandalwood oil, and in smaller quantities to New York. Record also gives brief notes on the appearance and microscopical structure of the wood, which agree well with the features observed in the specimens examined during the present investigation.

MACROSCOPIC CHARACTERS.

Wood yellow or yellowish-brown. Sapwood narrow, but in the one specimen large enough to show this character, not very sharply demarcated from the heartwood. Close grained, heavy. With pleasant characteristic smell. *Growth rings* distinct, boundaries marked by narrow, concentric bands of (terminal) parenchyma. *Rays* scarcely visible with a lens. *Pores* minute, fairly uniformly distributed; chiefly in short radial chains.

MICROSCOPIC CHARACTERS.

Growth rings distinct, varying in width, boundaries marked by very distinct concentric zones of thick-walled parenchyma, but vessels more or less uniformly distributed. *Vessels*.—A few solitary, but mostly in radial groups of 2–11, very rarely in tangential groups or clusters. 15–35 vessels or vessel groups per sq. mm. Radial diameter of solitary vessels 20–80 (mostly 48–66) μ ; tangential diameter 20–56 μ . Radial diameter of individual vessels from amongst those in groups 32–80 μ , tangential diameter 32–64 μ . Vessel elements 20–400 (mostly 200–325) μ long. Perforations simple, end walls horizontal or less frequently oblique. Deposits

common in vessels, but the frequency varying in different specimens. Intervascular pits bordered, crowded, small, rounded, with slit-shaped openings, chiefly in horizontal rows of 3 or 4. Occasional compound pits. Vessel-ray pits mostly bordered and half bordered, but rather difficult to see in some instances. *Parenchyma* chiefly present as terminal bands forming boundaries between the growth rings. Paratracheal *parenchyma* cells few. Vertical chains of 6-25 crystal-containing cells scattered throughout the wood, replacing the libriform fibres of which the groundwork of the wood is mainly composed, cells 20-60 (mostly 20-30) μ high. Terminal *parenchyma* cells thick-walled, mostly angular but sometimes rounded, usually in bands of 1-3 cells, but width varying in different parts of each band. *Fibres*.—Ground tissue of wood composed of libriform fibres, mostly with very thick walls; rounded as seen in cross section, arranged in radial rows, about 12-16 μ wide and about 450-650 μ long. With very minute simple pits. *Rays* 10-14 per mm., very small, almost exclusively uniseriate, but a few partly biseriate, 1-18 (mostly 6-12) cells high; homogeneous; cells with rather thick walls, 8-16 (mostly about 12) μ high, 4-16 (mostly 6-10) μ broad, the narrower cells usually towards the margins of the rays. Vessel-ray pits small, mostly bordered or half-bordered.

Material examined:—(1) Kew 48-1899. (2) Yale 743.

EXTRACTS.

Aqueous and alcoholic extracts almost colourless. When shavings were boiled a faint smell, somewhat resembling Cinnamon, sometimes given off.

As was stated above this anatomical structure supports the suggestion that *A. balsamifera* has affinities with the *Rutaceae* rather than the *Burseraceae*. Thus Solereder (32) states that the vessels in the wood of the *Burseraceae* which are in contact with the ray *parenchyma*, "bear large simple pits with transitions to bordered pits. The large simple pits, groups of which frequently recall a scalariform perforation of a vessel, form an excellent character of the axis of the *Burseraceae*." In *A. balsamifera*, however, these large simple pits were not observed. On the contrary the small-bordered or half-bordered pits in this position agree rather with Solereder's (l.c. p. 179) statement that "in all the *Rutaceae*, with the exception of *Skimmia* and *Orixa*, the walls of the vessels bear bordered pits where they are in contact with the wood- or ray-*parenchyma* cells."

SANDALWOODS FROM E. AFRICA AND MADAGASCAR.

The botanical source of sandalwood oils of East African origin appears for many years to have been uncertain. In the "Pharmaceutical Journal" for 1898 (25) it states that "Stuhlmann and Volkens have discovered in East Africa a tree-like shrub, *Osyris tenuifolia* Engl., belonging to the natural order *Santalaceae*. The

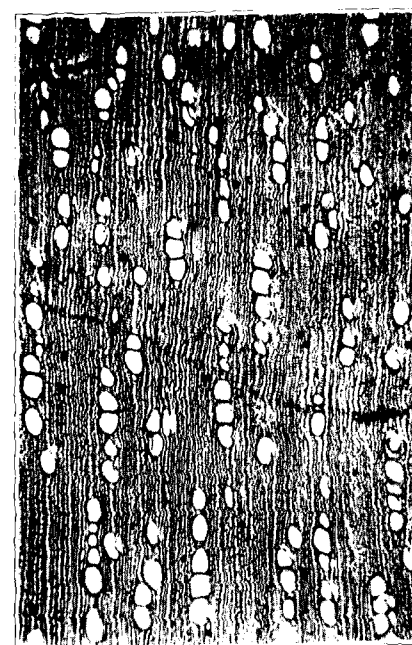


FIG. 13. *Amyris balsamifera*.
Transverse section. $\times 28$.



FIG. 14. *Amyris balsamifera*.
Tangential section. $\times 57$.

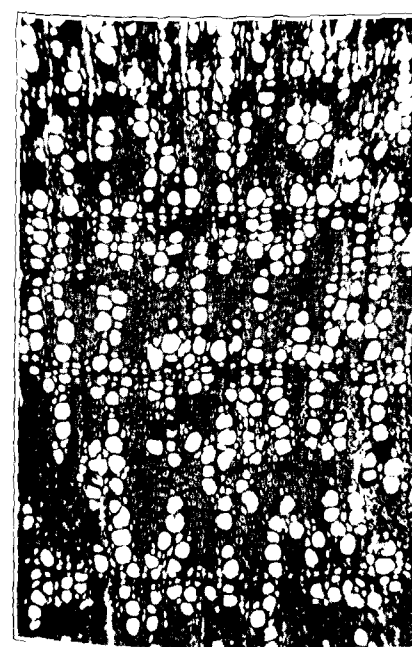


FIG. 15. *Brachylaena Hutchinsii*.
Transverse section. $\times 28$.



FIG. 16. *Brachylaena Hutchinsii*.
Tangential section. $\times 57$.

agreeable smell is due to a brown resin with which the wood vessels are filled ; this originates in the cells of the medullary rays and the wood-parenchyma." No description of the wood is given beyond stating that it is very similar to genuine Indian sandalwood, and since no specimen of wood with this name has been available its identity must remain uncertain. Even as recently as 1932 there is evidence (21) that the identity of E. African sandalwood is uncertain as is shown by the following extract : " A circular issued from a government quarter in U.S.A. states that a concern in India has reported through the assistant trade commissioner at Calcutta to the Department of Commerce that one of its clients has obtained exclusive privilege for the exploitation of sandalwood in a large area in British East Africa. Amongst the varieties the exploiter is interested in supplying is a redwood, in lumps of 6-7 lbs. each, said to be rich in oil. The Indian concern says it has developed trade with several foreign countries. The botanical identity of the sandalwood is not disclosed . . . "

The information collected during the present investigation shows that sandalwood oil of East African origin is derived largely from members of the *Canellaceae*, and from the genus *Brachylaena* (*Compositae*). Sandalwood may also be obtained in this part of the world from members of the *Santalaceae*, but the exact botanical source must remain uncertain until reliable specimens of the wood accompanied by herbarium material are available.

SCENTED WOODS FROM E. AFRICA AND MADAGASCAR BELONGING TO THE CANELLACEAE.

In my previous article on scented woods (17) an account was given of the structure and uses of *Cinnamosma fragrans* Bail., a scented wood from Madagascar belonging to the *Canellaceae*. Further wood specimens of the *Canellaceae* have now come to hand, and the ones on which the description of *Cinnamosma fragrans* was based have been re-examined. This has led to the conclusion that certain of the specimens then believed to be *Cinnamosma fragrans* really belong to the closely related genus *Warburgia*. The wood structure of *Warburgia* spp. and *Cinnamosma fragrans* is in essentials very similar, and the description of the wood structure given under *C. fragrans* is inaccurate only in that it is sufficiently comprehensive to include also the wood of *Warburgia* spp.

Before enumerating the differences between these woods some additional information concerning their uses will be given. The three species of *Warburgia*, *Warburgia Stuhlmanni* Engl., *W. Breyeri* Pot. and *W. Ugandensis* Sprague, all occur on the mainland of E. Africa, while *Cinnamosma fragrans* and the closely related *C. Madagascariensis* Danguy are confined to Madagascar. A record of the commercial use of the bark of *Warburgia Stuhlmanni* is given in the " Pharmaceutical Journal " for 1911 (27), where it is stated that the bark of the " karumbusi " tree (*Warburgia Stuhlmanni*

Engl.) is an article of commerce in Zanzibar, where it is used in the same way as sandalwood. It was believed that the oil from this bark may have been used to adulterate E. African sandalwood oil (thought to be distilled from *Osyris* sp.). It is interesting to note the statement that the bark of *Warburgia* has been an article of commerce at Zanzibar, which is also reputed to be the centre from which the *Cinnamosma fragrans* of Madagascar is exported to India (17). It is thus clear that there is opportunity at Zanzibar for the products of these closely related genera to become confused.

A hot aqueous infusion of the wood of *Warburgia* spp. was found to have the same pleasant distinctive smell and yellowish-green colour and fluorescence as *C. fragrans*. Previous work on the anatomy of the leaf and stem based on herbarium material of *W. ugandensis* was carried out by Boodle (2). The anatomical features mentioned by Boodle agree with those seen during the present investigation. Moreover, Boodle mentions that the anatomy of the material he examined agreed well with that of American *Canellaceae* as given by Solereder (32).

The following are characters whereby the wood of the two genera can be distinguished.

Vessels.—In *Warburgia* spp. vessels more frequently in tangential or oblique pairs (transverse section) than in *C. fragrans*. **Fibres.**—Fibres of *Warburgia* spp. differ from those of *C. fragrans*. 1. In being less frequently in radial rows. 2. In being less rectangular in transverse section. 3. In having a wider lumen. **Parenchyma.**—In *C. fragrans* most vessels partly or wholly surrounded by paratracheal parenchyma. In *Warburgia* spp. paratracheal parenchyma cells relatively scarce, many vessels wholly or almost entirely surrounded by fibres. **Rays.**—In *C. fragrans* rays almost exclusively uniseriate, with a few partly biseriate. In *Warburgia* spp. most rays partly or wholly biseriate, rarely partly triseriate.

Material examined:—*Cinnamosma fragrans* (1) Yale 7367. (2) Vohilahitra from Madagascar. Kew 122-1891. *Warburgia Stuhlmanni*. Imperial Forestry Institute 864. *Warburgia ugandensis*. Specimen from unknown source, until recently used for class purposes at Cambridge University School of Forestry, kindly supplied by Mr. B. A. Jay. *Warburgia* spp (1) Calambac from the market at Kalantan. 1931. (2) Santal Vert. Zanzibar. A very old specimen with no date received from the University of Louvain.

(If the above list of material is compared with the one given under *C. fragrans* in my previous paper on scented woods, it will be seen which specimens have now been transferred from *C. fragrans* to *Warburgia* sp.).

EXTRACTS.

Aqueous and alcoholic extracts yellowish-green and slightly fluorescent, rather yellower than those of *Cinnamosma fragrans*. If shavings are boiled a pleasant smell is given off.

SANDALWOODS FROM E. AFRICA AND MADAGASCAR DERIVED FROM THE GENUS *BRACHYLAENA* (COMPOSITAE).

In 1932 a sample of an unusual sandalwood, which was alleged to have come from India, was received at Kew. After some difficulty it was identified as *Brachylaena* sp. very similar to *B. Hutchinsii*. In a note by H. Perrier de la Bathie (22) it is stated that three kinds of sandalwood are exported from Madagascar to India where they are used for religious ceremonies. Two of these sandalwoods are referred to two species of *Santalina*, whilst the third is a species of *Brachylaena*. It is chiefly the stumps and old dead wood that are used in this way. According to Dr. Hutchinson the systematic position of the genus is near *Baccharis* and *Tarchonanthus*. These genera are represented by trees which are mostly dioecious and are very advanced members of the *Compositae*. Moreover he says that the wood of *Brachylaena* is a well-known sandalwood in E. Africa.

A description of the wood structure of *Brachylaena Hutchinsii* is here included, together with brief notes on other species.

Brachylaena Hutchinsii Hutchinson. (Figs. 15 and 16).

MACROSCOPIC CHARACTERS.

Wood hard and comparatively heavy. Material insufficient to determine whether heart and sapwood differ markedly from one another. All specimens examined dark buff coloured, but the darkness varying. On transverse surfaces roughly concentric stripes of darker and lighter coloured wood present, ranging from dark brown through light brown to yellowish-brown. **Growth rings** distinct on transverse surfaces, boundaries marked by narrow bands comparatively free from vessels. **Pores** small, individual openings visible only with difficulty under a lens, very numerous, chiefly disposed in radial groups, more or less evenly distributed throughout the wood. "Islands" of very thick-walled fibres, darker in colour than the surrounding tissues, also present. **Parenchyma** scarce, chiefly associated with the vessels. **Rays** fine, just visible with a lens on transverse surfaces. **Ripple marks** moderately distinct.

MICROSCOPIC CHARACTERS.

Growth rings distinct, boundaries marked by narrow concentric bands of thick-walled elements strongly rectangular in cross section, and by vessels of smaller diameter than those elsewhere. **Vessels** storied, chiefly arranged in radial rows, in some instances the rows being adjacent to one another, or overlapping. Sometimes also in clusters. Individual groups coalesced or in frequent contact with each other, thereby making it almost impossible to count the number of vessel groups per sq. mm. Only the number of individual vessels per sq. mm. was therefore counted. These numbered 143-286 per sq. mm., the number varying in different specimens but more or less constant for any individual specimen. More or less

evenly distributed, but somewhat less frequent at the boundaries between the growth rings, and also where "islands" of libriform fibres (see below) were most abundant. Radial diameter of individual vessels 16–60 (mostly 28–40) μ , tangential diameter 20–60 (mostly 28–40) μ . Vessel elements remarkably uniform in length, 150–350 (mostly 250–300) μ , end walls mostly horizontal or slightly oblique, perforations simple. Intervascular pits minute, bordered, circular, with circular or slightly flattened apertures. Tracheids present amongst the vessels, distinguishable from the vessel elements only by the possession of non-perforated end walls. Vessel-ray pits bordered or half-bordered. Deposits present in a few vessels. *Fibres* in "islands" of varying and irregular shapes as seen in transverse section, occupying very varying proportions of the bulk of the wood at different points. Tendency for the "islands" to have their greatest width in a radial direction, but many exceptions to this. Fibre walls very thick, lumen almost obliterated, thickening laid down so as to give the appearance of concentric zoning in cross sections of the fibres; rounded or angular and of varying diameter. Pits bordered, minute, rather infrequent, rounded. Fibres 250–700 (mostly 300–500) μ long, sometimes filled with deposits, not storied. *Parenchyma* chiefly paratracheal, in the form of isolated cells, or groups of a few cells together around some of the vessels, but not seen entirely surrounding any vessel. Terminal parenchyma present at boundaries of growth rings. Cells somewhat variable in size and shape, a small proportion filled with deposits. *Rays* 9–11 per mm., storied; mostly uniseriate, sometimes partly biseriate, rarely triseriate for a very short distance. (One single, abnormally large ray observed consisting of 3 rows of cells similar in size to the majority of the ray cells, but having in addition a single row of much broader cells). 1–14 (mostly 7–11) cells high. Individual cells thick-walled, varying considerably in size and shape. Marginal cells usually somewhat pointed (tangential section). Tangential walls (as seen in radial sections) almost all vertical.

Material examined:—(1) Kew 67–1929. (2) Forest Products Research Laboratory 2694. (3) Imperial Forestry Institute 2057.

***Brachylaena* sp.**

General colouring and texture of the wood similar to *B. Hutchinsii*. Microscopical structure differing in less frequent vessels of much wider diameter, solitary or in radial series, as well as in groups. *Growth rings* more distinct owing to the greater contrast between the terminal parenchyma and the groundwork of libriform fibres. Paratracheal parenchyma cells larger and more conspicuous. Walls of libriform fibres less thick than those of *B. Hutchinsii*, and concentric zoning in the thickening of the fibre walls less obvious. *Rays* with only a slight tendency to be storied, mostly wholly biseriate and many triseriate.

Material examined:—Yale 14946.

***Brachylaena merana* (Baker) Humb.**

The one specimen available was extremely hard and heavy, but with the same general appearance as *B. Hutchinsii*. In microscopic structure in many respects intermediate between *B. Hutchinsii* and the unnamed species Yale 14946. General arrangement and diameter of the vessels and distribution of parenchyma similar to those in Yale 14946. *Fibres* with extremely thick walls, thickening zoned as in *B. Hutchinsii*. *Rays* storied, uniseriate and biseriate. Pitting very similar to that in *B. Hutchinsii*.

Material examined:—Yale 10767.

EXTRACTS.

Aqueous and alcoholic extracts of the various species of *Brachylaena* pale yellow with a tinge of green. When shavings of any of them are boiled in water a pleasant smell is given off.

Owing to the comparatively small number of vessels in the individual radial groups and on account of the relative infrequency of the vessels and vessel groups the "island"-like appearance of the fibres in transverse sections was not apparent in any of the species besides *B. Hutchinsii*.

The 3 species of *Brachylaena* here described appear to form a series, with *B. Hutchinsii* and *B. sp.* Yale 14946 at either end and *B. merana* intermediate between them. The one abnormal ray observed in *B. Hutchinsii* is of interest as it indicates that there is a tendency for this species with relatively narrow rays occasionally to develop the broader type of ray characteristic of the other species.

(No material of the Santalinas from Madagascar mentioned by Perrier de la Bathie (22) was available during the present investigation, so it has been impossible to draw up descriptions of them. However, from the brief anatomical notes given by him it is quite evident that the Santalinas could not easily be confused with the *Brachylaena* sp. which he mentions. As would be expected, the structure is more similar to that of the other *Santalaceae* described in the present paper. In his Santalinas the vessels are stated to be very infrequent, solitary; diameter 12–15 μ . Vessels elements about 400 μ long. Pits in vessel walls small, arranged in 2–3 longitudinal rows. Fibres thick-walled, pitted, about 500 μ long, arranged in very regular radial rows. Rays narrow, mostly uniseriate, cells elongated vertically. End cells of the rays pointed. No crystals present in rays).

CONVOLULUS SCOPARIUS. L. CANARY ROSEWOOD. BOIS DE TENERIFFE.

Convolvulus scoparius L., a species now confined to the Canary Islands, is stated to be the source of a scented wood of somewhat varying reputation. Reference is made to the oil distilled from the wood in a note published in 1887 (24) in which it is referred to as

rosewood oil. According to this note the yield of oil is so small that distillation is hardly remunerative, and the oil is so weak in odour that it is of little value in perfumery. It is mentioned, however, that when mixed with 20 times its weight of copaiba (*Copaifera*) oil it is used as a bait for wild rabbits and rats, which are attracted by the perfume.

Chevalier (4) on the other hand, writing in 1933 gives a very different account of this wood, to which he refers under the synonym *Rhodrhiza scoparia* Webb. and Berth. He believes the wood to be identical with "bois de Rhodes," "Lignum Rhodium" or "Aspalath," small pieces of which in ancient times were boiled for fumigation purposes. Chevalier points out that it is remarkable that the wood of a plant now confined to the Canary Islands should at one time have been used extensively throughout the Mediterranean region, but he is unable to decide whether it was distributed by caravan from the small region to which it is now confined, or whether the species was then more widely distributed. He also makes the suggestion that the plant might advantageously be cultivated, especially in Morocco.

An account of the general appearance and properties of Canary rosewoods was published in the "Kew Bulletin" for 1893 (14). It is stated in this article that the original *lignum rhodium* came from Macedonia, and that the name was transferred to the wood of *Convolvulus scoparius*. If this is true, the "aspalath" of the Greeks must have been derived from a distinct plant. Hence it is probable that the root wood of *Convolvulus scoparius* was not so widely used in the Mediterranean region as is to be inferred from Chevalier's article, although there is evidence that it was at one time extensively exported from the Canary Islands.

***Convolvulus scoparius* L.** (*Convolvulaceae*). Root wood only. (Fig. 8).

(The following account of the anatomy of *Convolvulus scoparius* and *C. floridus* was drawn up by Mr. B. A. Jay).

GENERAL PROPERTIES AND MACROSCOPIC CHARACTERS.

An extremely hard wood with straight grain and very fine texture. Heart wood golden-brown, sap wood greyish. Strongly scented when freshly cut. *Growth rings* not well defined. *Vessels* invisible to the naked eye, just visible with a lens, very numerous, appearing lighter in colour than the rest of the wood, not individually distinct under a lens. *Parenchyma* not visible with a lens. *Rays* visible with lens, very fine, numerous, lighter in colour than the rest of the wood.

MICROSCOPIC CHARACTERS.

Growth rings.—None apparent in material available. *Vessels*.—Fairly evenly distributed, but tending to be in tangential lines; 190

mostly solitary but also in tangential groups of 2–3 (mostly 3), a few in radial pairs, or sometimes in irregular clusters. Radial diameter of solitary vessels 30–100 (mostly about 60) μ , tangential 30–80 (mostly about 50) μ . 10–27 (mostly 16–20) solitary vessels or vessel groups per sq. mm. Vessel elements 170–250 μ long, end walls somewhat oblique. Perforations simple. Intervascular pits bordered, in horizontal rows, alternate, borders circular, often appearing to have large, deeply scalloped tori, especially on radial walls; apertures circular to slit-like, not extending beyond border, horizontal. Vessel-parenchyma pits bordered, borders circular to oval with long axes horizontal, elongated apertures often somewhat oblique. Vessel-ray pits bordered, circular to oval with long axes horizontal, apertures slightly elongated, very large, irregularly arranged. *Fibres*.—Groundwork of wood composed of extremely thick-walled fibres, the lumen being much narrower than the walls. Tapering gently. Length 570–1200 (mostly 850) μ , irregularly arranged but here and there with a tendency to be in radial rows. Non-septate. Pits with circular borders and slit-like apertures, often crossed, numerous, evenly distributed, mostly on radial walls. Frequent clear yellow deposits. *Parenchyma*.—Paratracheal parenchyma infrequent, where present consisting of solitary cells or a few together. Metatracheal parenchyma very scarce, where present consisting usually of solitary cells. Diameter of cells 8–36 $\times$ 12–36 (mostly 16 $\times$ 20) μ , shape irregular in transverse section, ends horizontal. Pits between parenchyma cells simple. *Traumatic parenchyma*.—Irregular shaped groups of thin-walled cells present, mostly about 100 $\times$ 190 μ as observed in transverse sections. Cells usually with resinous contents. Their mode of development and finer structural details could not be followed in the material available, so that their true nature is uncertain. It seemed possible that they might consist of included phloem, but Dr. L. Chalk of the Imperial Forestry Institute, Oxford (who is making a special study of included phloem) kindly examined one of my slides and expressed the view that the patches consist of traumatic tissue. *Rays* 6–14 (mostly 10) per mm., frequently contiguous to vessels; 1–4 (mostly about 2) seriate, 1–18 (mostly about 9) cells high. Height 30–600 (mostly about 150) μ , width (maximum) 8–50 (mostly about 20) μ . Not storied. Cells 20–50 $\times$ 8–30 (mostly 24 $\times$ 12) μ , oval with longer axes vertical, in radial section much longer than high, marginal cells no larger; tangential walls (radial section) vertical or slightly oblique; transverse walls (radial section) often considerably and irregularly thickened. Pits in radial walls between ray cells few, with borders and apertures circular to oval. Pits in transverse and tangential walls simple. Abundant yellow deposits.

Material examined:—(1) Kew 142–1909.

EXTRACTS.

Aqueous extract almost colourless, but becoming pale lemon coloured on the addition of dilute ammonia. Alcoholic extract

very pale lemon coloured, but colour intensified by adding dil. ammonia. When boiled in water gives off a pleasant, characteristic scent.

***Convolvulus floridus* L. (Convolvulaceae).**

The wood of this species, which is also a native of the Canary Islands, has essentially the same structure as that of *C. scoparius*, but it differs in the following characters:—

The wood is pale yellow with no differentiation into heart and sapwood. Very little scent when cut or boiled.

Growth rings clearly defined as light coloured rings, being formed by 2–5 layers of thin-walled fibres (mostly radially flattened) contiguous to layers of thick-walled fibres. *Vessels*.—No tendency to be in tangential lines, very rarely grouped. Radial diameter of solitary vessels 50–136 (mostly about 100) μ , tangential 34–120 (mostly 85) μ . 4–14 (mostly 6–9) solitary vessels per sq. mm. Vessel elements 160–360 μ long. *Fibres*.—Deposits rare. *Rays* 30–820 (mostly about 250) μ high, and 8–80 (mostly about 25) μ wide, cells slightly larger than in *C. scoparius*. In radial section cells tend to be square. Deposits rare.

Material examined:—Kew 142–1909.

EXTRACTS.

Aqueous and alcoholic extracts of same colour as those given by *C. scoparius*, but no scent given off when shavings are boiled.

***Urandra* sp. Daru-daru or Dedaru (Olacineae. Tribe Icachineae).**

Although the wood sold in the Singapore market as daru-daru or dedaru is not truly a sandalwood, it is, nevertheless, very strongly scented when boiled in water, and it is therefore, included in the present paper. The only specimen available was one from the market at Singapore, kindly supplied by Mr. R. E. Holttum. Its exact botanical identity must be uncertain since it was not accompanied by herbarium material.

The following anatomical description was drawn up by Mr. B. A. Jay.

GENERAL PROPERTIES AND MACROSCOPIC CHARACTERS.

An extremely hard wood with straight and very fine grain, somewhat oily in texture. Specimen too small to show if any differentiation into heart and sapwood. Light brown. Strongly scented when boiled in water. *Growth rings*.—None clearly defined. *Vessels* visible to the naked eye, numerous, evenly distributed, mostly solitary. *Parenchyma*.—None visible with lens. *Rays* very fine, numerous, just visible to naked eye, but quite distinct with lens; lighter in colour than the rest of the wood. *Ripple marks* absent.

MICROSCOPIC CHARACTERS

Growth rings.—None seen. *Vessels*.—Evenly distributed, mostly solitary but also in radial (occasionally tangential) pairs, no clusters observed. Frequently contiguous to the rays. Radial diameter of solitary vessels 60–240 (mostly about 160) μ , tangential diameter 102–190 (mostly about 140) μ . Number of solitary vessels and pairs per sq. mm. 3–8 (mostly 4–5). Vessel elements very short, 85–425 μ . (mostly about 250) μ long, end walls mostly horizontal, a few very oblique. Perforations simple. Some vessels filled with deposits. Intervascular pits bordered, irregularly arranged, borders oval with longer axes horizontal, apertures elongated (mostly beyond border) and horizontal. Vessel-parenchyma pits bordered, borders circular to oval with long axes horizontal, apertures circular or elongated horizontally; large, fairly numerous. Vessel-ray pits simple to half-bordered, large, circular to very elongate, not very numerous. *Fibres*.—Groundwork of wood composed of extremely thick-walled fibres, very angular as seen in transverse sections. Lumen often almost obliterated. Length 750–2500 (mostly 1700–1750) μ . Arranged in irregular radial rows, unseptate. Pits (very clearly seen in transverse sections) mostly in tangential rows, tending to be most frequent in the middle of the fibres, bordered, borders circular and large, apertures elongated vertically (not extending beyond the borders). Lumen in a large proportion filled with deposits. *Parenchyma*.—Paratracheal parenchyma fairly frequent, but not observed entirely surrounding the vessels. Metatracheal parenchyma fairly frequent, usually in groups of 2–4 cells (transverse section). Diameter 19–47 $\times$ 15–47 (mostly 38 $\times$ 23) μ , shape irregular in transverse section, rectangular but elongated vertically in radial and tangential sections, end walls horizontal. Pits between cells simple, irregular in shape, not very numerous, sometimes in clusters, unevenly distributed. *Rays* 4–7 (mostly 5) per mm., 1–4 (mostly 3) seriate, 5–65 (mostly 25) cells high; heterogeneous. Height 187–1620 (mostly 680) μ , width 18–60 (mostly 40) μ , not storied. Cells 11–24 $\times$ 14–43 (mostly 17–27) μ , oval with longer axes vertical; marginal cells considerably elongated. Tangential walls (radial section) mostly vertical or somewhat oblique. Pits in radial walls between ray cells simple, small, not very numerous, apertures circular to oval, irregularly arranged. Pits in transverse and tangential walls simple. No deposits observed.

Material examined:—Singapore. R. E. Holttum. Specimen received in 1933.

EXTRACTS.

Aqueous and alcoholic extracts almost colourless. When shavings are boiled a pleasant characteristic scent is given off.

I am greatly indebted to all those individuals and institutions who have assisted in providing wood specimens and information. Amongst these my thanks are especially due to the Directors of the

Imperial Forestry Institute Oxford, and the Forest Products Research Laboratory, Princes Risborough, to Prof. S. J. Record of Yale University School of Forestry, the Forestry Commission of N.S. Wales, the Department of Woods and Forests, Queensland, and to Mr. A. R. Penfold of the Technological Museum, Sydney. In addition, considerable assistance was afforded by Mr. B. A. Jay, a visitor working at the Jodrell Laboratory, who examined and drew up descriptions of a few of the woods and took the photographs of the wood sections.

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XVI—AFRICAN ORCHIDS: VII.* V. S. SUMMERHAYES.

Habenaria chirensis Rchb. f. *Otia* Bot. Hamburg. 99 (1881); Rolfe in Dyer, *Fl. Trop. Afr.* **7**, 238 (1898); Kraenzl. *Orchid. Gen. et Sp.* **1**, 268 (1898). *Habenaria limnophila* Summerhayes in *Kew Bull.* 1931, 381.

When I described *H. limnophila* I was unable to match it with any of the descriptions of previously described species. As, however, it has proved to be a very common plant in northern Tropical Africa, it seemed likely that it had been described before. On examining the type specimen of *H. chirensis* Rchb. f. in the Reichenbach Herbarium there can be no doubt that the two are identical. Unfortunately the original description is incorrect in two particulars. Reichenbach states "tepals bipartitis, partitione superiori lineari, inferiori linearilancea, subaequali, labelli partitionibus filiformi subulatis subaequalibus." In the specimen, however, the anterior (inferior) lobe of the petal is considerably larger than the posterior (6.7 to 4.5 mm.), while the middle lobe of the labellum is much longer than the lateral lobes (10 to 6 mm.). These errors are, I believe, due to the fact that Reichenbach examined an incompletely opened flower in which the parts had not properly elongated.

Rolfe added to the confusion by interpreting Reichenbach's expression "partitione inferiori subaequali" as meaning "anterior lobe nearly as long as the posterior." He also states in his key (*Fl. Trop. Afr.* **7**, 210) that the stigmatic processes are less than 2 lines long, but there is no evidence for this in the original description; in fact they are $2\frac{1}{2}$ -3 lines long in the type specimen.

* Continued from K.B. 1934, 214.

The type of *A. chirensis* shows very well the two characteristic features of the species, namely, the spur almost equally thickened throughout its length except for the very apex which is slightly widened and almost truncate, and the exceptionally large bilobed staminodes. The species is correctly placed in sect. *Bilabrellae*, not in sect. *Cultratae* as stated by Reichenbach nor in sect. *Dolichophyllae* as stated by Kraenzlin.

Habenaria (§ **Plantagineae**) **Jacobi** Summerhayes, sp. nov.; *H. xanthochilam* Ridl. revocans, sed statura minore, foliis angustioribus, floribus paucis, labelli lobis pectinato-denticulatis differt.

Herba terrestris, 12–13 cm. alta. *Tubera* longiuscule stipitata, ellipsoidea, vix 1 cm. longa. *Caulis* erectus, teres, gracilis, inferne 4–5-foliatus, apice 1–2-florus. *Folia* linearia vel lanceolato-linearia, basi vaginantia, apice acuta, leviter recurvata, 1–4.5 cm. longa, 2–4 mm. lata. *Flores* erecti, verosimiliter partim albi partim virides; bracteae lanceolatae, acuminatae, 7–12 mm. longae; pedicelli cum ovario 12–14 mm. longi. *Sepalum* intermedium erectum, ovatum, acutum, valde concavum, 7 mm. longum, 4 mm. latum; sepala lateralibus reflexa, late semi-ovata, obliqua, leviter acuminata, 7.5 mm. longa, 3.2 mm. lata. *Petala* linearia, leviter falcata, antice basi abrupte dilatata, 5.5 mm. longa, 0.7 mm. lata, cum sepalo intermedio agglutinata. *Labellum* ex ungue lineari 2.5 mm. longo tripartitum, ambitu transverse ellipticum, in toto 1 cm. longum et latum; partitio intermedia unguiculata, obcordatim biloba apiculo interjecto, 7.5 mm. longa, 7 mm. lata, lobis lateralibus breviter pectinato-denticulatis; partitiones laterales oblique anguste obovatae, margine antico fere recto, 7 mm. longae, 2.8 mm. latae, margine postico superne pectinato-denticulatae; calcar dependens, superne leviter inflatum et recurvatum, acutum, circiter 3 cm. longum. *Anthera* 2.5–3 mm. alta, apice rotundata, canalibus leviter incurvato-porrectis 3 mm. longis; staminodia parva, integra. *Rostelli* lobus intermedius breviter triangularis, acutus, 0.7 mm. longus; brachia stigmatifera crasse clavata, obtusissima, leviter recurvata, circiter 2.5 mm. longa.

FRENCH GUINEA. Environs of Kindia, 1929–1932, Jacques 140 (Type in Herb. Mus. Paris.).

Here is yet another West African representative of sect. *Plantagineae*, but one quite unlike the other two species from this region (*H. Engleriana* Kraenzl. and *H. prionocraspedon* Summerhayes). In habit *H. Jacobi* resembles several Indian species, e.g. *H. longicornu* Lindl. and *H. longicalcarata* A. Rich., but is much smaller. In lip structure it approaches most closely *H. xanthochila* Ridl., a native of the Malay Peninsula. In that species, however, the lip segments are all quite entire instead of being shortly pectinate as in *H. Jacobi*. The characteristic feature of both of these species is the bilobed middle-lobe of the lip, this lobe in most members of the section being quite narrow, not lobed and with an entire margin. This is well shown in the two West African species mentioned above

and in *H. decorata* Hochst. from East Africa. *H. Jacobi* bears a strong resemblance to *Cynorchis parva* Summerhayes, which also occurs in French Guinea; in the *Habenaria*, however, the much longer stigmatic arms are quite free from the lateral lobes of the rostellum, not united to them as in *C. parva*. Nevertheless it is possible that the latter is better placed in *Habenaria* than in *Cynorchis*. An exact line of demarkation between the two genera is yet to be discovered.

Polystachya (§ **Caulescentes**) **rhodoptera** Rchb. f. in Hamburg. Gartenzeit. 14, 214 (1858). *P. ensifolia* Lindl. in Journ. Linn. Soc. Lond. Bot. 6, 129 (1862). *P. pyramidalis* Lindl. l.c. 130. *P. carnea* A. Brongn. in Fl. des Serres, 15, 45, t. 1521 (1862–3). *P. sulphurea* A. Brongn. l.c. *P. Wahisiana* De Wild. Not. Pl. Utiles Congo, 318, t. xxi (1904). *P. subcorymbosa* Kraenzl. in Kew Bull. 1926, 288.

A careful comparison of type specimens, descriptions and figures of the above "species" makes it evident that they must be considered as belonging to a single species. There is considerable variation in the size of the plant, the width of the leaves, the amount of branching of the inflorescence (this may be simple in a few cases) and the shape of the lip. I have, however, seen intermediates linking up all the extreme forms, and the general facies both vegetative and floral throughout the species is quite constant.

The name "rhodopterya" first published by Reichenbach was later corrected by him as being a typographical error, the spelling as given above being correct.

Polystachya laxiflora Lindl. in Journ. Linn. Soc. Lond. 6, 129 (1862). *P. galericulata* Rchb. f. Otia Bot. Hamburg. 111 (1881). *P. dixantha* Rchb. f. in Gard. Chron. ser. 2, 17, 294 (1882).

It is obvious from an examination of the type specimen that *P. dixantha* Rchb. f. merely represents an individual of *P. laxiflora* Lindl. in which the branches of the inflorescence have not developed, probably due to unsatisfactory conditions of cultivation (the species was described from a cultivated specimen). These branches are easily visible as very short bud-like outgrowths in the axils of the bracts. In addition the leaves are somewhat narrower than is usual in *P. laxiflora*, but there are specimens in the Kew Herbarium which possess equally narrow leaves together with the normal branched inflorescences. In structure the flowers in Reichenbach's species are identical with those of *P. laxiflora*.

It should be noted that in spite of the remarks by Kraenzlin on pp. 20 and 128 of his monograph of the genus, *P. galericulata* Rchb. f. is correctly placed by Rolfe as a synonym of *P. laxiflora*. The type specimen is at Kew and consists of stems bearing mostly only a single leaf, although one stem has two leaves. The stems (shape), leaves, inflorescences and flowers exactly match those of *P. laxiflora* and are quite unlike those of *P. cultriformis* Spreng.

Polystachya (§ **Elasticae**) **monolenis** *Summerhayes* sp. nov.; affinis *P. reflexae* Lindl., a qua floribus minoribus, labello basi ecalloso medio pulvino singulo pubescente instructo differt.—*P. expansa* Ridl. in Bol. Soc. Brot. **5**, 198 (1887), partim; Rolfe in Dyer, Fl. Trop. Afr. **7**, 122 (1897), partim.

Herba nana, epiphytica; pseudobulbi breviter cylindrici, circiter 1 cm. longi, vaginis obtecti, basi radicibus numerosis flexuosis. *Folia* non visa. *Inflorescentia* 5–8 cm. alta, basi vagina membranacea 2.5 cm. longa inclusa, superne dense multiflora, racemo 1.5 cm. diametro; rhachis breviter pubescens; bracteae ovatae, acuminatae vel apiculatae, 1–2 mm. longae. *Flores* patentes. *Sepalum* intermedium elliptico-ovatum, dorso apiculatum, concavum, 2.8 mm. longum, 1.8 mm. latum; sepala lateralia inaequaliter rotundato-triangularia, dorso infra apicem apiculata, margine juxta sepalum dorsale 3–3.2 mm. longo, margine altero 4.6–4.8 mm. longo, basi cum pede columnae mentum obtusum 4 mm. longum formantia. *Petala* spathulato-oblonga, oblique obtusa, 2.4 mm. longa, 1.1–1.3 mm. lata. *Labellum* basi trilobatum; lobi laterales lineares, breves ab intermedio angulo 45° divergentes; lobus intermedius basi geniculatim reflexus, ex ungue brevi ellipticus, apice rotundatus, 5 mm. longus, 2.5 mm. latus, medio pulvino singulo pubescente instructus. *Columna* crassa, 0.8 mm. longa; anthera quadrato-hemisphaerica, antice longe rostrata; pollinia 4, ellipsoidea, stipite lineari 1.2 mm. longa, viscidio obtuse lunato.

SIERRA LEONE: 1828, *Wilford* (Type in Herb. Mus. Brit.).

This species was confused with two specimens from the island of St. Thomas. It is clear from the description of *P. expansa* Ridl. that the Sierra Leone specimen is not the type since the species is said to have an entire lip with a tooth-like callus at its base.

P. monolenis is yet another member of the interesting section *Elasticae* which so far as is known is almost restricted to West Africa. Unfortunately Kraenzlin omitted *P. saccata* (Finet) Rolfe and *P. Pobeguini* (Finet) Rolfe, from his monograph of the genus. On the other hand *P. rhodoptera* Rchb. f., which was included in sect. *Elasticae* by Kraenzlin, belongs to sect. *Caulescentes*, and I feel doubtful about *P. usambarensis* Schltr., which, judging from the description, seems more suitably placed elsewhere. The section, so far as my investigations go, consists of the following species:—*P. elastica* Lindl., *P. reflexa* Lindl., *P. Victoriae* Kraenzl., *P. expansa* Ridl., *P. Pobeguini* (Finet) Rolfe, *P. saccata* (Finet) Rolfe, *P. pseudo-Disa* Kraenzl., *P. Dalzielii* Summerhayes and *P. monolenis* Summerhayes. I have not seen *P. expansa* and it may possibly be conspecific with one of the others mentioned, although from the description it seems distinct.

Polystachya alpina Lindl. in Journ. Linn. Soc. Lond. Bot. **6**, 131 (1862). *P. Preussii* Kraenzl. in Engl. Jahrb. **17**, 51 (1893). *P. Winkleri* Schltr. l.c. **38**, 154 (1906). *P. Talbotii* Rolfe in Kew Bull. 1910, 282.

These are all forms of the same species as an examination of the type specimens shows. The callus of the lip is variously lobed in the different specimens but has the same general basic structure in all, while in other features the flowers are almost identical. The type specimen (*Mann* 647) consists of very dwarfed individuals with a much reduced 1-flowered inflorescence.

Polystachya golungensis Rchb. f. in Flora, **48**, 185 (1864). *P. mayombensis* De Wildem., Not. Pl. Util. Congo, **134**, (1903), 317 (1904). *P. coriacea* Rolfe in Kew Bull. 1913, 340. *P. Johnsonii* Kraenzl. in Kew Bull. 1926, 291.

On examination of the four species cited above I am unable to discover any differences which can be considered as sufficient for specific separation. The leaves certainly vary in width in different individuals but this feature cannot be correlated with any other differences. The remarkable compact cushion of multicellular hairs at the base of the lip is borne on a thickened callus. As a result of variations both in the thickness of the callus and in the length of the hairs this cushion assumes different shapes in different specimens. In the type specimen of *P. golungensis* the apparent total callus produced is quite prominent, but it is linked by intermediates with quite a low cushion in *Johnson* 588.

The species is distributed from the Ivory Coast eastwards to Mt. Elgon in the north and to Angola in the south-west. So far it has not been recorded from south-east Tropical Africa.

Both *P. golungensis* and *P. coriacea* were placed by Kraenzlin in sect. *Calluniflorae* in his monograph of the genus. *P. Johnsonii*, which was described subsequently, he referred to sect. *Eupolystachyae*, which is undoubtedly the correct position. *P. golungensis* resembles in general features many species of this section but has smaller flowers than most of them.

Polystachya Sandersoni Harv. Thes. Cap. **2**, 49, t. 177 (1863). *P. pachyglossa* Rchb. f. in Linnaea, **41**, 73 (1877) and in Xenia Orchid. **3**, 9, t. 207, fig. 1 (1878).

Reichenbach described *P. pachyglossa* from a plant cultivated in the Royal Botanic Gardens, Kew, in 1870, which was stated by the "gardener" (unnamed) to have come from West Africa and probably from Sierra Leone. This origin was accepted by Rolfe in the Flora of Tropical Africa and later by Kraenzlin in his monograph of the genus. No further specimens agreeing with the original have been so far discovered in West Africa, but a careful comparison with the South African species of the genus reveals so close a resemblance between *P. pachyglossa* and *P. Sandersoni* Harv. that it is impossible to discover any really satisfactory difference.

On consulting the correspondence in the library at Kew it is clear that Mr. McKen, the superintendent of the Durban Botanic Gardens, Natal, sent many living plants of Orchidaceae to Kew between the years 1865 and 1875. Among these were gatherings

of *P. Sandersoni* of which there is corresponding dried material and sketches in the Kew Herbarium. In particular Sanderson, who was in close touch with McKen, sent a living plant of his number 895 in 1868 and it is remarkable that there is a sketch of this number in Reichenbach's herbarium on the same sheet as the type specimen of *P. pachyglossa*. In my opinion the latter species was described from one of the plants sent over from Natal by McKen or Sanderson and the supposed Sierra Leone origin is due to some confusion in labels or mixing of consignments from the two localities.

Bulbophyllum Milesii *Summerhayes*, sp. nov.; affinis *B. coriscensi* Rchb. f. et *B. elongato* De Wildem., ab utroque floribus minoribus, ab illo labello eciliato sed tantum papilloso, stelidiis duplo majoribus, ab hoc petalis lineari-oblongis acutis, scapo brevioris, pseudobulbis duplo minoribus distinguitur.

Herba epiphytica, nana, repens. *Pseudobulbi* 5–10 mm. distantes, ovoidei, compressi, 7–10 mm. longi, circiter 4 mm. lati, apice unifoliati. *Folia* non visa. *Scapus* gracilis, erectus, 3.5 cm. longus; pedunculus rhachidem aequans, vaginis 3–4 breviter acuminatis 3–6 mm. longis instructus; rhachis teres, glabra; bractae lanceolatae, acuminatae, 3–5 mm. longae. *Flores* cremerae; pedicelli cum ovario 2 mm. longi. *Sepalum* intermedium anguste lanceolatum, acutissimum, 4.5–5 mm. longum, 0.7 mm. latum; sepalum lateralia elongato-triangularia, leviter obliqua, acuta, 5–5.5 mm. longa, basi 1.2 mm. lata; omnia sepala glabra. *Petala* lineari-oblonga, acuta, leviter curvata, 2 mm. longa, 0.4 mm. lata. *Labellum* ligulatum, obtusum, leviter curvatum, 1.8 mm. longum, 0.7 mm. latum, medio leviter sulcatum, duabus trientibus distalibus dense papillosum. *Columna* brevis, crassa, 0.6 mm. alta, stelidiis erectis lineari-subulatis 0.9 mm. longis coronata. *Anthera* breviter rostrata, linea media papillosa instructa.

GOLD COAST. Western Province, common, Nov.—Dec. 1912, Miles 19.

A not very remarkable species belonging to the group of *B. flavidum* Lindl., but characterised by its small pseudobulbs.

Bulbophyllum Sect. *Megaclinium*.

There has always been a considerable difference of opinion as to the status which should be given to this group. In the Flora of Tropical Africa Rolfe treated it as a distinct genus, but Reichenbach and Schlechter almost invariably looked upon it as merely a section of *Bulbophyllum*. De Wildeman, in a recent survey of the African species of *Bulbophyllum*, decided also on the latter course, but Kraenzlin has recently again raised the possibility of maintaining the two genera as distinct.

The difficulty has always been one of deciding what are the diagnostic features of *Megaclinium*. Rolfe considered the swollen and/or flattened rhachis and markedly unequal sepals as the distinguishing characters of the genus. This division clearly breaks

down with such species as *B. calyptratum* Kraenzl. and *B. filiforme* Kraenzl. which Rolfe included in *Bulbophyllum* on account of the slender rhachis but which obviously possess the flowers of his *Megaclinium*.

Kraenzlin tried to avoid the difficulty by creating three sections of *Megaclinium* in which the (for him) 2 essential features of thickened rhachis and spathulate dorsal sepal were present, either together or singly (*Vierteljahrschr. Nat. Ges. Zürich*, 68, 424: 1923). This arrangement, however, still omits a number of species which are clearly more closely allied to *Megaclinium* than to the rest of the African *Bulbophyllums*.

De Wildeman (*Pl. Bequaert.* 1, pp. 53–101: 1931) makes no attempt to define his subgenus *Megaclinium*, nor does he consider very fully the characters which have been used for distinguishing it from *Bulbophyllum* proper, but it is more concerned with the validity or otherwise of characters for the delimitation of species. So far as can be seen from his lists of the species of the two subgenera *Megaclinium* and *Eubulbophyllum* his dividing line is the same as Kraenzlin's.

Recently I have had the opportunity of examining critically over 80 African "species" of *Bulbophyllum* and have come to the conclusion that *Megaclinium* can be maintained only as a section of *Bulbophyllum*. I have found it necessary to transfer to sect. *Megaclinium* several species previously included in "*Eubulbophyllum*" in order to obtain a relatively sharp line of demarcation between the two sections. These are as follow, *B. bibundiense* Schltr., *B. calyptratum* Kraenzl., *B. falcipetalum* Lindl., *B. filiforme* Kraenzl. and *B. Rhizophorae* Lindl. *B. Simoni* Summerhayes (*Megaclinium lasianthum* Kraenzl.) was also included wrongly in sect. *Eubulbophyllum*; it is not conspecific with *B. Rhizophorae* as suggested by Schlechter and De Wildeman.

An examination of all the species of sect. *Megaclinium* available reveals a great similarity in floral structure quite apart from the nature of the rhachis. The sepals are very characteristic, the dorsal being fleshy, upright or curved, in some species narrow and acute, in others broad, spathulate and obtuse, with numerous intermediates. It is almost invariably longer, often much longer, than the laterals, which are broad and markedly falcate, with the distal half more or less and often abruptly reflexed. The sepals may be shortly hairy outside especially on the lower parts, but are never ciliate. There is nothing very striking about the petals except that they are almost invariably falcate in shape, this being much more marked in some species than in others.

The lip is very characteristic, being one of the most constant features of the group. In a few species it is pectinately divided at the base but in most it is entire, and is never ciliate or hairy. In fact I have so far never observed the papillae which are so frequently found in other African *Bulbophyllums*. The lip is relatively thin and flattened, and usually markedly curved, the lower surface

being usually provided with a longitudinal keel which prevents it from being flattened out. In some species e.g. *B. Pobeguini* (Finet) De Wildem. and *B. Bufo* (Lindl.) Rchb. f. this keel is very well developed.

The column also possesses characteristic features. The stelidia are rarely much developed, being usually relatively short and in a few cases almost obsolete. In most species there is a broad wing on either side of the column which frequently terminates just below the stelidia in a rounded or triangular free lobe, each lobe being apparently folded inwards across the stigmatic surface, at any rate during part of the floral development.

The combination of all the features mentioned above gives the flower a very characteristic and distinctive appearance quite different from that of the flowers of the other African species of *Bulbophyllum*.

With regard to vegetative characters it may be noted that the pseudobulbs are usually 2-leaved but there are perhaps a half-a-dozen species known which possess 1-leaved pseudobulbs, and 1 or 2 in which the pseudobulbs are 3-leaved.

During the detailed examination of over 30 so-called species of sect. *Megaclinium* it has become evident that many of the characters used as criteria for distinguishing species are quite useless. In particular the degree of widening of the rhachis is of little importance. Provided the rhachis is flattened at all there seems to be no definite width in any given species; most species with this type of rhachis show considerable variation in this respect combined with great uniformity in floral structure. The colour of the rhachis is also of little value, many species possessing forms with green or variously coloured rhachis respectively.

I have therefore been compelled to consider many species as identical with one another; the names accepted and synonyms will appear in my treatment of the genus *Bulbophyllum* in the Flora of West Tropical Africa.

Among the gatherings examined are two which appear to represent undescribed species. I append the descriptions of these two species; both possess 1-leaved pseudobulbs.

***Bulbophyllum* (§ *Megaclinium*) *Linderi* Summerhayes, sp. nov.**; affine *B. leucorrhachidi* (Rolfe) Schltr., a quo pseudobulbis monophyllis, columnae alis sub stelidiis haud dentatis differt.

Herba epiphytica; rhizoma repens, teres, crassiusculum, circiter 3-4 mm. diametro. *Pseudobulbi* 2-3.5 cm. distantes, elongato-ovoidei, obscure 3-angulati, 3-4.5 cm. longi, inferne 1-1.5 cm. diametro, apice monophylli. *Folia* anguste elliptico-oblonga, breviter petiolata, obtusa, 10-20 cm. longa, 1.3-2.2 cm. lata. *Scapi* solitares vel terni, 14-24 cm. longi, erecti rhachide plus minusve falcata; pedunculus 11-15 cm. longus, subgracilis, vaginis pluribus obtusis subdistantibus 4-5 mm. longis instructus; rhachis carnosae, subcompressa, 3-5 cm. longa, 3.5-5 mm. lata; bractae late ovato-triangulares, obtusae vel rotundatae, basi 3-5 mm. latae, deinde

reflexae. *Flores* cremeae, e linea media utriusque rhachidis lateris exorti. *Sepalum* intermedium anguste lanceolatum, acutum, incurvatum, 7.5 mm. longum, 1.5 mm. latum; sepala lateralia valde oblique falcato-ovata, acuta, 4.5 mm. longa, basi 2.5 mm. lata, superne reflexa. *Petala* linearia, acutata, falcata, 6 mm. longa, 0.6 mm. lata, dense papillosa, uninervia. *Labellum* valde curvatum, ambitu elongato-ovatum, obtusum, superne integrum, basi ciliato-pectinatum, apice papillosum, circiter 2 mm. longum. *Columna* incurvata, 2.5 mm. longa, alis integris; stelidia breviter subulata. *Ovarium* glabrum, 3 mm. longum.

LIBERIA. Bumbuma, edge of original forest, on fallen decaying log, Oct. 31st, 1926, G. M. Allen in Linder 1325. "Flowers cream-colour."

One of the group with a much swollen only slightly flattened rhachis and broad triangular bracts nearly the width of the rhachis. The species is clearly closely allied to *B. leucorrhachis* (Rolfe) Schltr., which has 2-leaved pseudobulbs—in spite of the description in the Flora of Tropical Africa—as an examination of the Type specimen easily shows.

***Bulbophyllum* (§ *Megaclinium*) *magnibracteatum* Summerhayes, sp. nov.**; affine *B. bibundiensi* Schltr. et *B. kamerunensi* Schltr., a quibus pseudobulbis multo minoribus monophyllis, bracteis majoribus, petalis oblongo-lanceolatis trinerviis nec linearibus facile distinguendum.

Herba terrestris; rhizoma longe repens, teres, crassiusculum, circiter 2.5-3 mm. diametro, juventute vaginis imbricantibus obtectum. *Pseudobulbi* 2.5-3.5 cm. distantes, anguste ovoidei, 3-angulati, 1.5-2 cm. longi, circiter 1 cm. diametro, apice monophylli. *Folia* anguste oblongo-elliptica, obtusa, brevissime petiolata, 7-8.5 cm. longa, circiter 1.5 cm. lata. *Scapus* erectus, circiter 17 cm. longus; pedunculus teres, 13 cm. longus, vaginis 6-7 arctis apiculatis vel acutis 7-8 mm. longis instructus; rhachis carnosae, compressa, circiter 4 cm. longa, 7 mm. lata; bractae late ovatae, apiculatae, superne leviter carinatae, 8-9 mm. longae et latae, deinde reflexae. *Flores* fuscae, e linea media utriusque rhachidis lateris exorti. *Sepalum* intermedium oblongo-lanceolatum, acutum, concavum, 8.5 mm. longum, 2.5 mm. latum; sepala lateralia oblique falcato-ovata, acuta, 5-7 mm. longa, basi 4 mm. lata, superne reflexa. *Petala* oblongo-lanceolata, subfalcata, subacuta, 5.5 mm. longa, 1.8 mm. lata, trinervia, glabra. *Labellum* valde curvatum, ambitu elongato-ovatum, basi subcordatum, apice obtusum, omnino integrum, circiter 2.5 mm. longum, subtus carina angusta longitudinali instructum. *Columna* vix curvata, 2.5 mm. longa, alis sub stelidiis leviter dilatatis nec lobatis; stelidia breviter subulata. *Anthera* glabra. *Ovarium* glabrum, 4 mm. longum.

GOLD COAST. Imbraim, Western Province, common, Oct.-Dec., Miles 11. "Flowers dark brown, almost covered by large brown bract."

Another example of the fleshy rhachis type with in this case an entire lip. The exceptionally large bracts, very broad petals and small 1-leaved pseudobulbs are the characteristic features of this species.

The following new name is required owing to the existence of *B. lasianthum* Lindl., a Sumatran species:—

Bulbophyllum Simoni Summerhayes, nom. nov. *Megaclinium lasianthum* Kraenzl. in Engl. Bot. Jahrb. 48, 383 (1912).

XVII.—NOTES ON THE FLORA OF SOUTHERN AFRICA: VI.*

Toddaliopsis Bremekampii Verdoorn, sp. nov. [Rutaceae]; affinis *T. sansibarensi* Engl., sed foliolis minoribus oblongo-ellipticis minus acuminatis basi distincte inaequilateralibus, acumine vix obliquo, floribus ♂ in axi inflorescentiae plerumque 3-natis manifeste pedicellatisque differt.

Suffrutex vel arbor parva, 1–7 m. alta. *Folia* 3-foliolata, glanduloso-punctata; petiolus compressus, 1–3 cm. longus; foliola elliptica, nonnunquam obovata, apice obtusa aliquantum attenuata, basi cuneata, 2.5–6 cm. longa et 1–3 cm. lata. *Paniculae* axillares, circiter 2 cm. longae. *Flores* unisexuales. *Flos* ♂: sepala 4, circiter 1.5 mm. longa et 1.5 mm. lata; petala 4, oblonga, 4 mm. longa et 3 mm. lata; stamina 8, petala aequantes; antherae semi-exsertae; ovarium rudimentarium 2 mm. longum. *Flos* ♀: sepala et petala floribus ♂ similia; staminodia 8, fere 2 mm. longa; ovarium globosum, leviter 4-lobatum, 4-loculare vel perraro 3-loculare; stylus brevissimus vel nullus, stigmatibus peltatis; ovula dua in loculis. *Fructus* ± globosus, leviter 4-lobatus, valde tuberculatus, circiter 1.3 cm. diam.

SOUTH AFRICA. Transvaal: Zoutpansberg distr.; on northern slopes at the western extremity of the Zoutpansberg range, *Obermeyer*, *Schweickerdt* and *Verdoorn* 66 (type) and 156; *Schweickerdt* and *Verdoorn* 567; *Bremekamp* and *Schweickerdt* 276.

Until the discovery of this plant on the Zoutpansberg range the genus *Toddaliopsis* Engl. was known only from Zanzibar in Trop. Africa, and it was considered to be monotypic†. In 1931 Dr. C. E. Bremekamp brought to the Nat. Herb. Pretoria a fruiting specimen for identification. The characteristic fruit of *Toddaliopsis* was recognised and at the earliest opportunity the locality was again visited where the plant was found to be abundant. Flowering specimens were procured on a first visit and good fruiting material later. The specific epithet is in honour of Dr. C. E. B. Bremekamp.

* Continued from K.B. 1934, 270.

† Verdoorn in Kew. Bull. 1926, 393, 400.

Ficus Smutsii Verdoorn, sp. nov. (Moraceae); affinis *F. Sonderi* Miq., sed foliis late ovato-cordatis vel sub-orbicularibus, fructibus breviter et dense cinereo-pubescentibus.

Arbor parva (semper?); truncus pallidus, ad saxum adhæsus; ramuli juniores breviter et dense cinereo-pubescentes. *Folia* late ovato-cordata, breviter et late acuminata, apice obtusa vel sub-acuta, nonnunquam sub-orbicularia, 3–7 cm. longa, 2.5–6 cm. lata, utrinque breviter et dense cinereo-pubescentia, infra prominenter reticulata (costa media non furcata); petioli 1–2 cm. longi, dense appresse pubescentes; stipulae pallide brunneae, caducae, oblongo-ovatae, 1 cm. longae, 0.5 cm. latae, plus minusve sparse cinereo-pilosae. *Receptacula* axillaria, sessilia, 6–8 mm. diam., breviter et dense cinereo-pubescentia; bractae basales 3 mm. longae, 2 mm. latae, cinereo-pubescentes; ostium poriforme, bracteis in receptaculum recte descendantibus.

SOUTH AFRICA: Northern Transvaal: Zoutpansberg; Magalakwin, growing on rocks, *J. C. Smuts* in Nat. Herb. No. 17103; *J. C. Smuts* in Herb. Pole-Evans 1998; Klein Bolaaia, 14 miles East of Dongola, on rock, *Pole-Evans* 2530; northern slopes, Zoutpansberg range, western extremity, *Schweickerdt* and *Verdoorn* 600 (type).

In 1926 Gen. The Right Hon. J. C. Smuts collected this plant at Magalakwin, and it was found to be unlike any known species of *Ficus*. While approaching *Ficus Sonderi* in some characters, it is nevertheless quite distinct from that species, *F. Sonderi* being a large tree with spreading branches, leaves oblong, the fruits and young parts shaggy-pilose, while *F. Smutsii* is a small tree with ovate or sub-orbicular leaves and a dense short ashy-grey pubescence covering fruits, leaves and twigs. In 1929 Dr. I. B. Pole-Evans collected a specimen from near Messina, which compared exactly with that from Magalakwin.

During April of last year Dr. Schweickerdt and the author, while on a botanical survey of the area surrounding the Zoutpan which lies at the western extremity of the Zoutpansberg range, came upon a cave at the back of which a whitish stem about 1 ft. in diameter was observed threading its way up the face of the rock. On investigation the cave was found to have an upper mouth and from it a tree was protruding, evidently produced from the stem appressed to the rock. Specimens were collected and these proved to be the same as the material from Magalakwin and Klein Bolaaia near Messina. The name is in honour of Gen. Smuts who first collected the species.

Euphorbia aeruginosa Schweickerdt, sp. nov. [Euphorbiaceae]; affinis *E. Schinzii* Pax, sed colore ramorum et podariis rubiginosis saepe 5-aculeatisque differt.

Fruticulus succulentus, spinosus, aphyllus, usque ad 15 cm. altus, multi-ramosus. *Rami* plerumque subcylindrici (indistincte 4-angulati), 0.5–0.75 cm. diam., glabri, aeruginosi, saepe spiraliter contorti, facibus lateralibus indistincte concavis, podariis corneis

rubiginosis validis 5-aculeatis praeditis. *Podarii* quadrifarii, nunquam confluentes, 5-7 mm. longi et 3 mm. lati, apice fere truncato. *Aculei* superiores fere 4 mm. longi, medii usque ad 20 mm. longi; aculeus inferior (si adest) fere 1.5 mm. longus. *Cyma* sessilis, ternis cyathis. *Cyathia* infundibuliformia, lutea, glabra, 3 mm. diam., ad basin bi-bracteata, quinque lobis obovatis fimbriatis et glandulis transverse oblongis integris munita. *Margo glandulae* intra leviter recurvatus. *Ovarium* glabrum, breviter pedicellatum, inclusum. *Styli* 2 mm. longi, ad basin breviter connati, articulati, apice minute bifidi vel subintegri. *Capsula* breviter pedicellata, partim exserta, 3 mm. diam., trilobata glabraque. *Semina* (immatura) tuberculata.

SOUTH AFRICA. Transvaal: Zoutpansberg distr.; on northern slopes of the Zoutpansberg range, Obermeyer, Schweickerdt and Verdoorn 151 (syn-type); Schweickerdt and Verdoorn 688 (syn-type); van Balen s.n.

This species is a typical chasmophyte. It grows in the fissures between rocks where it forms dense clusters up to 25 cm. in diameter. Growing in exposed situations these plants present a striking appearance; the bright copper-green of the stems contrasts strongly with the shiny bright reddish-brown 4-ranked shields bearing the spines.

Caralluma maculata N. E. Br. in Fl. Tr. Afr. 4, pt. 1, 487 (1904). *C. grandidens* Verdoorn in Fl. Pl. S. Afr. t. 518 (1932).

The description of *C. maculata* was drawn up from dried material, a task which in succulent plants always proves to be a very difficult one. Several inaccuracies in this description account for the fact that Nat. Herb. Pretoria no. 15,271 was not identified as that species but was considered to be closely allied yet distinct (*C. grandidens* Verdoorn, l.c.). The corolla-lobes of *C. maculata* are described as being "½ lin." wide. Examination of the type in Herb. Kew leads one to believe that this is a typographical error which probably should read "4 lin." wide. Comparison of the material and the figure of *C. grandidens* with the former species has furthermore shown both plants to be one and the same species. *C. grandidens* Verdoorn is consequently invalidated by *C. maculata* N. E. Br. For purposes of identification, the description of the latter species should be amended from or replaced by the description of the former species which is accurate, since it was based on living material.

Dicoma prostrata Schweickerdt, sp. nov. [Compositae]; affinis *D. eleganti* Welw. ex Hoffm., sed foliis supra appresse resinosis glandulosisque, flosculis minoribus, bracteis involucribus abruptius et longius attenuatis, setis pappi basi haud dilatatis differt.

Herbacea, basi lignescens, caule ramisque tomentosis, foliosis, prostratis. *Folia* linearia, usque ad 4 cm. longa et 1.25 mm. lata, acuta, subrigida, supra resinoso-lanata glandulosa et costa intermedia immersa, subtus densissime albo-lanata et costa intermedia elevata,

marginibus irregulariter minute dentata. *Capitula* majuscula, usque ad 3 cm. longa et 2 cm. diametro, inter folia suprema sessilia, solitaria. *Bractee involucriales* ∞ seriatae, erectae vel patentes haud recurvatae, glabrae, nitidae; infimae stramineae, subrigidae; superiores pallide lilacinae, anguste lanceolatae, usque ad 2 cm. longae et 3 mm. latae, in mucronem longum tenuemque attenuatae. *Setae pappi* homomorphae, pallide stramineae, barbellatae, basi haud dilatatae. *Achaenia* ignota.

TRANSVAAL PROVINCE: Waterberg District; 23 miles north of Nylstroom, on rocky slopes in open woodland, June 1930, J. B. Gillett 3807 (type).

Dicoma montana Schweickerdt, sp. nov. [Compositae]; a *D. Galpinii* Wilson foliis multo minoribus, supra haud glanduloso-punctatis, utrinque albo-lanatis, bracteis extra dense arachnoideis bene distinguitur; affinis *D. Nachtigalii* O. Hoffm., sed capitulis valde pedunculatis, flosculis minoribus et bracteis angustioribus differt.

Frutex nanus, lignosus, multi-ramosus; innovationes usque ad 12 cm. longae, dense albo-lanatae. *Folia* usque ad 2 cm. longa et 1 cm. lata, late lanceolata vel ovata, breviter petiolata, basi cuneata, apice acuta vel obtusa, margine minute serrata, supra sparse lanata ac eglandulosa, subtus dense lanata. *Capitula* solitaria, pedunculata, late campanulata, usque ad 1.5 cm. longa et 2 cm. diam., aranachnoidea. *Bractee* ± 7-seriatae, lineari-lanceolatae, apice attenuatae et scabridae, rigidae et recurvatae, extra arachnoideae intus glabrae. *Setae pappi* homomorphae, stramineae, 4-5 mm. longae, barbellatae. *Achaenia* pilis stramineis adscendentibus ornata.

TRANSVAAL PROVINCE: Zoutpansberg District; Blaauwberg, 1500-1650 m., May 1933, Leeman 68 (type).

Loudetia filifolia Schweickerdt, sp. nov. [Gramineae]; affinis *L. flavida* (Stapf) C. E. Hubbard, sed culmis brevioribus gracilioribus basin versus ramosis, foliorum laminis angustioribus et brevioribus, panicula et spiculis minoribus differt.

Gramen perenne, caespitosum, basin versus ramosum ramis intravaginalibus. *Culmi* erecti, usque ad 35 cm. alti, gracillimi, striati, glabri laevesque, plerumque 1-2-nodes; internodia exserta; nodi minutissime pubescentes. *Folia* plerumque 5-7, 3-4 basin versus disposita, cetera remota; vaginae glabrae vel minutissime asperulae, inferiores persistentes, nonnunquam leviter sericeo-villosae, nunquam in fibras rigidas fissae, superiores glabrae; ligulae ciliolatae, saepe setis longis marginalibus instructae; laminae involutae, curvatae, anguste lineares, apicem versus attenuatae, usque ad 10 cm. longae et 2.0 mm. latae, valde nervatae, supra minute pubescentes, subtus glabrae, marginibus minute ciliatis. *Panicula* usque ad 7.5 cm. longa, erecta, leviter contracta, nunquam spiciformis; rhachis angularis, tortuosa, striata, minute pubescens;

rami circiter 2.5 cm. longi, solitarii vel bini vel trini, filiformes, inaequales, pubescentes, basi barbati. *Spiculae* solitariae vel binae, dilute fuscae, usque ad 7 mm. longae. *Gluma inferior* 3-nervis, ovata, 3.5 mm. longa, minute pubescens, apicem versus nonnunquam pilis paucis longioribus praedita, apice minute et inconspicue biloba et inter lobos arista usque ad 2 mm. longa instructa; gluma superior fere 6 mm. longa, acuta, glabra vel extra pilis minutissimis praedita, 3-nervis. *Anthoecium inferum* ♂; lemma glabrum, acutum, fere 5 mm. longum, 3-nerve; palea membranacea, glabra, 2-carinata, carinis minutissime ciliatis. *Anthoecium superum* ♀; lemma fere 4 mm. longum, sericeo-villosum, 9-nerve, bilobum, lobis brevissimis acutis; arista pubescens, circiter 20 mm. longa, columna aristae 8 mm. longa; callus truncatus vel leviter emarginatus, barbatus, 0.5 mm. longus; palea 3.5 mm. longa, 2-carinata, carinis minutissime ciliatis. *Antherae* 3, 2.5 mm. longae. *Caryopsis* ignota.

TRANSVAAL: Zoutpansberg District; Zoutpan, frequent in rock-crevices on northern slopes of the Zoutpansberg, *Schweickerdt and Verdoorn* 523.

Sporobolus Schlechteri *Schweickerdt*, sp. nov. [Gramineae]; affinis *S. centrifugus* Nees, sed vaginis basalibus opacis tenuioribus et spiculis paullo minoribus differt. *S. centrifugus* Stent in *Bothalia* 2, pt. Ib, 259 (1927), non Nees.

Gramen perenne, caespitosum. *Culmi* simplices, graciles, erecti, glabri laevesque, 1–2 nodi, usque ad 40 cm. alti; internodia plerumque exserta; nodi glabri. *Foliorum vaginae* basales breves, latae, dense imbricatae, valde striatae, glabrae, pallidae, opacae nunquam nitidae, persistentes, superiores glabrae, striatae, marginibus ciliatis; ligulae brevissime ciliolatae; laminae lineares, in apicem longe attenuatae, planae vel involutae, 2–3.5 mm. latae et usque ad 25 cm. longae, marginibus pilis rigidis e tuberculis minutis ortis ceterae glabrae. *Panicula* erecta, ovata, laxa vel plus minusve leviter contracta, 2.5–5 cm. lata, usque ad 10 cm. longa; axis glaber, leviter flexuosa; rami verticillati, flexuosi, superiores binati vel solitarii, filiformes, 1–3 cm. longi; ramuli et pedicelli brevissimi. *Spiculae* paucae, apicem ramorum versus aggregatae, olivaceo-fuscae, plus minusve 3 mm. longae. *Gluma inferior* lanceolata, plerumque 1-nervis, fere 2.25 mm. longa, glabra vel minutissime puberula; gluma superior 1-nervis, glabra vel minutissime puberula, spiculam aequans vel excedens; lemma ovatum, acutum, 1-nerve, 3.25 mm. longum; palea lemma aequans, truncata vel late obtusa. *Antherae* 3, 1.5 mm. longae. *Caryopsis* ignota.

TRANSVAAL: Lydenburg District, near Lydenburg, *Schlechter* 3965, in *Herb. Kew.* (type).

ORANGE FREE STATE: Bethlehem District, near Bethlehem, *Richardson* s.n.

Dieterlen 671 (*Herb. Mus. Austro-Afric.* No. 6328) is cited by Stent partly under *S. centrifugus* and partly under *S. filifolius*. The sheet of this number in the Kew Herbarium contains the same

mixture. The inflorescence of the complete specimen is referable to *S. Schlechteri*, but some of the leaves bear tubercle-based hairs on their lower surface. On the same sheet three inflorescences without bases match those of *S. filifolius* Stent.

The type (*Drege* 3894 from “steinige Höhe im Grase, zwischen Klipplaatrivier und Zwartkey” in *Herb. Mus. Bot. Berol.*) of *S. centrifugus* Nees as well as other specimens of *Drege* from the Windvogel mountain, Cathcart Division, all quoted by Nees under *S. centrifugus* have shiny, brownish-yellow, firm basal leaf-sheaths a character of *S. Tysonii* Stent. The syn-type number *Tyson* 1473 of the latter species in the Kew Herbarium is typical *S. centrifugus* Nees.

Examination of specimens quoted by Stent under *S. laxivaginatus* has further shown this species to be identical with *S. centrifugus* Nees. The “larger panicle” and “darker and more crowded spikelets, broader and looser sheaths” are variable in character and thus of no taxonomic value; the basal sheaths of “a polished smoothness” are characteristic of *S. centrifugus* Nees.

The synonymy is thus as follows: ***Sporobolus centrifugus*** Nees in *Fl. Afr. Austr.* 158 (1841) = *S. Tysonii* Stent in *Bothalia*, 2, part Ib, 262 (1927) = *S. laxivaginatus* Stent l.c., 262.

Sporobolus artus Stent in *Bothalia*, 2, part Ib, 260, 272 (1927). Nees' type of *S. centrifugus* var. *angustus* (*Drege* 4261 in *Herb. Mus. Bot. Berol.*) agrees in every detail with specimens quoted by Stent under the above species. *S. artus* Stent l.c. = *S. centrifugus* var. *angustus* Nees in *Fl. Afr. Austr.* 159 (1841).

XVIII—RESEARCHES ON *SILENE MARITIMA* AND *S. VULGARIS*—XIV*.

E. M. MARSDEN-JONES AND W. B. TURRILL.

ADDITIONAL STUDIES OF ANTHOCYANIN INHERITANCE AND OF OTHER CHARACTERS IN *S. MARITIMA*.

The breeding described in this paper involves only one stock plant (S.P. 22). The population from which this came is referred to in our papers II and III of this series (K.B. 1929, 36, 173). It may be recalled that hybrids between *S. maritima* and *S. vulgaris* as well as the two parents occurred at Dawlish near together. The stock-plant 22 was chosen for further investigation because of its large leaves (relative to typical *S. maritima*), its small coronal scales, and its tubercled seeds. It and all its subsequent progeny bred true to the production of over-wintering barren shoots (i.e. it was chamaephytic).

* Continued from K.B. 1934, 389.

A.22. Lea Mount, Dawlish, Devon, on Red Sandstone cliff, 1927.

Habit: semi-prostrate, stems up to 4 dm. long; a little anthocyanin in upper part of stems.

Leaves: linear to oblanceolate-linear, 3.2 cm. long, 6 mm. broad, colour glaucous green, margins distinctly ciliate.

Inflorescence: of 1-7 (usually 1-5) flowers, erect and actinomorphic. Bracts all strongly ciliate, lower green, herbaceous, similar to uppermost leaves, lanceolate, slightly acuminate, upper smaller, ovate-lanceolate to ovate, and becoming completely scarious.

Calyx: broadly ellipsoid in flower with a medium amount of brownish anthocyanin, becoming broadly obovoid in fruit.

Corolla: with petals divided three-quarters length of lamina, bilobed, segments and petals not contiguous or overlapping, diameter 3.3 cm.; petals 2.7 cm. long, 1.6 cm. broad, corona of small scales, no anthocyanin blotch above or below.

Androecium: fully developed, flowers hermaphrodite. Filaments white; anthers purple.

Gynoecium: with white stigmata and pink immature seeds.

Ripe capsules: obloid, without the teeth 7 mm. long, 8 mm. broad, mouth 5.5 mm. in diameter; teeth each an isosceles triangle, reflexed, 3 mm. long, 2 mm. broad; carpophore 3 mm. long, 3 mm. diameter.

Mature seeds: tubercled.

N.55.—Stock plant A.22 selfed.

40 plants in family.

Habit: semi-prostrate, stems up to 4 dm. long. 13 plants without anthocyanin in stems, leaves, or calyx, i.e. the whole plant up to the corollas yellow-green. 27 plants with a little anthocyanin in the upper parts of the stems and medium amount in the calyx.

Leaves: Uniformly as in parent.

Inflorescence: of 3 to 7 flowers, erect and actinomorphic.

Calyx: broadly ellipsoid in flower.

Petals: all bilobed except one multilobed (No. 2), all with three-quarter lobing, in all plants petals and segments not overlapping or contiguous, in all plants no blotch.

Corona: 13 full scales: 22 small scales: 1 boss.

Androecium: all plants hermaphrodite.

Filaments: all white.

Anthers: 13 yellow-green: 27 purple.

Gynoecium: in all plants stigmata white. Immature seeds 25 pink: 11 pale pink: 2 white. There is complete correlation between pink seeds and anthocyanin in vegetative parts and calyx and purple anthers. All plants with yellow-green vegetative parts and calyx have yellow-green anthers and pale pink or white seeds.

Ripe capsules: with the plants scorable for fruits the following ratios were obtained:

Shape: I.3: I-II.16: II.11.

Teeth: R 19: S-R 7: S 3.

For the teeth, R indicates reflexing, i.e. a *Silene maritima* character; S indicates spreading, i.e. an F_1 (*S. maritima* x *S. vulgaris*) character; S-R indicates that the teeth were for the most part slightly reflexing.

Mature seeds: 1 weak armadillo: 24 tubercled: 5 strongly tubercled.

N.81. Plant 55.5 selfed. This plant was yellow-green without anthocyanin in the vegetative parts and calyx, had a full scale, yellow-green anthers, pale pink immature seeds, I-II capsule shape, reflexed teeth and tubercled seeds. 124 plants in family.

Habit: as immediate parent, stems up to 5.9 dm. long. All plants without anthocyanin in stems, leaves, or calyx, i.e. yellow-green in colour.

Leaves: uniformly as in parent.

Inflorescence: of 1 to 7 flowers, erect and actinomorphic.

Calyx: broadly ellipsoid in flower.

Petals: all bilobed, except those of Nos. 59 and 102 which were slightly multilobed, all three-quarters lobed, all petals and segments not overlapping or contiguous, in all no blotch.

Corona: 98 full scales: 17 small scales.

Androecium: all plants fully hermaphrodite, except three (Nos. 32, 79, 89) which produced some female flowers as well as hermaphrodite ones.

Filaments: all white.

Anthers: all yellow-green.

Gynoecium: In all plants stigmata white. Immature seeds 81 pale pink: 34 white.

Ripe capsules: with the plants scorable for fruits the following ratios were obtained:

Shape: I.2: I-II. 106: II.1.

Teeth: S-R 6: S 103.

Mature seeds: 109 tubercled.

N.82. Plant 55.17 selfed. This plant had anthocyanin in the vegetative parts and calyx, a small scale, purple anthers, pink immature seeds, I-II capsule shape, reflexed teeth and tubercled seeds. 132 plants in family.

Habit: as immediate parent, stems up to 4.8 dm. long. 28 plants without anthocyanin in stems, leaves, or calyx, i.e. the whole plant, up to the corollas, yellow-green. 103 plants with a little anthocyanin in the upper part of the stems and a medium amount in the calyx.

Leaves: uniformly as in parent.

Inflorescence: of 1 to 5 flowers, erect and actinomorphic.

Calyx: broadly ellipsoid in flower.

Petals : all bilobed, except 17 multilobed, all with three-quarters lobing, except in 8 plants with two-thirds lobing, petals and segments not overlapping or contiguous in all except 7 plants with petals overlapping and segments not overlapping, 1 plant with segments overlapping and petals not overlapping, and 1 plant with petals and segments overlapping, in all no blotch.

Corona : 7 full scales : 98 small scales : 1 boss. In addition 3 plants showed fluctuation between scale and small scale, 19 between small scale and boss.

Androecium : all plants fully hermaphrodite except 5 (Nos. 1, 16, 48, 56, 59) which produced some female flowers as well as hermaphrodite ones.

Filaments : all white.

Anthers : 26 yellow-green, 103, purple.

Gynoecium : In all plants stigma white. Immature seeds 103 pink : 8 pale pink : 18 white. There is again complete correlation between pink seeds and anthocyanin in vegetative parts and calyx and purple anthers. All plants with yellow-green vegetative parts and calyx have yellow-green anthers and pale-pink or white seeds. Two plants, scored, for yellow-green vegetative parts could not be scored for flower characters. They would probably have had yellow-green anthers and either pale-pink or white immature seeds.

Ripe capsules : with the plants scorable for fruits the following ratios were obtained :

Shape : I-II. 122 : II.I.

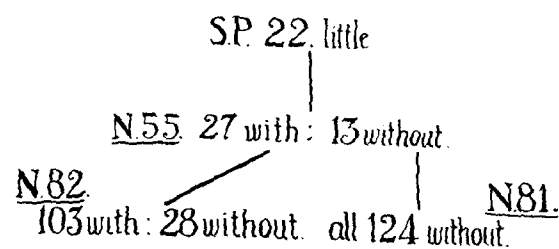
Teeth : R 14 : S-R 51 : S 58.

Mature seeds : weak armadillo 5 : tubercled 118. Of the tubercled, 21 were very weakly tubercled and verged towards weak armadillo.

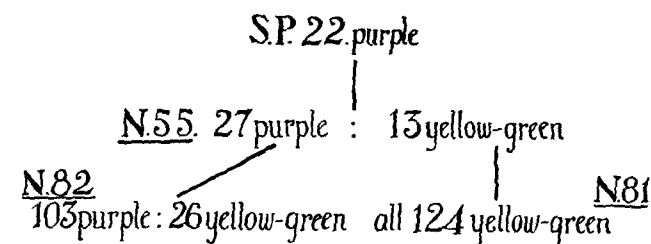
DISCUSSION.

Anthocyanin inheritance.

For the vegetative parts and calyces the results can be shown as follows :

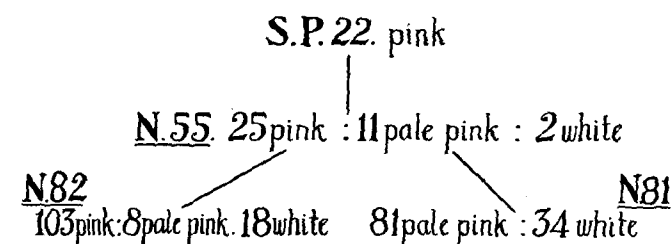


For anthers :



In S.P.22 and in all subsequent progeny the filaments and stigmata were white.

For immature seeds the following scheme illustrates the results :



It is evident that absence of colour is recessive to its presence and that plants with yellow-green foliage and calyces, white filaments, yellow-green anthers, and white stigmata breed absolutely true for these characters. It is known also, from earlier published work (e.g. K.B. 1932, 230, N.15, N.20, and also Addendum to the present paper, N.103) that plants with white immature seeds breed true to this character. It is further to be noted that there is exact correlation between presence and absence of anthocyanin in vegetative parts and calyces on the one hand and in the anthers on the other, in the families here considered, but not between these and anthocyanin in filaments and stigmata. Further there is exact correlation between presence of anthocyanin in vegetative parts, calyces, and anthers on the one hand and full pink seeds on the other hand, but that white and pale pink seeds are always associated with yellow-green foliage, calyces, and anthers.

Habit, leaves, inflorescences and calyces : apart from anthocyanin characters all families here discussed bred true for habits, leaf, inflorescence, and calyx characters, which were uniformly similar to those of the parent.

Corolla : lobing was constantly three-quarters, except that 8 plants with two-thirds lobing occurred in N.82. All plants were bilobed except 1 in N.55, 2 in N.81, and 17 in N.82 which were more or less multilobed. The petals in all were not contiguous or overlapping except in 9 plants in N.82. In no plants had petals an anthocyanin blotch.

Corona : the original parent (A.22) had small scales approximately of the type found in F_1 , on crossing a bossed *S. vulgaris* with a full scaled *S. maritima* (see K.B. 1928, 2, fig. 5). On selfing segregation occurred with 13 scales : 22 small scales : 1 boss. Selfing one of the plants with scales the ratio 98 scales : 17 small scales appeared, apart from fluctuating intermediates, and on selfing one of the small scale plants the ratio 7 scales : 98 small scales : 1 boss. Although no simple genetical explanation can be given to these figures it is evident that a plant with full scales shows this character predominantly in its offspring and plants with small scales have mainly offspring with small scales.

Sex : the original parent and all subsequent progeny were hermaphrodite except 3 plants in N.81 and 5 in N.82 which produced some female flowers in addition to hermaphrodite ones.

Ripe Capsules : the original parent had obloid (II) capsules and gave on selfing I.3 : I-II. 16 : II. 11. The two subsequent families were taken from plants with intermediate capsules and gave progeny mainly with intermediate capsules.

Reflexing of teeth of capsule : the original stock plant had reflexed teeth (a *Silene maritima* character). No plants with erect teeth (a *Silene vulgaris* character) appeared in the offspring but plants with more or less spreading teeth appeared in N.81 and N.82 in predominant numbers.

Mature seeds : these were tubercled in all families except that one weak armadillo appeared in N.55 and five in N.82.

Comments.

(1) It is suggested that both phenotypically and genotypically S.P.22 has shown indications of ancestral hybridization with *S. vulgaris*. Its foliage is not unlike that found in some *S. vulgaris* plants, though it breeds true for foliage characters. Again, the corona showed an intermediate stage of development between that typical for *S. maritima* and that typical for *S. vulgaris*. In the offspring segregation occurred for this character with the appearance of both full scales and bosses. Further support is given to the suggestion by segregation for the capsule character of reflexing or spreading teeth. The field studies already referred to indicate how the hybridization could have occurred.

(2) In dealing with wild material in *Silene* and in other genera, we do not find, with some exceptions, the clear-cut segregation and simple ratios recorded for so many cultivated plants. Our evidence is cumulative and we feel must now have considerable significance. While one nearly always finds dominant or semi-dominant characters that are introduced in a cross appear in predominant numbers in later families, it seems that interaction of many factors, and even the action of the whole "genic background" is usually more pronounced in wild than in long cultivated and long selected material.

The difficulty of scoring in wild material is frequently enhanced by the occurrence of "fluctuations" which overlap in a peculiar

manner with characters having a genetic base. Such fluctuations occur for example, in the "sex" of flowers, in calyx shape, petal lobing, coronal development, and capsule shape, as well as in other characters, *on the same individual plant*. In general, fluctuations of the type exemplified are greater and more frequent in plants heterozygous for the characters concerned than in corresponding homozygotes. The problems arising from this comment are being carefully considered.

SUMMARY.

An account is given of selfing a wild plant of *S. maritima* through two generations. It is shown that there is evidence for ancestral crossing with *S. vulgaris* which has modified the plant phenotypically and has led to some heterozygosity not usually found in *S. maritima*. Ratios obtained by the analysis of the characters being studied in this series of papers are given and some of them correlated with previously obtained results.

ADDENDUM.

In the eighth paper of the series we dealt, *inter alia*, with the genetics of anthocyanin inheritance in *S. maritima*. Three F_1 families from intercrossing three stock plants were analyzed, and F_2 families from two of these F_1 's were also analyzed. An F_2 family from the third F_1 (N.21, i.e. S-P 7 $\times$ S-P 12) has since been raised. The following is an account of the results obtained.

N.103. N.21 plant 1 selfed. 60 plants in family.

Habit : as in immediate parent and uniform. Whole plant absolutely devoid of anthocyanin.

Leaves, Inflorescence, and Calyx : as in immediate parent and uniform.

Corolla : petals in all plants overlapped. Segments in 30 plants overlapped or were contiguous in 30 they did not. Lamina lobed three-quarters. Scales well developed. No anthocyanin blotch. In 25 plants petals bilobed. In 35 plants petals multilobed.

Androecium : with filaments of all plants white, anthers yellow-green ; 32 plants with hermaphrodite flowers only, 21 plants with hermaphrodite and female flowers, 7 plants with female flowers only.

Gynoecium : with stigmata and immature seeds white.

Ripe capsules : of 20 plants broadly ovoid, of 40 obloid.

Mature seeds : of all plants armadillo.

The above results indicate that S.P.7 and S.P.12 had not between them the complementary factors for anthocyanin development in any organ.

The research on which this paper is based has been aided by a Royal Society Government Grant.

XIX — RESEARCHES ON *SILENE MARITIMA* AND *S. VULGARIS*—XV.*

E. M. MARSDEN-JONES AND W. B. TURRILL. *SECOND SELFED FAMILIES FROM A WILD STOCK-PLANT OF *S. VULGARIS*.*

In paper five of this series (K.B. 1931, 119) we described a wild stock plant (No. 5) from Potterne Field, Wilts., and in paper six (K.B. 1931, 348) a family of selfed offspring (N.12 or x 12). Two plants of this N. 12 family were selfed and the analysis of the results obtained is given in this paper. The plants were especially chosen in the hope of obtaining further information on the modification of the testa pattern we have named "weak armadillo."

N. 101. = N. 12-251 selfed. 72 plants in family.

Anthocyanin in vegetative parts : 67 much : 2 little : 2 none.

Two plants had shining green surfaces, the remainder were mat.

Indumentum : 26 few hairs : 45 glabrous.

Habit : all plants ascending from a slight basal spread. Maximum stem height 7 dm. Over-wintering barren shoots were not present above ground, i.e. the plants were hemicryptophytes.

Leaves : in all plants these were uniform for *S. vulgaris*.

Inflorescence : with up to 144 flowers, which were all of the zygomorphic shape.

Calyx : in all plants inflated and with medium anthocyanin.

Petals : in all plants white and bilobed with $\frac{3}{4}$ lobing, no anthocyanin blotch. Petals and segments not overlapping or contiguous, except in No. 25 the petals overlapped and in No. 29 the segments overlapped. 8 small scale : 57 boss.

Androecium : all plants with anthers had these purple. Filaments 11 purplish : 36 white.

Sex : 30 plants had hermaphrodite flowers only, 17 had hermaphrodite and female flowers, 18 had female flowers only.

Gynoecium : stigmata 28 plants purplish : 37 plants white. All plants had white immature seeds.

Mature capsules : I. 8 : I.-II. 33 : II. 10.

Mature seeds : of all plants armadillo.

N. 102. = N. 12-172 selfed. 19 plants in family.

Anthocyanin in vegetative parts : 17 much : 1 little. 8 shining green : 9 mat.

Indumentum : 3 medium : 7 few hairs : 8 glabrous.

Habit : as in N. 101.

Leaves : as in N. 101.

Inflorescence : as in N. 101.

Calyx : as in N. 101.

Petals : in all plants white and bilobed, with $\frac{3}{4}$ lobing except in one plant with $\frac{3}{4}$ lobing, no anthocyanin blotch. Petals and seg-

ments not overlapping or contiguous, except in No. 12 where the segments overlap, all with boss.

Androecium : all plants with anthers (6 only) had these purple and the filaments white.

Sex : 4 plants had hermaphrodite flowers only, 2 had hermaphrodite and female flowers, 9 had female flowers only.

Gynoecium : stigmata 3 plants purplish : 12 plants white. All plants had white immature seeds.

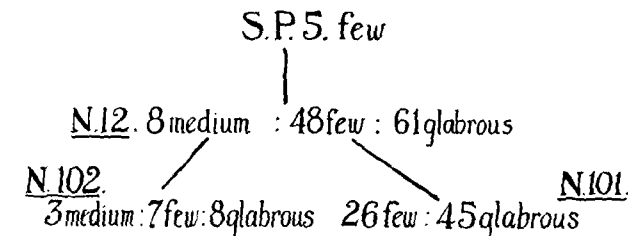
Mature capsules : I. 1 : I.-II. 9 : II. 5.

Mature seeds : 5 weak armadillo : 10 armadillo.

DISCUSSION

Anthocyanin. None of the plants in these families is the equivalent of the yellow-green plants previously analysed in *S. maritima* and probably all plants were genetically capable of producing anthocyanin. The degree of production is here probably due to fluctuation within one genotype.

Indumentum.



As in previous research on indumentum the degree of hair development in the offspring family as a whole is correlated with the degree of hair development in the parent or parents.

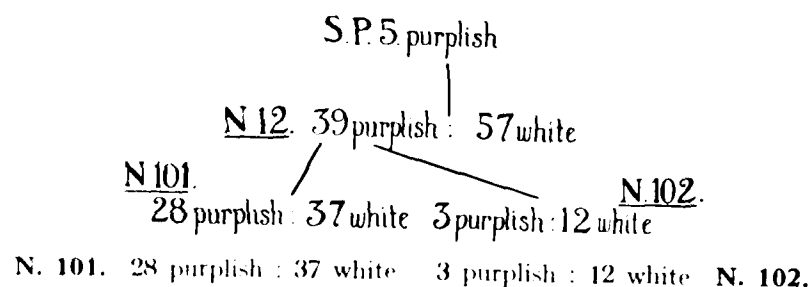
Corona. In N. 12 only one plant (among 117) had small scales, the rest like the immediate parent had bosses. The small scaled plant on selfing gave 8 small scales : 57 boss. A plant with bosses gave all bosses in the offspring on selfing. A plant with small scales was found in the wild in the same locality. There can be no question of recent contamination with *S. maritima*, though F_1 plants of *S. vulgaris* $\times$ *S. maritima* have a similar coronal development.

Androecium. The original stock plant and its offspring No. 251 were heterozygous for filament colour. No. 172 was also probably heterozygous but the only six plants scorable for the character had white filaments. Absence of colour on filaments does not necessarily involve absence of colour in anthers or stigmata.

Sex. The original stock plant had hermaphrodite and female flowers and gave 39 σ : 17 σ + σ : 41 σ . The immediate parents of N. 101 and N. 102 had hermaphrodite flowers only and their offspring segregated in the ratios 30 σ : 17 σ + σ : 18 σ and 4 σ : 2 σ + σ : 9 σ . We know that only so-called "fixed" females and "fixed" hermaphrodites breed true and obviously Nos. 172 and 251 do not belong to these categories.

* Continued from K.B. 1935, 215.

Gynoecium.
Stigmata

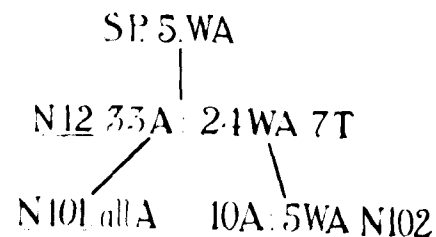


The parents and grandparent had purple stigmata but were heterozygous for this character, though in all three families the white stigmata are more numerous than coloured stigmata. N. 101 and N. 102 bred true for white immature seeds, though both families came from white seeded parents extracted from a purple seeded grandparent.

Ripe capsules. The grandparent and parents of N. 101 and N. 102 had intermediate (I II) types of capsules. In all three families most plants had I II capsules, a much smaller number II, and a still smaller number I, the exact figures being :

N. 12. 6 I : 40 I II : 19 II
N. 101. 8 I : 33 I II : 10 II
N. 102. 1 I : 9 I II : 5 II

Mature seeds. The grandparent had weak armadillo seeds and the following scheme shows the results obtained.



As always in our experience plants with armadillo seeds breed quite true for this character. It is further completely recessive to tubercled seeds when parents clearly homozygous for these characters are used, no weak armadillo or other morphologically intermediate type of seed appearing. The N. 12 ratio is 8 : 6 : 2 or 4 : 3 : 1 and the N. 102 ratio is 2 : 1.

SUMMARY.

The results obtained by selfing two individuals from a family derived by selfing a wild stock plant of *S. vulgaris* are given.

Segregation is shown to occur for medium indumentum and few hairs, for small scale, filament colour, sex, stigmata colour, capsule shape, and weak armadillo testa. Armadillo testa breeds true.

The research on which this paper is based has been aided by a Royal Society Government Grant.

XX. MISCELLANEOUS NOTES.

THE SILVER JUBILEE OF HIS MAJESTY THE KING. By command of H.M. the King, the Silver Jubilee Medal has been awarded to THE DIRECTOR, to Mr. A. D. COTTON, O.B.E., Keeper of the Herbarium and Library, and to Mr. J. T. HAZEL, Ganger in the Alpine and Herbaceous Department, who has been in the employment of the Royal Botanic Gardens for nearly 38 years.

SIR DAVID PRAIN. We record with pleasure that the Council of the Linnean Society has awarded the Linnean Gold Medal for 1935 to Sir David Prain, C.M.G., F.R.S., Director of the Royal Botanic Gardens, Kew, from 1905 to 1922.

THE DIRECTOR. The Director has been elected an Honorary Member of the Orchid Circle of Ceylon, and a Corresponding Member of the Netherlands Botanical Society.

HAROLD MUSK. We record with deep regret the death of Mr. Harold Musk from Blackwater Fever in hospital at Dar-es-Salaam on April 20th. He came to Kew as a student gardener on March 24th, 1924, and left on September 26th, 1925, on being awarded a Colonial Agricultural Scholarship by the Secretary of State for the Colonies.

The first year of his Scholarship was spent at Wye Agricultural College, and during the second year he studied at the Imperial College of Tropical Agriculture, Trinidad. Before coming to Kew he had received part of his early training at the Royal Gardens, Sandringham.

On the completion of his course at Trinidad in 1928 Musk was appointed to the post of District Agricultural Officer, Tanganyika (K.B. 1928, 112), and served in that Territory until his untimely death. Harold Musk was the first Kew student gardener to be awarded one of the Colonial Agricultural Scholarships and his death at the early age of 36 is a very sad loss.

A monographic study of *Abies numidica* Lann. The species of *Abies* in Europe and the Mediterranean Region are morphologically very closely related to one another and are taxonomically difficult to define. This is particularly true of those of the Balkan Peninsula and Asia Minor.

M. Barbey has published a useful account* of the Algerian fir as it occurs in the restricted area of Mont Babor, which reaches to an altitude of 2004 m. in central Algeria. This is largely a field study of the natural conditions under which the woods are growing and is illustrated by a series of photographic plates, some very excellent. A preface by M. Guinier discusses the general problems connected with the genus *Abies* in the Mediterranean Region. Chapters in the body of the work are concerned with the relationships of *A. numidica* to other species, the ecology of the Babor forests, the insect fauna of the area, and suggestions for the administration and preservation of the woodlands.

W. B. TURRILL.

Botanical Magazine.—The first part of vol. 158 was published on February 20th, 1935. The new volume differs from previous volumes in having the plates printed on a whiter paper, which renders the colouring more vivid and accurate, and also, in some cases, in having the dissections and small figures placed in the text, instead of on the plates. This new arrangement is a distinct improvement from the artistic point of view and is also useful since the figures are placed in the text where reference is made to structural details.

The following plants are figured: *Anguloa brevibras* Rolfe (t. 9381) from Colombia; *Semiaquilegia ecalcarata* Makino & Cox (t. 9382), a native of Kansu, Shensi and Szechuan, China; *Rhododendron Roxieanum* Forrest (t. 9383), from Western China and S. E. Tibet; *Primula szechuanica* Pax (t. 9384), from W. China and S. E. Tibet; *Choananthus cyrtanthiflorus* (C. H. Wright) Rendle (t. 9385), first discovered on Mt. Ruwenzori in 1893-94 and known from the Belgian Congo and Uganda; *Medinilla gratiosa* Stapf (t. 9386), from the Malay Peninsula; *Cyananthus longiflorus* Franchet (t. 9387), discovered by Père Delavay in Yunnan and introduced by the late Mr. G. Forrest; *Rhododendron Wiltonii* Hemsl. & E. H. Wilson (t. 9388), from W. Szechuan; *Cotoneaster hebeophylla* Diels var. *monopyrena* W. W. Smith (t. 9389), a native of N.W. Yunnan; *Phlox maculata* L. × *P. paniculata* L. (t. 9390), a fine garden hybrid which flowered in the Glasnevin Botanic Garden, Dublin, and *Linearia faucicola* Levier & Leresche (t. 9391), an interesting rock garden plant from Northern Spain.

* By A. Barbey: Une Relique de la Sapinière Méditerranéenne, le mont Babor, Paris 1934. Pp. 84.

BULLETIN OF MISCELLANEOUS INFORMATION No. 5 1935 ROYAL BOTANIC GARDENS, KEW

XXI—A CLASSIFICATION OF THE CULTIVATED SORGHUMS: J. D. SNOWDEN.

A revision of the cultivated Sorghums of Tropical Africa by the late Dr. Stapf was published in Prain, Fl. Trop. Afr. 9, 104-154 (1917). The material available for that work was very inadequate and it was due to Stapf's unique knowledge of the genus that he was able to produce such an excellent classification of the species and varieties from such specimens as he had at his disposal. Unfortunately at that time he was unable to obtain access to the types of many African varieties, but he included a list of most of these at the end of his classification under "Imperfectly known species and varieties." Since that date a very large collection of these plants has been gathered together from various parts of the world, especially from Africa and Asia, among which were found many varieties hitherto unrepresented in the Kew Herbarium. It was realized that this collection could not be satisfactorily named and arranged without a revision of all the named varieties of cultivated Sorghums. This work has taken a long time to complete as there were so many specimens to be examined, numerous types to compare, and much literature to consult. An outline of the classification proposed is given below, together with descriptions of new series, species and varieties, as well as the necessary new combinations. A complete account of the revision and an enumeration of the specimens, together with historical, cultural and economic notes on the species, will be published later.

The classification here proposed mainly follows that adopted by Stapf, in recognizing the more distinct types as species and grouping under them one or more varieties which have several characters in common. It should be noted, however, as Stapf has already pointed out (l.c. 105: 1917; 955: 1934), that the groups of cultivated Sorghums must be considered on a different basis from those of the wild types, and, although binomial names have been given for practical reasons, such classification is mainly of an artificial character, which it is hoped may prove useful to those workers who are studying these plants. The species are grouped into six subseries, and the repetition of varietal names under different species is avoided, in order that those who prefer to treat the cultivated Sorghums as one large composite species, under *Sorghum vulgare* Pers., may still make good use of the arrangement of the varieties which is provided.

The writer wishes to express his thanks to various members of the Kew Herbarium Staff, and especially to Mr. C. E. Hubbard, for

their kind assistance during the preparation of this revision and also to all those botanical institutions and agricultural departments which have furnished specimens for examination. A list of these, together with those who have assisted in collecting the material, will be included in the full account of the revision.

Sorghum Moench, Meth. Pl. 207 (1794); Pers. Syn. Pl. 1, 101 (1805); Stapf in Prain, Fl. Trop. Afr. 9, 104 (1917).

The genus *Sorghum* as understood by Stapf was divided into two sections, *Eu-Sorghum* and *Sorghastrum*. The latter is sufficiently distinct to be retained as a separate genus as already described by Nash (in Britton, Mann. Fl. N.U.S. 71: 1901). It need not be further considered here as it bears no close relationship to the wild and cultivated Sorghums in Stapf's remaining section.

The section *Eu-Sorghum* Stapf (l.c. pp. 111-140, species nos. 1-27) comprises two well-marked groups of species which are separated below into distinct sections.

Sect. I. **Eu-Sorghum.**

Vaginae nodi glabri vel tenuiter pubescentes, haud barbati; paniculae rami primarii divisi (saltem inferiores); racemi laterales et terminales.

This section includes the species nos. 1-24 described by Stapf (l.c. pp. 111-137) and forms the major portion of the genus.

Sect. II. **Para-Sorghum.**

Vaginae nodi barbati (saltem superiores); paniculae rami simplices; racemi terminales; gramina spontanea.

The species of this section have probably had a different origin from those in the previous section. It contains about 8 to 10 annual and perennial species, including the following:—*Sorghum versicolor* J. N. Anderss., *S. purpureo-sericeum* Aschers. et Schweinf., *S. dimidiatum* Stapf and *S. nitidum* Pers. The area of its distribution extends from Northern Transvaal to the Sudan, through India to China, the Malayan Region and Australia. The species which have been cytologically examined differ from those in section *Eu-Sorghum* in having only 10 chromosomes.

The section **Eu-Sorghum** may be divided into two subsections as described below:—

Subsect. A. **Arundinacea.**

Gramina annua vel raro perennia sed tunc sine rhizomatibus.

This is the largest and most important of the two subsections of *Eu-Sorghum*. The chromosome number is 20 in those species which have so far been examined.

Subsect. B. **Halepensis.**

Gramina perennia spontanea, e rhizomate elongato orta.

This subsection is restricted to *Sorghum halepense* (Linn.) Pers. and possibly one or two other species. Their area of distribution extends throughout the Mediterranean Region and eastward to India. At one time *Sorghum halepense* was considered the original ancestor of the cultivated races but this is very improbable, as besides possessing rhizomes it has 40 chromosomes.

The subsection *Arundinacea* comprises two distinct series:—

Series a. **Spontanea.**

Racemi fragiles; spiculae sessiles maturae facile deciduae; caryopsides plerumque breves et inter glumas omnino inclusae; gramina spontanea.

This series embraces the species nos. 1-10 described by Stapf (l.c. pp. 111-120). They are most abundant in Tropical Africa. A few, such as *Sorghum sudanense* Stapf and *S. virgatum* Stapf, have been cultivated for fodder.

Series b. **Sativa.**

Racemi tenaces; spiculae sessiles maturae persistentes; caryopsides glumis longiores vel saltem multo expositae, raro inclusae; gramina culta.

Those species which are generally cultivated for their grain or sweet stems are all contained in this series. It is subdivided into the following subseries:—i *Drummondii*, ii *Guineënsia*, iii *Nervosa*, iv *Bicoloria*, v *Caffra*, vi *Durra*, which are dealt with below.

SUBSERIES i. **DRUMMONDII.**

Spiculae plus minusve lanceolatae, ellipticae vel oblongae, sub-anthesi plerumque duplo longiores quam latiores, latitudine maxima supra medium nunquam reperta, nunquam transverse rugosae neque circa medium depressae; glumae fere omnino coriaceae regione apicali excepta nervis plerumque obscuris; caryopsides inclusae vel fere inclusae, maturae glumis paullo longioribus arcte comprehensae; pedicelli longiusculi et graciles, plerumque 2-4 mm. longi; panicula laxa vel raro contractiuscula, haud dense compacta.

1. **S. aterrimum** Stapf in Prain, Fl. Trop. Afr. 9, 121 (1917).

(1). Var. **transiens** (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *transiens* Hack in DC. Monogr. Phan. 6, 508 (1889).

AUSTRIA: St. Polten, ex Hort. Odessa (typus in Herb. Vindob.).

(2). Var. **angustum** Snowden, var. nov.; a var. *transeunte* (Hack.) Snowden differt panicula anguste elliptica vel anguste oblonga, ramis suberectis brevibus nonnihil axi primario adpressis, lemmate superiore spiculae sessilis inermi vel raro breviter aristato, caryopside biconvexa, scutello plus minusve obscuro.

ANGLO-EGYPTIAN SUDAN: Bahr el Ghazal; Jur Ghattas, Schweinfurth 2590 (typus).

2. *S. Drummondii* (Steud.) Millspaugh et Chase, Field Columb. Mus. Publ. Bot. 3, 21 (1903); Stapf in Prain, Fl. Trop. Afr. 9, 122 (1917). *Andropogon Drummondii* Steud. Syn. Pl. Glum. 1, 393 (1854).

UNITED STATES: New Orleans, *Drummond* 588 (typus).

3. *S. nitens* (Busse et Pilger) Snowden, stat. nov. *Andropogon Sorghum* var. *nitens* Busse et Pilger in Engl. Bot. Jahrb. 32, 189 (1902). Affine *S. Drummondii* (Steud.) Stapf sed spiculis sessilibus angustioribus elliptico-lanceolatis, lemmate superiore mucronato differt.

TANGANYIKA TERRITORY: Ugogo; Nsali, Busse 1182 (typus in Herb. Berol.)

SUBSERIES ii. GUINEËNSIA.

Spiculae sessiles, pedicelli et panícula ut in subser. *Drummondii*; caryopsides maturae inter glumas plus minusve hiantes plerumque valde obviae, glumis breviores vel aequilongae vel si longiores tum plus minusve applanatae et compressae, saepe inter glumas obliquae, demum facile deciduae, raro biconvexae et infra glumam alteram vel utramque comprehensae (cf. *S. exsertum* Snowden et *S. mellitum* Snowden).

4. *S. margaritifera* Stapf in Prain, Fl. Trop. 9, 125 (1917).

(1). Var. *margaritifera* Snowden, stat. nov. *S. margaritifera* Stapf, l.c.

FRENCH GUIANA: Bilima, Chevalier 15861 (typus).

(2). Var. *ovulifera* (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *ovulifer* Hack. in DC. Monogr. Phan. 6, 510 (1889).

GAMBIA: Boteler (typus in Herb. Vindob.)

(3). Var. *tremulans* (Stapf) Snowden, comb. nov. *Sorghum guineense* Stapf var. *tremulans* Stapf, l.c. 124 (pro parte).

NORTHERN NIGERIA: Sokoto Province, Dalziel 518 (typus).

5. *S. guineense* Stapf in Prain, Fl. Trop. Afr. 9, 123: 1917 (excl. var. *tremulans* Stapf et var. *robustum* Stapf).

(1). Var. *involutum* Stapf, l.c. 124.

NORTHERN NIGERIA: Nupe, Baikie (typus).

(2). Var. *amphibolum* (Busse et Pilger) Snowden, comb. nov. *Andropogon Sorghum* var. *amphibolum* Busse et Pilger in Engl. Bot. Jahrb. 32, 184 (1902).

DAHOMÉY: Sokode, Kersting 19 (typus in Herb. Berol.)

(3). Var. *intermedium* (Busse et Pilger) Snowden, comb. nov. *Andropogon Sorghum* var. *intermedius* Busse et Pilger, l.c. 185.

DAHOMÉY: Sokode, Kersting 5 (typus in Herb. Berol.)

(4). Var. *pendulum* (Pilger) Snowden, comb. nov. *Andropogon Sorghum* var. *pendulum* Pilger in Notizbl. Bot. Gart. Berl. 4, 147 (1904).

DAHOMÉY: (Togoland), Kersting (typus in Herb. Berol.)

(5). Var. *aristatum* Snowden, var. nov.; affine var. *involutum* Stapf, sed spiculis sessilibus minusculis 5-6.5 mm. longis, arista lemmatis superioris 12-16 mm. longa, caryopsidibus plano-convexis apice acutiusculis, regione nucellari fusca differt.

ANGLO-EGYPTIAN SUDAN: Bahr el Ghazal, Punter 37 (typus).

(6). Var. *scintillans* Snowden, var. nov.; a var. *involutum* Stapf differt, spiculis sessilibus minusculis 5-6.5 mm. longis, maturis nigro-brunneis vel nigris nitentibus, lemmate superiore plerumque breviter aristato, caryopsidibus glumis multo brevioribus parvis 4-4.5 mm. longis maturis gluma altera vel utraque basin versus comprehensis.

NORTHERN NIGERIA: Ilorin road, 60 miles from Ibadan, Sampson 46 (typus).

6. *S. mellitum* Snowden, sp. nov.; affine *S. guineense* Stapf et *S. Dochna* (Forssk.) Snowden, ab illo spicularum sessilium glumae inferioris carinis angustissime alatis, caryopsidibus minus applanatis, spiculis pedicellatis persistentibus, culmis dulcibus, ab hoc spiculis sessilibus infra medium vel circa medium latioribus, caryopsidibus a spiculis sessilibus forma diversis neque glumis arcte comprehensis, pedicellis longioribus differt.

Culmi 2.5-5 m. alti, dulces. Panícula laxa vel contractiuscula, oblonga, lanceolata oblonga vel lanceolato-elliptica nonnunquam umbelliformis, 25-40 cm. longa, 8-15 cm. lata; rami parte basali excepta graciles, flexuosi et nutantes vel nonnunquam rigidiusculi, inferiores 5-25 cm. vel ultra longi. Spiculae sessiles ellipticae vel elliptico-ovatae, acutae, 5-6.5 mm. longae, usque ad 3.5 mm. latae, glabrescentes vel margines versus sparse strigillosae. Glumae aequales, coriaceae, regione apicali excepta obscure nervosae; inferior supra medium carinis angustissime alatis vel carinis obscuris scabridis. Lemmata hyalina, tenuiter ciliata; superius mucronatum vel arista usque ad 12 mm. longa praeditum. Caryopsides maturae glumis aequilongae vel paullo breviores, gluma altera vel utraque comprehensae, raro fere inclusae, 3.5-4.5 mm. longae, 2.5-3.5 mm. latae, dorso ellipticae, vel late ellipticae vel leviter obovato-ellipticae, biconvexae vel facie nonnihil applanatae, plus minusve flavae, rubrae vel brunneae. Spiculae pedicellatae lineari-lanceo-

latae vel subulatae, 4-6 mm. longae, steriles vel raro ♂, maturae persistentes, pedicellis graciliculis 2-3 mm. longis.

NORTHERN NIGERIA: Sokoto, *Frampton* per *Glendon Hill* 13 (typus).

(1). Var. **mellitum** *Snowden*, var. nov. Panicula laxa, nonnunquam umbellata; rami graciles, saepe nutantes, 10-25 cm. vel ultra longi; caryopsides 4-4.5 mm. longae, 3-3.5 mm. latae, plus minusve rubido-brunneae.

NORTHERN NIGERIA: Sokoto, *Frampton* per *Glendon Hill* 13 (typus).

(2). Var. **australe** *Snowden*, var. nov.; affine var. *mellito* *Snowden*, sed panicula contracta densiuscula, rhachi plus minusve abdita, ramis suberectis rigidiusculis 5-10 cm. longis, caryopsidibus angustiusculis 2.5-3 mm. latis, flavidis vel rubidis differt.

SOUTH AFRICA: Western Transvaal; Rustenburg, *Pretoria Div.* Bot. 28 (typus).

7. **S. conspicuum** *Snowden*, sp. nov.; affine *S. guineënsi* Stapf et *S. Roxburghii* Stapf, ab illo spicularum sessilium gluma inferiore ecarinata vel prope apicem breviter bicarinata, spiculis pedicellatis persistentibus raro deciduis, panicula plus minusve pilosa, ab hoc spiculis majoribus et angustioribus, caryopsidibus multo compressis applanatis plerumque majoribus differt.

Culmi validi, 3-4.5 m. alti, insulsi vel raro dulces. *Folia* 15-21; laminae usque ad 1 m. longae et 10 cm. latae. *Panicula* laxa vel raro nonnihil contracta, oblonga vel elliptica nonnunquam subumbellata, 20-55 cm. longa, 8-20 cm. lata; pedunculus erectus vel raro recurvus (cf. var. *orientale* *Snowden*); rami suberecti et prope basin validiusculi, ceteri graciles, patuli, flexuosi, prope basin et axillis ramulorum pubescentes vel villosi, inferiores 10-25 cm. longi vel paniculae aequilongi. *Spiculae* sessiles elliptico-lanceolatae vel ellipticae, acutae vel acuminatae, 5.5-7.5 mm. longae, 2-4.5 mm. latae, demum glabrescentes vel raro semper strigoso-hirsutae. *Glumae* aequales, coriaceae, regione apicali excepta obscure nervosae; inferior mox convexa, ecarinata vel prope apicem breviter bicarinata, carinis dentibus minutis terminatis. *Lemmata* hyalina, moderate ciliata; superius mucronatum vel plerumque arista 5-12 mm. longa praeditum. *Caryopsides* maturae inter glumas late hiantes plerumque longiores obviae, dorso ovatae vel ovato-rotundae vel rotundatae, 4-6 (raro 3.5) mm. longae, 4-5 (raro 3) mm. latae, moderate vel valde compressae, albidae, flavae vel rubrae, regione nucellari haud colorata [excl. var. *callomelan* (K. Schum.) *Snowden*]. *Spiculae pedicellatae* lineari-lanceolatae vel subulatae, ♂ vel steriles, 5-7 mm. longae, maturae persistentes vel raro deciduae [cf. var. *pilosum* *Snowden* et var. *callomelan* (K. Schum.) *Snowden*], pedicellis gracilibus 2-3 mm. longis.

TANGANYIKA TERRITORY: Rufiji District, *Wakefield* 9 (typus).

(1). Var. **conspicuum** *Snowden*, var. nov. *Panicula* laxa; rami graciles, patuli, inferiores 10-25 cm. longi vel paniculae aequilongi. *Spiculae* sessiles 6-7.5 mm. longae, 2.5-4.5 mm. latae, maturae glabrescentes; gluma inferior ecarinata vel prope apicem breviter bicarinata; lemma superius mucronatum vel arista usque ad 5 mm. longa praeditum; caryopsides 5-6 mm. longae, 4-5 mm. latae, plerumque albidae vel eburneo-flavae, nonnunquam rubrae. *Spiculae pedicellatae* persistentes.

TANGANYIKA TERRITORY: Rufiji District, *Wakefield* 9 (typus).

(2). Var. **rhodesianum** *Snowden*, var. nov.; affine var. *conspicuum* *Snowden*, sed ramis sub anthesi axi primario adpressis tandem patentibus, gluma inferiore prope apicem distincte bicarinata, carinis dentibus minutis terminatis differt.

NORTHERN RHODESIA: Mazabuka, *Moore* 43/1931 (typus).

(3). Var. **rubicundum** *Snowden*, var. nov. *Panicula* laxa; rami graciles, patentes, usque ad 25 cm. vel ultra longi, ramulis primo lucide rubido-tinctis. *Spiculae* sessiles 5.5-6.5 mm. longae, primo apice rubidae ceterum stramineae vel pallide brunneae; gluma inferior prope apicem bicarinata; lemma superius mucronatum; caryopsides 4.5-5 mm. longae, 3.5-4 mm. latae, rufae vel ferrugineae. *Spiculae pedicellatae* persistentes, primo rubido-tinctae.

SOUTH NYASALAND: *Barker* C 28/1929 (typus).

(4). Var. **validum** *Snowden*, var. nov.; a var. *rubicundo* *Snowden* differt panicula validiore, rhachi valida vel validissima, ramis basin versus validioribus et rhachi nonnihil appressis haud rubido-tinctis, spiculis pedicellatis et apicibus spicularum sessilium haud rubido-tinctis, caryopsidibus albidis vel eburneo-flavis.

NORTHERN RHODESIA: Mazabuka, *Moore* 57/29 (typus).

(5). Var. **usaramense** (*Busse et Pilger*) *Snowden*, comb. nov. *Andropogon Sorghum* var. *usaramensis* *Busse et Pilger* in *Engl. Bot. Jahrb.* 32, 184 (1902).

TANGANYIKA TERRITORY: Usaramo; Kisserawe, *Busse* 395 (typus in *Herb. Berol.*)

(6). Var. **orientale** *Snowden*, var. nov. *Panicula* laxa, lanceolata vel pyramidalis; pedunculus erectus vel recurvus; rami basi basali excepta graciles et flexuosi. *Spiculae* sessiles anguste elliptico-lanceolatae, acuminatae, 5.5-6 mm. longae, 2-3 mm. latae; glumae tenuiter coriaceae; lemma superius aristatum vel mucronatum; caryopsides 3.5-4.5 mm. longae, 3-3.5 mm. latae. *Spiculae pedicellatae* persistentes.

INDIA: Bihar & Orissa; Bhagalpur, *Alam* 6 (typus).

(7). Var. **pilosum** *Snowden*, var. nov.; affine var. *conspicuum* *Snowden*, sed spiculis sessilibus dense pilosis vel dorso glumarum

raro nonnihil glabrescentibus, lemmate superiore plerumque arista usque ad 12 mm. longa praedito raro mucronata, spiculis pedicellatis saepe deciduis, pedicellis dense ciliatis differt.

TANGANYIKA TERRITORY : Tabora District, *Dept. Agric.* 295 (typus).

(8). Var. **callomelan** (*K. Schum.*) *Snowden*, comb. nov. *Andropogon Sorghum* var. *callomelaena* K. Schum. in Engl. Pfl. Ost-Afr. B. 40 (1895).

TANGANYIKA TERRITORY : Mamboya, *Stuhlmann* 4321 (typus in Herb. Berol.).

8. **S. Roxburghii** *Stapf* in Prain, Fl. Trop. Afr. 9, 126 (1917).

(1). Var. **parvum** *Snowden*, var. nov. *Panicula* laxa vel contractiuscula, elliptico-ovata, elliptico-oblonga vel oblonga, 20–40 cm. longa, 5–15 cm. lata ; pedunculus erectus vel recurvus ; rami parte basali excepta graciles et flexuosi. *Spiculae* sessiles lanceolatae, breviter acutae, 4–5 mm. longae, 2–3 mm. latae, pilis albidis vel fulvis vel brunneis saepe dense pilosae ; gluma inferior fere omnino coriacea ; lemma superius mucronatum ; caryopsides maturae obviae vel infra glumam alteram vel utramque comprehensae, 3·5–4 mm. longae, 2·5–3·5 mm. latae. *Spiculae pedicellatae* persistentes.

BURMA : Mandalay ; Monywa, *Herb. Coll. Agric. Mandalay* 1252 (typus).

(2). Var. **fulvum** (*Hack.*) *Snowden*, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *fulvus* Hack. in DC. Monogr. Phan. 6, 512 (1889).

MADAGASCAR : Nossi-Bé, *Hildebrandt* 3219 (typus).

(3). Var. **jucundum** (*Busse et Pilger*) *Snowden*, comb. nov. *Andropogon Sorghum* var. *jucundus* Busse et Pilger in Engl. Bot. Jahrb. 32, 185 (1902).

TANGANYIKA : Ugogo ; Ilindi, *Busse* 273 (typus in Herb. Berol.).

(4). Var. **hirsutum** (*Busse et Pilger*) *Snowden*, comb. nov. *Andropogon Sorghum* var. *hirsutum* Busse et Pilger in Engl. Bot. Jahrb. 32, 185 (1901).

TANGANYIKA TERRITORY : Meatu, Ngungumavar, *Bauman* 14 (typus in Herb. Berol.).

(5). Var. **hians** *Stapf* in Prain, Fl. Trop. Afr. 9, 127 (1917).

INDIA : without precise locality, ex *Herb. Wight* 1670 (typus).

(6). Var. **nanum** *Snowden*, var. nov. ; a var. *hiantie* *Stapf* differt, culmis brevioribus usque ad 2 m. altis plerumque dulcibus, spiculis sessilibus nonnihil minoribus angustioribus 4–4·5 mm. longis et

2–2·5 mm. latis, caryopsidibus magis compressis, regione nucellari pallido- vel atro-vinaceis.

INDIA : Bihar & Orissa ; Patna, *Alam* 2 (typus).

(7). Var. **farinosum** *Snowden*, var. nov. ; affine var. *hianti* *Stapf*. sed spiculis sessilibus paullo majoribus 4–5·5 mm. longis et 2·5–4 mm. latis, caryopsidibus maturis endospermio omnino plus minusve molli farinaceo praeditis differt.

PORTUGUESE EAST AFRICA : Massangulo, *Gomes Souza* E. (typus).

(8). Var. **mutabile** *Snowden*, var. nov. ; a var. *hiantie* *Stapf* differt spiculis sessilibus majoribus 5–6 mm. longis et 2·5–3·5 mm. latis, lemmate superiore plerumque aristato vel nonnunquam mucronato, caryopsidibus paullo majoribus usque ad 4·5 mm. longis, spiculis pedicellatis saepe deciduis.

TANGANYIKA TERRITORY : Singida District, *Curry* 19 (typus).

9. **S. gambicum** *Snowden*, sp. nov. ; affine *S. guineënsi* *Stapf*, sed spiculis sessilibus minoribus saepe pilosis, gluma inferiore magis obscure bicarinata, caryopsidibus glumis multo longioribus, spiculis pedicellatis persistentibus minoribus differt.

Culmi validi, 3–6 m. alti, prope basin 2–4 cm. lati. *Folia* 15–20 ; laminae usque ad 1 m. longae et 10 cm. latae. *Panicula* laxa, elliptica vel elliptico-oblonga, 20–50 cm. longa, 5–20 cm. lata ; rami parte basali excepta graciles, saepe nutantes et subsecundi, prope basin plus minusve pilosi, superne tenuiter scabridi, inferiores usque ad 20 cm. longi. *Spiculae* sessiles anguste ellipticae, ellipticae vel elliptico-oblongae, breviter acutae, 4–5 (raro 5·5) mm. longae, 2–3·5 mm. latae, nonnihil strigoso-pilosae vel demum glabrescentes nitentes. *Glumae* aequales vel superior sub anthesi paullo longior, coriaceae ; inferior prope apicem obscure bicarinata. *Lemmata* hyalina, moderate vel dense ciliata ; superius mucronatum vel arista 6–15 mm. longa praeditum. *Caryopsides* maturae obviae, e glumis late hiantibus exsertae, 4–4·5 mm. longae, 3·25–3·75 mm. latae, dorso late ellipticae vel ovato-rotundae, compressae et applanatae vel plano-convexae, albidae vel flavae vel purpurascencinereae, regione nucellari saepe fusco-colorata. *Spiculae pedicellatae* lineares vel lineari-subulatae, steriles, 3–4 mm. longae, maturae persistentes, pedicellis 2–2·5 mm. longis.

GAMBIA : *Dept. Agric.* 11 (typus).

(1). Var. **gambicum** *Snowden*, var. nov. *Panicula* 20–40 cm. longa, 5–15 cm. lata ; rami sparsiusculi, 10–15 cm. longi. *Spiculae* sessiles plus minusve strigillosae ; lemma superius mucronatum vel breviter aristatum ; caryopsides plerumque plano-convexae, albidae, flavae, pallido- vel atro-purpurascencinereae.

GAMBIA : *Dept. Agric.* 11 (typus).

(2). Var. **celsum** Snowden, var. nov. *Panicula* 30–50 cm. longa, 10–20 cm. lata; rami dense fasciculati, inferiores 12–20 cm. longi. *Spiculae* sessiles glabrescentes vel glabrae; lemma superius arista 10–15 mm. longa praeditum; caryopsides compressae et applanatae, albidae sed regione nucellari atro-colorata.

SIERRA LEONE: Koinadugu District; north of Kabala, *Glanville* 338 (typus).

10. **S. exsertum** Snowden, sp. nov.; affine *S. guineënsi* Stapf et *S. eleganti* (Koern.) Snowden, ab illo glumis caryopside biconvexa vel leviter compressa brevioribus et plus minusve arcte appressis, ab hoc spiculis sessilibus ellipticis, caryopsidibus convexioribus, spiculis pedicellatis plerumque deciduis differt.

Panicula laxa, elliptica vel oblonga, nonnunquam subumbellata, 30–55 cm. longa, 8–20 cm. lata; rami inferne validi et suberecti, superne graciles, patuli et nutantes, inferiores 10–15 cm. longi vel paniculae fere aequilongi, prope basin pilosi, superne tenuiter scabridi. *Spiculae* sessiles ellipticae vel elliptico-oblongae, 4.5–6 mm. longae, 2.5–3.5 mm. latae, prope apicem et margines pilosiusculae vel demum glabrescentes. *Glumae* subaequales, coriaceae; inferior supra medium plus minusve bicarinata, carinis dentibus minutis nonnunquam terminatis. *Lemmata* hyalina, moderate ciliata; superius mucronatum vel arista usque ad 7 mm. vel ultra longa praeditum. *Caryopsides* maturae e glumis plus minus arcte appressis exsertae, 3.5–5.5 mm. longae, 3.5–4.5 mm. latae, dorso late ellipticae, elliptico-oblongae, vel rotundatae, albidae vel flavidae, raro purpurascenti-brunneae vel rubido-brunneae sed tunc regione nucellari fusco-colorata. *Spiculae pedicellatae* lineares vel lineari-lanceolatae vel lineari-subulatae, 3–6 mm. longae, ♂ vel steriles, deciduae vel raro persistentes, pedicellis gracilibus 2–3 mm. longis.

NORTHERN NIGERIA: Ibadan, *Farquharson* Y (typus).

(1). Var. **exsertum** Snowden, var. nov. *Panicula* subumbellata (rhachi abbreviata) vel elliptica vel oblonga (rhachi elongata gracili). *Spiculae* sessiles 4.5–5 mm. longae; lemma superius mucronatum; caryopsides e glumis arcte appressis leviter exsertae, 3.5–4.5 mm. longae, 3–3.5 mm. latae, biconvexae, albidae vel pallide flavae vel flavae. *Spiculae pedicellatae* maturae deciduae.

NORTHERN NIGERIA: Ibadan, *Farquharson* Y (typus).

(2). Var. **amplum** Snowden, var. nov.; a var. *exserto* Snowden differt paniculis robustioribus, spiculis sessilibus 5–6 mm. longis, lemmate superiore nonnunquam aristato, caryopsidibus 4.5–5.5 mm. longis 3.5–4.5 mm. latis nonnunquam inter glumas arcte comprehensis albidis vel flavis raro purpurascenti-brunneis vel rubido-brunneis sed tunc regione nucellari fusco-colorato.

NORTHERN NIGERIA: Sokoto, Emirate boundary to Gusau, *Sampson* (typus).

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SUBSERIES iii. NERVOSA.

Spiculae sessiles et panicula plus minusve ut in subser. *Drummondii*; glumae vel saltem inferior tenuiter crustaceae vel chartaceae, fere omnino vel ad medium vel raro tantum apicem versus (cf. *S. Ankolib*) striato-nerves; caryopsides glumis breviores vel aequilongae, raro longiores (cf. *S. nervosum*), omnino inclusae vel plus minusve obviae; spiculae pedicellatae maturae persistentes.

11. **S. membranaceum** Chiov. in Monogr. Rapp. Colon. Rome, No. 19, Oct. 1912, pp. 23, 24, 47. *S. papyrascens* Stapf in Prain, Fl. Trop. Afr. 9, 134 (1917).

(1). Var. **Baldratianum** Chiov. in Monogr. Rapp. Colon. Rome, No. 19, Oct. 1912, p. 47. *S. papyrascens* var. *versiculare* Stapf in Prain, Fl. Trop. Afr. 9, 134.

ERITREA: Bogos; Cheren, *Baldrati* 1 (typus in Herb. Florent.).

(2). Var. **lateritium** (Stapf) Snowden, comb. nov. *Sorghum papyrascens* var. *lateritium* Stapf in Prain, Fl. Trop. Afr. 9, 134.

ANGLO-EGYPTIAN SUDAN: Sennar Province, ex *Rubber Exhibition*, London, 1914 (typus).

(3). Var. **Ehrenbergianum** (Koern) Snowden, comb. nov. *Andropogon Sorghum* var. *Ehrenbergianus* Koern. apud Aschers. et Schweinf., in Mém. Inst. Egypt, 2, (Illustr. Fl. d'Egypt, 163: 1887).
EGYPT: near Assouan, *Ehrenberg* (typus in Herb. Berol.).

(4). Var. **firmitus** Snowden, var. nov. *Panicula* laxa, elliptico-lanceolata vel elliptico-oblonga, 20–35 cm. longa, 8–15 cm. lata; rhachis abbreviata vel elongata et gracilis; rami nisi prope basin graciles et flexuosi, 10–20 cm. longi. *Spiculae* sessiles 7–8 mm. longae, 3–4 mm. latae; glumae tenues et chartaceae vel infra medium nonnihil subcoriaceae; lemma superius mucronatum; caryopsides late ellipticae vel elliptico-ovatae, 5–5.5 mm. longae, 3.5–4 mm. latae, glumis inclusae vel partim obviae, salmoneo-coloratae vel brunneae vel rubidae. *Spiculae pedicellatae* 5–6 mm. longae, plus minusve ferrugineae, pedicellis 2–4 mm. longis.

TANGANYIKA TERRITORY: Masasi, *Dept. Agric.* 327 (typus).

(5). Var. **tenuis** Snowden, var. nov.; affine var. *firmitori* Snowden, sed spiculis sessilibus 5.5–8 mm. longis usque ad 3.5 mm. latis, glumis tenuibus et omnino papyraceis, lemmate superiore arista 7–14 mm. longa plerumque praedito, caryopsidibus anguste-ellipticis 4.5–5 mm. longis 2.5–3 mm. latis brunneis vel rubidis vel rubido-nigris, spiculis pedicellatis 5–8 mm. longis ♂ vel nonnunquam ♀, pedicellis 2–3.5 mm. longis differt.

CHINA: Manchuria, ex *Japanese-British Exhibition*, 1910, X (typus).

(6). Var. **parvigranum** Snowden, var. nov.; a var. *firmitiori* Snowden differt culmis dulcibus et succosis, spiculis sessilibus 6-7 mm. longis usque ad 3 mm. latis, lemmate superiore mucronato, caryopsidibus parvis obovato-ellipticis 3.5-4 mm. longis 2.5-3 mm. latis flavidis vel brunneo-olivaceis, spiculis pedicellatis 5-6 mm. longis ♂ vel sterilibus, pedicellis 2-3 mm. longis.

SOUTH AFRICA: Western Transvaal, ex *Dept. Agric. Pretoria, Div. Bot.* 27 (typus).

12. **S. basutorum** Snowden, sp. nov.; affine *S. membranaceo* Chiov. et *S. cafferum* Beauv., ab illo spiculis sessilibus maturis plus hiantibus, gluma superiore magis coriacea, caryopsidibus maturis magis obviis glumis aequilongis, ab hoc spiculis sessilibus oblongis vel elliptico-oblongis longioribus, gluma inferiore tenui et papyracea, lemmate superiore plerumque aristato differt.

Culmi validi, paniculam versus 1 cm. lati; basis et folia ignota. *Panicula* contracta et densiuscula, oblonga, circiter 20-30 cm. longa et 5-10 cm. lata; rami suberecti, prope basin validi, ceterum magis flexuosi, basi et axillis tomentosi vel villosi, superne scabridi, inferior 5-10 cm. longi. *Spiculae* sessiles oblongae vel elliptico-oblongae, subacutae, 6-7 mm. longae, 2.5-4 mm. latae, primo appresse pilosae, tandem glabrescentes. *Glumae* aequales; inferior tenuis et papyracea, primo dorso applanata, ad medium tenuiter striato-nervis, apicem versus anguste bicarinata; superior tenuiter coriacea. *Lemmata* hyalina, moderate vel dense ciliata; superius mucronatum vel arista usque ad 12 mm. longa saepe praeditum. *Caryopsides* maturae inter glumas appressas plus minusve aequilongas valde obviae, dorso late ellipticae vel obovato-ellipticae, 5-5.5 mm. longae, 4-4.5 mm. latae, biconvexae vel leviter compressae, albidae, eburneo-flavae, ferrugineae vel rubrae. *Spiculae pedicellatae* lineari-lanceolatae vel subulatae, 5-6 mm. longae, plerumque ♂, maturae persistentes, pedicellis 1-2 mm. longis.

SOUTH AFRICA: Basutoland; Leribe, *Dieterlen* 641a (typus).

13. **S. nervosum** Bess. ex Schult in Roem et Schult. *Syst. Veg.* 2, Mant. 669 (1827).

(1). Var. **nervosum** (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *nervosus* Hack. in DC. Monogr. Phan. 6, 513 (1889).

CHINA: Woopung (typus in Herb. Haum.).

(2). Var. **flexibile** Snowden, var. nov. *Panicula* nisi prope basin laxa, corymbiformis vel subumbelliformis, 25-40 cm. longa, 10-20 cm. lata; rhachi abbreviata vel elongata et tunc superne gracillima; rami suberecti, validiusculi, basin versus appressi, ceterum graciles et patentes, inferiores paniculam aequantes vel dimidium ejus superantes. *Spiculae* sessiles ellipticae vel elliptico-oblongae, acutae vel subobtusae, 4-5 mm. longae, 2.25-3.5 mm.

latae, fere glabrae; gluma inferior papyracea, valde striato-nervis; superior coriacea; lemma superius mucronatum vel aristatum; caryopsides maturae glumis aequilongae vel paullo longiores, valde obviae, dorso ellipticae vel obovato-ellipticae, 3.5-5.5 mm. longae, 2.5-4 mm. latae, biconvexae vel plano-convexae, albidae, eburneo-flavae, brunneae vel rubrae. *Spiculae pedicellatae* 3-6 mm. longae, ♂ vel steriles, persistentes, pedicellis 1-2.5 mm. longis.

CHINA: Manchuria, ex *Japanese-British Exhibition, 1910*, H (typus).

14. **S. melaleucum** Stapf in Prain, *Fl. Trop. Afr.* 9, 134 (1917).

ANGLO-EGYPTIAN SUDAN: without precise locality, ex *Rubber Exhibition, London, 1914* (typus).

15. **S. ankolib** Stapf in Prain, *Fl. Trop. Afr.* 9, 135 (1917).

(1). Var. **ankolib** (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *ankolib* Hack. in DC. Monogr. Phan. 6, 519 (1889).

ANGLO-EGYPTIAN SUDAN: Gallabat, *Schweinfurth* 1530 (typus).

(2). Var. **glaberrimum** (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *glaberrimus* Hack., l.c. 512.

ANGLO-EGYPTIAN SUDAN: Sennar, *Wurtemberg* (typus in Herb. Vindob.).

16. **S. splendidum** (Hack.) Snowden, stat. nov.; *Andropogon Sorghum* subsp. *sativus* var. *splendidus* Hack., in DC. Monogr. Phan. 6, 510 (1889). Affine *S. membranaceo* Chiov. et *S. Dochna* (Forsk.) Snowden, ab illo panicula glabriore, glumis spicularum sessilium durioribus et magis crustaceis, pedicellis longioribus gracilioribus, caryopsidibus plerumque inclusis, ab hoc spiculis sessilibus majoribus ad medium vel infra medium latioribus, caryopsidibus plerumque inclusis glumis brevioribus, pedicellis gracilioribus longioribus differt.

Culmi robusti, usque ad 2 m. vel ultra alti, prope basin 1-2 cm. lati. *Folia* numerosa; laminae summae usque ad 50 cm. longae, 2-6 cm. latae. *Panicula* laxa, lanceolata vel elliptico-lanceolata vel elliptico-oblonga, usque ad 40 cm. longa et 15 cm. lata; rami suberecti, prope basin validiusculi, ceterum graciles, flexuosi et patentes, ut ramuli scabridi, ceterum fere glabri, inferiores 10-25 cm. longi. *Spiculae* sessiles elliptico-lanceolatae, oblongo-lanceolatae, elliptico-oblongae vel ellipticae, acutae vel acuminatae, 6-11 mm. longae, 2.5-4.5 mm. latae, glabrae vel sparse pilosae, tandem nitentes. *Glumae* aequales, tenuiter crustaceae, apicibus nonnihil papyraceis; inferior supra medium tenuiter striato-nervis, triente superiore bicarinata, carinis scabridis; superior supra medium carinata. *Lemmata* hyalina, moderate ciliata; superius arista 12-18 mm. longa praeditum vel raro arista multo redacta et inter glumas

inclusa. *Caryopsides* maturae inter glumas inclusae vel fere inclusae, 4-5 mm. longae, 2.5-3.5 mm. latae, dorso obovatae vel obovato-ellipticae, biconvexae vel prope basin leviter compressae, eburneo-flavae, flavae vel rufae. *Spiculae pedicellatae* lineari-lanceolatae vel elliptico-lanceolatae, 5-10 mm. longae vel saepe multo redactae, steriles vel raro ♂, maturae persistentes, pedicellis 1.5-4 mm. longis.

HAWAIIAN ISLANDS: Oahu Island; Honolulu, *Wawra* (typus).

(1). Var. **splendidum** (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *splendidus* Hack. l.c.

HAWAIIAN ISLANDS: Oahu Island; Honolulu, *Wawra* (typus in Herb. Vindob.).

(2). Var. **magnum** Snowden, var. nov. *Spiculae sessiles* elliptico-lanceolatae vel elliptico-oblongae, 8-11 mm. longae, 3.5-4.5 mm. latae; lemma superius aristatum; caryopsides maturae inter glumas inclusae, dorso obovatae, 5-5.5 mm. longae, 3.5-4 mm. latae.

SIAM: Seiracha, introduced from Rayong, *Collins* 1402 (typus).

(3). Var. **ellipticum** Snowden, var. nov.; affine var. *magno* Snowden, sed spiculis sessilibus brevioribus ellipticis vel elliptico-oblongis 7.5-8 mm. longis, arista lemmatis superioris saepe multo redacta et inter glumas nonnunquam inclusa differt.

PHILIPPINE ISLANDS: Central Luzon, *Loher* 5167! Without precise locality, *Loher* 7126 (typus).

SUBSERIES IV. BICOLORIA.

Panicula plus minus ut in subser. *Drummondii*; spiculae sessiles obovatae, obovato-ellipticae vel obovato-oblongae, sub anthesi raro ellipticae vel elliptico-oblongae sed tunc maturae leviter obovato-ellipticae vel obovato-oblongae; glumae coriaceae, nisi prope apicem obscure nervosae vel raro crustaceae et nonnihil striato-nerves (cf. *S. Dochna*); caryopsides maturae plerumque plus minusve obviae sed tunc inter glumas arcte comprehensae, raro inclusae; spiculae pedicellatae persistentes (eis *S. notabilis* exceptis); pedicelli plerumque breves, 0.5-2 mm. longi (sed, cf. *S. Dochna* et *S. notabile*).

17. **S. dochna** (Forsk.) Snowden comb. nov. *Holcus dochna* Forsk. Fl. Aegypt-Arab. 174 (1775). *Andropogon Sorghum* var. *saccharatus* Koern. in Handb. Getreideb. 1, 310: 1873 (pro parte).*

EGYPT: (Rosetta) Cultivated, *Forsskaal* (typus 108 in Herb. Forsk., in Herb. Mus. Haun.).

*The species which Linnaeus described under *Holcus* will be discussed elsewhere, but it is necessary to mention that in the second edition of his Sp. Pl. 1484 (1763) Linnaeus completely changed the diagnosis of his *Holcus saccharatus* and it is deemed inadvisable to use the name here (see Stapf in Kew Bull. 1919, 25).

(1). Var. **pulchrum** (Burkill) Snowden, comb. nov. *Andropogon Sorghum* var. *pulcher* Burkill ex Benson et Subba Rao, Madras Dept. Agric. Bull. No. 55, 67: 1906 (pro parte).

BURMA: Sagaing, ex *Herb. Rep. Econ. Prod. India* 11793a (typus).

(2). Var. **atrum** Snowden, var. nov. *Panicula laxa* vel contractiuscula et densa, elliptica, elliptico-oblonga vel oblonga, 15-30 cm. longa, 5-12 cm. lata; pedunculus erectus vel recurvus; rami suberecti, nisi prope basin graciles, inferiores 5-10 cm. longae. *Spiculae sessiles* ellipticae vel aliquantulum obovato-ellipticae, subobtusae vel acutae, 4.5-5.5 mm. longae, 2-3.5 mm. latae, demum glabrescentes, plerumque brunnea evel atro-coloratae; glumae sub anthesi nonnihil papyraceae, tandem tenuiter crustaceae; gluma inferior triente superiore tenuiter striato-nervis; lemma superius plerumque arista longa praeditum. *Caryopsides* inter glumas appressas fere inclusae vel maturae apice leviter obviae, tenuiter obovato-ellipticae vel obovato-oblongae, 4-4.5 mm. longae, 2.5-3 mm. latae, biconvexae, albidae vel brunneae. *Spiculae pedicellatae* 3-5 mm. longae, persistentes, pedicellis brevibus 0.5-1.5 mm. longis.

BURMA: Sagaing, ex *Herb. Rep. Econ. Prod. India* 11795a (typus).

(3). Var. **burmanicum** (Burkill) Snowden, comb. nov. *Andropogon Sorghum* var. *burmanicus* Burkill ex Benson et Subba Rao, l.c.

BURMA: Sagaing, *Herb. Rep. Econ. Prod. India* 11792a (typus).

(4). Var. **corymbosum** (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *corymbosus* Hack. in DC. Monogr. Phan. 6, 513 (1889).

JAMAICA: cultivated in the Botanic Gardens 1857, ex *Herb. A. Braun* (typus in Herb. Berol.).

(5). Var. **technicum** (Koern.) Snowden, comb. nov. *Andropogon Sorghum* var. *technicus* Koern. in Syst. Uebers. 20 (1873); Handb. Getreideb. 1, 308 (1885).

(6). Var. **obovatum** (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *obovatus* Hack. in DC. Monogr. Phan. 6, 514: 1889 (pro parte, excl. subv. *niger*). *Andropogon Sorghum* var. *Dochna* Christensen in Dansk. Bot. Arkiv. 4, No. 3, 29 (1922).

(7). Var. **irungu** (Burkill) Snowden, comb. nov. *Andropogon Sorghum* var. *irungu* Burkill ex Benson et Subba Rao, Madras Dept. Agric. Bull. No. 55, 67 (1906).

INDIA: Madras; Madura, ex *Herb. Rep. Econ. Prod. India* 15616 (typus).

(8). Var. **formosum** Snowden, var. nov. *Panicula laxa*, elliptica vel oblonga, 20-45 cm. longa, 5-10 cm. lata; rami suberecti, nisi prope basin graciles et flexuosi, inferiores 10-20 cm. longi. *Spiculae*

sessiles ellipticae vel nonnihil obovato-ellipticae, subacutae, 4.5–5.5 mm. longae, 2.5–3 mm. latae, apicibus saepe perpetuo pilosae; glumae tenuiter coriacea vel crustacea; gluma inferior triente superiore obscure striato-nervis; lemma superius mucronatum vel aristatum. *Caryopsides* maturae omnino inclusae vel apice leviter obviae sed glumas arcte appressas haud superantes, ambitu spiculis sessilibus similes, biconvexae, saepe brunneae vel rubellae. *Spiculae pedicellatae* persistentes, pedicellis subgracilibus 1–2 mm. longis.

EGYPT: Behera Province; Acricha, *Dudgeon* (typus).

(9). Var. **Wightii** (Hack.) *Snowden*, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *Wightii* Hack. in DC. Monogr. Phan. 6, 511 (1889).

INDIA: Without precise locality, *Herb. Wight propr.* 185 (typus in Herb. Berol.).

(10). Var. **melliferum** *Snowden* var. nov.; affine var. *formoso* *Snowden*, a quo recedit spiculis sessilibus aliquantum latioribus 3–3.5 mm. latis demum glabrescentibus vel nitentibus plerumque nigris, caryopside matura inter glumas appressas subocculta apice tantum superneque lateribus obvia 4–5 mm. longa 3–3.5 mm. lata albida flavida brunnea vel rubida, pedicellis validiusculis 0.5–1.5 mm. longis.

INDIA: Madras; Tinnevely, etc. *Anstead* 3 (typus).

18. **S. bicolor** (Linn.) *Moench*, Meth. Pl. 207 (1794).

(1). Var. **bicolor** (Pers.) *Snowden*, comb. nov. *Holcus bicolor* Linn. Mant. 301 (1771); *Sorghum vulgare* var. *bicolor* Pers. Syn. 101 (1805).

(2). Var. **Arduini** (Koern.) *Snowden*, comb. nov. *Holcus Arduini* Gmel. Syst. Nat. 2, 174 (1791); *Andropogon Sorghum* var. *Arduini* Koern., Handb. Getreideb. 1, 312: 1885 (pro parte).

(3). Var. **pilcigutta** *Snowden* var. nov. *Panicula* laxa vel contractiuscula et densa, oblonga vel obovata, 12–25 cm. longa, 5–10 cm. lata; pedunculus nonnunquam recurvus; rami suberecti, inferne validiusculi, superne graciles et nonnihil patentes, inferiores usque ad 10 cm. longi. *Spiculae* sessiles obovatae vel obovato-rotundae, apice lato nonnihil depresso, 4.5–5.5 mm. longae, 3–4 mm. latae, demum nigro-brunneae vel nigrae, nisi prope apicem glabrae et nitentes; lemma superius plerumque aristatum sed arista nonnunquam redacta; arista cum lemmate decidua. *Caryopsides* maturae omnino inclusae vel apice inter glumas arcte appressas leviter obviae, dorso ellipticae vel obovato-ellipticae vel subrotundae, biconvexae, flavido-brunneae, brunneae vel rubrae. *Spiculae pedicellatae* plerumque multo redactae, tandem e pedicellis gracilibus saepe defractae.

BURMA: Rangoon, *McClelland* (typus).

(4). Var. **Charisianum** (Busse et Pilger) *Snowden*, comb. nov. *Andropogon Sorghum* var. *Charisianus* Busse et Pilger in Engl. Bot. Jahrb. 32, 187: 1902 (pro parte).

TANGANYIKA TERRITORY: Usambara, *Holst* (typus in Herb. Berol.).

(5). Var. **subglobosum** (Hack.) *Snowden*, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *subglobosus* Hack. in DC. Monogr. Phan. 6, 515 (1889).

HAWAIIAN ISLANDS: Honolulu, in garden, *Wawra* (typus in Herb. Vindob.).

19. **S. miliiforme** (Hack.) *Snowden*, stat. nov. *Andropogon Sorghum* subsp. *sativus* var. *miliiformis* Hack. in DC. Monogr. Phan. 6, 518 (1889). Affine *S. bicolori* Moench et *S. caudato* Stapf, ab illo spiculis sessilibus multo minoribus, longitudine latitudinem fere aequante, lemmate superiore mucronato vel breviter aristato (arista usque ad 3 mm. longa), panicula pilosiore, ab hoc spiculis sessilibus magis obovato-rotundis, gluma inferiore apice depressa, caryopsidibus subglobosis differt.

INDIA: Sikkim; *Hooker & Thomson* (typus).

(1). Var. **miliiforme** (Hack.) *Snowden*, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *miliiformis* Hack., l.c.

INDIA: Sikkim; *Hooker & Thomson* (typus).

(2). Var. **rotundulum** *Snowden*, var. nov.; affine var. *miliiformi* (Hack.) *Snowden*, sed panicula magis contracta et nonnihil densa anguste oblonga vel lanceolato-oblonga 4–7 cm. lata, rhachis plus minusve abscondita, ramis brevioribus et rigidioribus inferioribus plerumque 5 cm. haud attingentibus differt.

INDIA: Bihar & Orissa; Bhagalpur, *Alam* 9 (typus).

(3). Var. **sikkimense** *Snowden*, var. nov.; affine var. *miliiforme* (Hack.) *Snowden*, sed panicula majore ovata vel elliptico-ovata 30–35 cm. longa 15–20 cm. lata, ramis inferioribus 10–20 cm. longis, caryopsidibus majoribus plerumque 4 mm. longis et latis differt.

INDIA: Sikkim; *Tukvar, Gamble* 3354a (typus).

20. **S. simulans** *Snowden*, sp. nov.; affine *S. bicolori* Moench et *S. caudato* Stapf, ab illo gluma inferiore spicularum sessilium obscure bicarinata apice glabra, lemmate superiore mucronato, caryopsidibus plano-convexis acutiusculis multo obviis, ab hoc spiculis sessilibus magis obovatis, gluma inferiore apice depressa, caryopsidibus inter glumas subaequales arcte comprehensis differt.

Culmi validi, usque ad 3 m. alti et prope basin 2 cm. lati, plerum-

que dulci et succosi. *Folia* 16 vel ultra ; laminae usque ad 80 cm. longae et 8 cm. latae. *Panicula* laxa vel contractiuscula, ovata vel elliptica, nonnunquam corymbiformis, 15–30 cm. longa, 10–15 cm. lata ; pedunculus erectus vel raro recurvus ; rhachis abbreviata vel raro elongata et gracilis ; rami nisi prope basin graciles et flexuosi, prope basin et in axillis ramificationum tomentosi vel villosi, ceterum fere glabri lavesque, superiores plerumque longiores, dimidium paniculae aequantes vel superantes. *Spiculae* sessiles obovato-oblongae vel obovatae, apice longiusculo subacuto vel obtuso plus minusve depresso, 4–5 mm. longae, sub anthesi 2.5–3 mm. latae, maturae obovato-rotundae et 3.5–4 mm. latae. *Glumae* aequales vel superior sub anthesi inferiore paullo longior, coriaceae ; inferior ecarinata vel prope apicem obscure et breviter bicarinata. *Lemmata* hyalina, sparse vel moderate ciliata ; superius mucrone 0.5–2 mm. longo praeditum. *Caryopsides* maturae dimidio superiore inter glumas subaequales arcte appressas obviae, dorso ellipticae, apice acutiusculae, plano-convexae, 4–4.5 mm. longae, 3–3.5 mm. latae, flavido-brunneae vel brunneae, rubrae vel nigro-rubrae. *Spiculae pedicellatae* lineari-lanceolatae, 3–4.5 mm. longae, steriles, persistentes, pedicellis 1–2 mm. longis.

NYASALAND : southern area, *Barker* 4/1927 (typus).

21. *S. elegans* (Koern.) Snowden, stat. nov. *Andropogon Sorghum* var. *elegans* Koern. in Baumann, Usambara, 318 (1891) ; K. Schum. in Engl. Pfl. Ost-Afr. B.40 (1895) ; affine *S. bicolori* Moench et *S. simulanti* Snowden, caryopside multum compressa plerumque valde magna et glumis plerumque multo longiore, apice glumae inferioris non distincte depresso, ramis paniculae gracillimis, etiam a *S. bicolori* Moench spiculis sessilibus plerumque muticis differt.

TANGANYIKA TERRITORY : North Usegua, *Baumann* 1a (typus in Herb. Berol.).

(1). Var. *elegans* (Koern.) Snowden, comb. nov. *Andropogon Sorghum* var. *elegans* Koern. l.c.

(2). Var. *Schumannii* (Busse et Pilger) Snowden, comb. nov. *Andropogon Sorghum* var. *Schumannii* Busse et Pilger in Engl. Bot. Jahrb. 32, 186 : 1902 (pro parte).

TANGANYIKA TERRITORY : Uluguru ; Kiroka, *Busse* 1161 (typus in Herb. Berol.).

(3). Var. *togoënsis* Snowden, var. nov. ; a var. *elegante* (Koern.) Snowden differt rhachi paniculae plerumque continua, caryopsidibus dorso late ovatis vel orbicularibus albidis flavidis, cinereis vel rubris, scutello longiore duas partes caryopsides aequante.

DAHOMEY : (Togoland), *Kersting* (Kabure-sortes 15, typus in Herb. Berol.).

(4). Var. *Ziegleri* (Busse et Pilger) Snowden, comb. nov. *Andropogon Sorghum* var. *Ziegleri* Busse et Pilger in Engl. Bot. Jahrb. 32, 186 (1902).

TANGANYIKA TERRITORY : Usagara ; Sedia, *Busse* 1237 (typus in Herb. Berol.).

(5). Var. *Holstii* (Busse et Pilger) Snowden, var. nov. ; *Andropogon Sorghum* var. *Charisianus* subv. *Holstii* Busse et Pilger in Engl. Bot. Jahrb. 32, 187 : 1902 (pro parte).—affine var. *Ziegleri* (Busse et Pilger) Snowden, sed ramulis et spiculis pedicellatis et apice spicularum sessilium primo rubello-tinctis, caryopsidibus salmoneo-coloratis vel rufis vel ferrugineis differt.

TANGANYIKA TERRITORY : Usambara ; *Holst* (typus in Herb. Berol.).

Vern. name : *Kikaratta*.

(6). Var. *Baumannii* (Koern.) Snowden, comb. nov. *Andropogon Sorghum* var. *Baumannii* Koern. in Baumann, Usambara, 318 (1891).

TANGANYIKA TERRITORY : North Usegua, *Baumann* 28 (typus in Herb. Berol.).

22. *S. notabile* Snowden, sp. nov. ; affine *S. guineënsi* Stapf et *S. eleganti* (Koern.) Snowden, ab illo spiculis sessilibus maturis obovato-ellipticis vel obovato-oblongis, caryopside inter glumas arcte comprehensa glumis plerumque multo longiore, ab hoc spiculis sessilibus minus obovatis, spiculis pedicellatis plerumque deciduis, pedicellis longioribus differt.

Culmi validi, 3–4 m. alti, prope basin 2–4 cm. lati. *Folia* 20–30 ; laminae usque 80 cm. vel ultra longae et 7.5 cm. latae. *Panicula* laxa, elliptico-oblonga, lanceolato-oblonga, oblonga vel obovato-elliptica, plerumque umbellata, 20–50 cm. longa, 5–12 cm. lata ; rhachis continua et superne gracilis vel valde abbreviata, nisi prope nodos sparse pilosa vel fere glabra ; rami suberecti, prope basin validiusculi, ceterum graciles vel gracillimi et flexuosi, pilis paucis prope basin et in axillis ramulorum exceptis fere glabri, superne plus minusve scabridi, inferiores 10–20 cm. longi vel paniculae aequilongi, prope basin per 2–10 (raro 20) cm. saepe espiculati. *Spiculae* sessiles ellipticae vel elliptico-oblongae vel leviter obovato-ellipticae vel anguste obovato-oblongae, acutae, 4–5.5 mm. longae, sub anthesi 2–3 mm. latae, maturae magis obovato-ellipticae vel obovato-oblongae et usque ad 4 mm. latae, glabrae vel fere glabrae, tandem nitentes et saepe nigro-brunneae vel nigrae ; callus sparse barbatus vel glaber. *Glumae* aequales, coriaceae ; inferior tertia parte superiore obscure bicarinata. *Lemmata* hyalina, tenuiter vel moderate ciliata ; superius mucronatum. *Caryopsides* maturae glumas arcte appressas valde superantes vel raro fere aequantes, 5–6.5 mm. longae, 3–4.5 mm. latae, dorso ellipticae, obovato-ellipticae vel obovatae, plano-convexae, plerumque valde compressae,

albidae, cinereae vel rubidae, regione nucellari fusco-colorata. *Spiculae pedicellatae* lineari-lanceolatae, 3-5 mm. longae, steriles, deciduae vel maturae raro persistentes, pedicellis gracilibus, 1-3 mm. longis.

NORTHERN NIGERIA : Zaria, *Glendon Hill* K (typus).

(1). Var. **notabile** *Snowden*, var. nov. *Panicula* laxa, obovato-elliptica, saepe umbellata, 30-45 cm. longa, 8-12 cm. lata; rhachis plerumque abbreviata, 8-16 cm. longa; rami suberecti, prope basin appressi et validiusculi, 20-35 cm. longi, saepe prope basin per 10-20 cm. simplices et espiculati. *Spiculae sessiles* 4-5 mm. longae, 2-3 mm. latae; caryopsides maturae glumis multo longiores, 5-6 mm. longae, 3.5-4 mm. latae, dorso ellipticae, apicem et basin versus angustatae, plano-convexae, valde compressae, rubidae. *Spiculae pedicellatae* maturae deciduae.

NORTHERN NIGERIA : Zaria, *Glendon Hill* K (typus).

(2). Var. **planogranum** *Snowden*, var. nov.; a var. *notabili* *Snowden* differt panicula elliptica lanceolato-oblonga vel oblonga 25-35 cm. longa, rhachi plerumque continua, ramis inferioribus 10-18 cm. longis prope basin per 3-8 cm. espiculatis, spiculis sessilibus usque ad 3.5 mm. latis, caryopsidibus 5-6.5 mm. longis 3-3.5 mm. latis albidis vel cinereis spiculis pedicellatis maturis persistentibus.

ANGLO-EGYPTIAN SUDAN. Bahr El Ghazal, *Punter* 39 (typus).

(3). Var. **nigrescens** *Snowden*, var. nov.; affine var. *plano-grano* *Snowden*, sed spiculis sessilibus paullo longioribus 4.5-5.5 mm. longis, caryopside glumis subaequali vel paullo longiore dorso obovata leviter compressa pallide rubra vel atro-rubra, spiculis pedicellatis maturis deciduis differt.

ANGLO-EGYPTIAN SUDAN : Nuba Mountains, *Punter* 91 (typus).

SUBSERIES V. CAFFRA.

Spiculae sessiles ovatae, ellipticae, elliptico-oblongae, obovato-ellipticae vel obovato-oblongae, sub anthesi longitudine latitudinem saepe haud multo superante, maturae apertae trientem usque dimidium caryopsidis exhibentes; caryopsides glumis plus minusve appressis aequilongae vel plerumque multo longiores; panicula contracta et densa, vel compacta, nonnunquam laxior sed tunc rhachi ramis et ramulis pilosis vel villosis; pedicelli breves, plerumque 0.5-2 mm. longi (sed cf. *S. coriaceum* *Snowden* et *S. caudatum* Stapf).

23. ***S. coriaceum*** *Snowden*, sp. nov.; a *S. conspicuo* *Snowden* et *S. Roxburghii* Stapf spiculis sessilibus late ellipticis, caryopside biconvexa vel planoconvexa glumis longiore, panicula saepe densissima differt, a *S. caffrorum* Beauv. spiculis sessilibus saepe longi-

oribus ellipticis, glumis valde coriaceis, lemmate superiore plerumque longe aristato, caryopside inter glumas minus arcte comprehensa differt.

Culmi validi, 2-3.5 m. alti, prope basin 2-3 cm. lati, insulsi vel raro dulces. *Folia* numerosa; laminae 0.6-1 m. longae, 8-12 cm. latae. *Panicula* densissima et cylindrica vel minus densa et ambitu oblonga vel elliptico-oblonga, vel raro laxa et nonnunquam subumbellata, 15-40 cm. longa, 5-12 (raro 20) cm. lata; rhachis continua vel raro abbreviata, prope basin et nodos dense villosi; rami prope basin validi et suberecti, ceterum graciliores et flexuosi, appressi vel tandem patentes, prope basin et axillis ramulorum villosi, ut ramuli superne scabridi, inferiores 5-15 cm. longi vel paniculae aequilongi. *Spiculae sessiles* late ellipticae (raro elliptico-rotundae), acutae vel subobtusae, 4-6 (raro 6.5) mm. longae, sub anthesi 2.5-3.5 mm. latae, maturae tandem elliptico-ovatae et 3.5-4.5 mm. latae, strigoso-hirsutae vel demum dorso glumarum glabrescentes; callus dense barbatus. *Glumae* aequales, crassae et coriaceae; inferior breviter et plerumque distincte bicarinata, apice nonnunquam distincte tridentata. *Lemmata* hyalina, moderate vel dense ciliata; superius plerumque arista 9-12 mm. longa praeditum vel nonnunquam mucronatum. *Caryopsides* maturae glumis longiores, valde obviae et inter glumas nonnunquam obliquiter versae, 4.5-6 mm. longae, 4-4.5 mm. latae, dorso ovatae, late ellipticae vel orbiculares, biconvexae vel leviter compressae, albidae, flavidae, brunneae vel rubidae, regione nucellari nonnunquam fusco-colorata. *Spiculae pedicellatae* lineari-lanceolatae vel elliptico-lanceolatae, 4-5 mm. longae, plerumque steriles, maturae persistentes (nisi in var. *tanganika* *Snowden*), pedicellis 1.5-2.5 mm. longis, dense ciliatis.

NORTHERN RHODESIA : Mumbwa, cultivated at Mazabuka, *Moore* 63/1931 (typus).

(1). Var. **coriaceum** *Snowden*, var. nov. *Panicula* (saltem sub anthesi) contracta et densa, elliptica vel oblonga, nonnunquam cylindrica, 20-40 cm. longa, 5-12 cm. lata; rhachis continua, valida; rami suberecti, prope basin validi et rigidi, ceterum graciliores et flexuosi, inferiores usque ad 10 (raro 15) cm. longi, prope basin divisi. *Spiculae sessiles* late ellipticae, 4.5-5.5 mm. longae, maturae usque ad 4.5 mm. latae; gluma inferiore distincte bicarinata et apice plus minusve tridentata; lemma superius aristatum vel nonnunquam mucronatum; caryopsides maturae glumis appressis vel leviter involutis longiores, 4.5-5.5 mm. longae, 3-4.5 mm. latae, dorso late ellipticae vel orbiculares, biconvexae, albidae, flavidae, rubidae vel brunneae. *Spiculae pedicellatae* maturae persistentes.

NORTHERN RHODESIA : Mumbwa, cultivated at Mazabuka, *Moore* 63/1931 (typus).

(2). Var. **brevigluma** *Snowden*, var. nov.; affine var. *coriaceo* *Snowden*, sed panicula plus minusve cylindrica, spiculis sessilibus

brevioribus late ellipticis vel elliptico-rotundis 4-4.5 mm. longis differt.

NORTHERN RHODESIA : Mazabuka, *Moore* 36/1931 (typus).

(3). Var. **subinvolutum** *Snowden*, var. nov., a var. *coriaceo* *Snowden* differt spiculis paullo majoribus, 5-6 (raro 6.5) mm. longis, gluma inferiore ecarinata vel obscure bicarinata et apice haud distincte 3-dentata, caryopside matura inter glumas plus minusve involutas saepe obliquiter versa.

NORTHERN RHODESIA : Mazabuka, *Moore* 39/1931 (typus).

(4). Var. **lualabicum** *Snowden*, var. nov. *Panicula* contracta, densa vel laxiuscula, lanceolato-oblonga vel elliptico-oblonga vel oblonga, 15-30 cm. longa, 5-10 cm. lata; rhachis continua vel raro brevis; rami prope basin validiusculi, ceterum graciliores et flexuosi, 5-15 cm. longi. *Spiculae sessiles* ellipticae, 4.5-5 mm. longae, maturae usque ad 3.5 mm. latae; gluma inferior distincte bicarinata et apice plus minusve 3-dentata; lemma superius plerumque aristatum: caryopsides maturae inter glumas nonnihil breviores saepe obliquiter versae, 4-5 mm. longae, 3-4 mm. latae, eburneo-flavae, vel raro brunneae vel rubrae. *Spiculae pedicellatae* maturae persistentes.

BELGIAN CONGO : Lualaba, Yadotville—Kamatanda, *Vermeiren* 2 (typus).

(5). Var. **tanganyikae** *Snowden*, var. nov.; affine var. *coriaceo* *Snowden*, a quo rhachi paniculae nonnunquam abbreviata, gluma inferiore spiculae sessilis obscure vel distincte bicarinata, caryopsidibus paullo minoribus 4-5 mm. longis 3.5-4 mm. latis, spiculis pedicellatis maturis plerumque deciduis differt.

TANGANYIKA TERRITORY : Mwanza District, *Dept. Agric.* 116 (typus).

(6). Var. **umbelliforme** *Snowden*, var. nov. *Panicula* laxa, plus minusve umbellata, 25-35 cm. longa, 8-20 cm. lata; rhachis fere obsoleta vel brevissima; rami basi excepta graciles et patentes, 10-20 cm. longi vel paniculae fere aequilongi. *Spiculae sessiles* 4.5-5.5 mm. longae, maturae usque ad 4 mm. latae; gluma inferior obscure bicarinata et apice non distincte 3-dentata; lemma superius mucronatum vel arista brevi praeditum; caryopsides maturae inter glumas breviores saepe obliquiter versae, dorso ovatae vel late ellipticae vel orbiculares, albidae, flavidae vel rubidae. *Spiculae pedicellatae* maturae persistentes.

NORTHERN RHODESIA : Mazabuka, *Moore* 52/1929 (typus).

24. *Sorghum caffrorum* *Beauv.* *Agrost.* 131, 178 (1812); *Stapf* in *Prain Fl. Trop. Afr.* 9, 130 (1917).

(1). Var. **albofuscum** (*Koern.*) *Snowden*, comb. nov. *Andropogon Sorghum* var. *albofuscus* *Koern.* in *Baumann, Massailand*, 295 (1894).

TANGANYIKA TERRITORY : Karagwe; West Usui, *Baumann* 13 (typus in *Herb. Berol.*).

(2). Var. **albidum** (*Koern.*) *Snowden*, comb. nov. *Andropogon Sorghum* var. *albidus* *Koern.* in *Bull. Herb. Boiss.* 2, 226: March 1894 (non *Koern.* in *Bull. Herb. Bois.* 2, App. 2, 12: 1894, vel in *Baumann, Massailand*, 295: 1894).

SOUTH WEST AFRICA : Ovamboland; Ondonga, Olukonda, *Schinz* (typus).

(3). Var. **cinereum** *Snowden*, var. nov.; affine var. *albido* (*Koern.*) *Snowden*, a quo caryopsidibus cinerascentibus regione mucellari fusco-colorata differt.

SOUTH ANGOLA : Without precise locality, *Pearson* 123a (typus).

(4). Var. **ondongae** (*Koern.*) *Snowden*, comb. nov. *Andropogon Sorghum* var. *ondongae* *Koern.* in *Baumann, Usambara*, 319: 1891 (pro parte; excl. *Baumann's spec.*).

SOUTH WEST AFRICA : Ovamboland; Ondonga, Olukonda, *Schinz* (typus).

(5). Var. **lasiorhachis** (*Hack.*) *Snowden*, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *lasiorhachis* *Hack.* in *DC. Monogr. Phan.* 6, 513 (1889).

GERMANY : ex *Hort. Bot. Berol.* (typus in *Herb. Berol.*).

(6). Var. **brunneolum** *Snowden*, var. nov.; affine var. *albofusco* (*Koern.*) *Snowden*, a quo caryopsidibus flavido-brunneis vel brunneis vel rubido-brunneis regione nucellari fusco-colorata differt.

BELGIAN CONGO : Lomami, *Robyns* 2 (typus).

(7). Var. **sapidum** *Snowden*, var. nov.; affine var. *melanospermum* (*Hack.*) *Snowden*, sed spiculis sessilibus minoribus 3-3.5 mm. longis, caryopsidibus minoribus 3-3.5 mm. longis 2.5-3 mm. latis biconvexis flavidis vel brunneis vel rubidis differt.

SOUTH AFRICA : Zululand; *Pretoria Div. Bot.* 22 (typus).

(8). Var. **melanospermum** (*Hack.*) *Snowden*, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *melanospermum* *Hack.* in *DC. Monogr. Phan.* 6, 518 (1889).

SOUTH AFRICA : Cape of Good Hope, *Banks* (typus in *Herb. Vindob.*).

(9). Var. **breviaristatum** *Snowden*, var. nov.; affine var. *bicarinato* (*Hack.*) *Snowden*, a quo spiculis sessilibus brevioribus

3.5–4 mm. longis, lemmate superiore aristato vel raro mucronato differt.

NORTHERN RHODESIA : Mazabuka, *Moore* 26/1931 (typus).

(10). Var. **bicarinatum** (*Hack.*) *Snowden*, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *bicarinatus* *Hack.* in DC. Monogr. Phan. 6, 511 (1889).

HAITI ISLAND : Santo Domingo, *Ritter* (typus in Herb. Vindob.).

(11). Var. **ovoideum** *Snowden*, var. nov.; affine var. *albido* (*Koern.*) *Snowden*, a quo panícula ovoidea obtusa vel truncata densa et compacta 12–20 cm. longa 6–12 cm. lata, caryopsidibus albis flavis rubris vel brunneis differt.

SOUTH WEST AFRICA : Ovamboland ; comm. *District Commissioner* 4 (typus).

(12). Var. **Neesii** (*Koern.*) *Snowden*, comb. nov. *Andropogon Sorghum* var. *Neesii* *Koern.* Handb. Getreideb. 1, 315 (1885); *K. Schum.* in Engl. Pfl. Ost-Afr. B, 47 (1895).

(13). Var. **densissimum** (*Busse et Pilger*) *Snowden*, comb. nov. *Andropogon Sorghum* var. *densissimus* *Busse et Pilger* in Engl. Bot. Jahrb. 32, 188 (1902).

TANGANYIKA TERRITORY : Ugogo ; Ilindi, *Busse* 271 (typus in Herb. Berol).

25. **S. nigricans** (*Ruiz et Pavon*) *Snowden*, comb. nov. *Milium nigricans* *Ruiz et Pavon*, Fl. Peruv. 1, 47 (1798).

PERU : cultivated in Pillao, Cuchero and Pueblo Nuevo (typus in Herb. Hort. Bot. Matrit.).

(1). Var. **cerevisiae** (*Stapf*) *Snowden*, comb. nov. *Sorghum caudatum* var. *cerevisiae* *Stapf* in Prain Fl. Trop. Afr. 9, 132 (1917).

UGANDA : Toro ; 1500–1600 m., *Dawe* 527 (typus).

(2). Var. **nyanzae** *Snowden*, var. nov.; affine var. *Cerevisiae* (*Stapf*) *Snowden*, a quo spiculis sessilibus nonnihil majoribus 3–3.5 mm. longis, caryopsidibus majoribus 3.5–4 mm. latis, panícula robustiore, pedunculo valido usque ad 2 cm. diametro, ramis crassis prope basin usque ad 7 mm. latis differt.

TANGANYIKA TERRITORY : Ukerewe ; *Dept. Agric.* 129 (typus).

(3). Var. **peruvianum** (*Hack.*) *Snowden*, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *peruvianus* *Hack.* in DC. Monogr. Phan. 6, 512 (1889).

PERU : cultivated (1829), ex *Herb. Endl.* (typus in Herb. Vindob.).

(4). Var. **concolor** (*K. Schum.*) *Snowden*, comb. nov. *Andropogon Sorghum* var. *concolor* *K. Schum.* in Engl. Pfl. Ost-Afr. B. 42 (1895).

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TANGANYIKA TERRITORY : Ugogo ; Kisokwe, *Stuhlmann* 326 (typus in Herb. Berol.).

(5). Var. **lobatum** *Snowden*, var. nov.; affine var. *peruviano* (*Hack.*) *Snowden*, a quo panícula matura multilobata, ramulis fasciculatis differt.

BELGIAN CONGO : between Kibali and Ituri, Alur Territory, *Van Overstraeten* (typus).

(6). Var. **Stuhlmannii** (*Koern.*) *Snowden*, comb. nov. *Andropogon Sorghum* var. *Stuhlmannii* (*Koern.*) in Baumann, Massailand, 295 : 1894 (nomen), et ex *K. Schum.* in Engl. Pfl. Ost-Afr. B. 41 (1895).

TANGANYIKA TERRITORY : Unyamwesi ; Mkigua, *Stuhlmann* 476 (typus in Herb. Berol.). Mpwapwa, *Stuhlmann* 230 (in Herb. Berol.).

(7). Var. **ussienae** (*Koern.*) *Snowden*, comb. nov. *Andropogon Sorghum* var. *ussienae* *Koern.* in Baumann, Massailand, 295 (1894).

TANGANYIKA TERRITORY : West Ussui, *Baumann* 12 (typus in Herb. Berol.).

(8). Var. **angolense** (*Rendle*) *Snowden*, comb. nov. *Sorghum vulgare* var. *angolense* *Rendle* in Cat. Afr. Pl. Welw. 2, 151 (1899). *S. caudatum* var. *angolense* *Stapf* in Prain, Fl. Trop. Afr. 9, 132 (1917).

ANGOLA : Cazengo, on low hills by Liunha River, *Welwitsch* 7216 (typus in Herb. Mus. Brit.).

(9). Var. **calcareum** (*Busse et Pilger*) *Snowden*, comb. nov. *Andropogon Sorghum* var. *calcareum* *Busse et Pilger* in Engl. Bot. Jahrb. 32, 188 (1902).

TANGANYIKA TERRITORY : Ugogo ; Ilindi, *Busse* 276 (typus in Herb. Berol.).

(10). Var. **suffusum** *Snowden*, var. nov. *Panicula* contracta, densa vel laxiuscula, oblonga, lanceolato-oblonga vel elliptico-oblonga, 20–35 cm. longa, 5–12 cm. lata ; rami nisi prope basin graciles et flexuosi, inferiores 5–15 cm. longis. *Spiculae* sessiles late ellipticae vel late obovato-oblongae, 3–3.5 mm. longae, 2.5–3 mm. latae, fere glabrae vel sparse pilosae ; glumae coreaceae ; lemma superius mucronatum. *Caryopsides* maturae glumis longiores, 3.5–4 (raro 4.5) mm. longae, 3–3.5 mm. latae, valde obviae, dorso late ellipticae vel obovato-ellipticae vel obovato-rotundae, biconvexae, flavido-brunneae vel brunneae vel rubido-brunneae. *Spiculae pedicellatae* maturae plerumque deciduae, pedicellis 0.5–2 mm. longis.

BELGIAN CONGO : Ubangi ; Baugyville, *Robyns* 281 (typus).

26. **S. caudatum** *Stapf* in Prain, Fl. Trop. Afr. 9, 131–133 :

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1917 (pro parte; excl. vars. *angolense*, *Cerevisiae*, *umbonatum*, *rutilum*, and *atrolutescens*).

ANGLO-EGYPTIAN SUDAN: Jur, Ghatta's Seriba, *Schweinfurth* 180 (typus).

(1). Var. **gibbum** Stapf, l.c. p. 133.

ANGLO-EGYPTIAN SUDAN: Sennar, ex *Rubber Exhibition*, London, 1914 (typus).

(2). Var. **feterita** Stapf, l.c.

ANGLO-EGYPTIAN SUDAN: Geteina District, ex *Rubber Exhibition*, London, 1914 (typus).

(3). Var. **fragile** Stapf, l.c.

ANGLO-EGYPTIAN SUDAN: Sennar, ex *Rubber Exhibition*, London, 1914 (typus).

(4). Var. **talodianum** Snowden, var. nov., affine var. *gibbo* Stapf, a quo panicula et spiculis pilosissimis, spiculae sessilis glumis tenuiter coriaceis maturis lemmata dense ciliata exhibentibus, caryopsidibus dorso late ellipticis vel oblatiis albidis flavidis vel rubidis differt.

ANGLO-EGYPTIAN SUDAN: Talodi, ex *Khartoum Plant Breeding Section* 55.M.C.5 (typus).

(5). Var. **caudatum** (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *caudatus* Hack. in DC. Monogr. Phan. 6, 517 (1889). *Sorghum caudatum* var. *Schweinfurthii* Stapf in Prain, Fl. Trop. Afr. 9, 133: 1917 (pro parte).

ANGLO-EGYPTIAN SUDAN: Jur, Ghatta's Seriba, *Schweinfurth* 180 (typus).

(6). Var. **Lens** Stapf, l.c.

UGANDA: Toro; 1200–1800 m., Dawe 528 (typus).

(7). Var. **natae** (Koern.) Snowden, comb. nov. *Andropogon Sorghum* var. *natae* Koern. in Baumann, Massailand, 296 (1894).

TANGANYIKA TERRITORY: Nata, Baumann 26 (typus in Herb. Berol.).

(8). Var. **bantuorum** Snowden, var. nov.; a var. *caudato* (Hack.) Snowden caryopsidibus late obovato-ellipticis vel obovato-rotundis brunneis vel rubidis apice plerumque lato et crasso differt.

BELGIAN CONGO: between Kibali and Ituri; Walendu Territory, *Schoolmeesters* (typus).

(9). Var. **scoparium** Snowden, var. nov.; affine var. *bantuorum* Snowden, a quo panicula laxiore oblanceolata umbellata vel corymbiformi, rhachi valde abbreviata, caryopsidibus albidis cinerascensibus rubidis vel brunneis differt.

BELGIAN CONGO: between Kibali and Ituri, Alur Territory, Chief Dema (typus).

(10). Var. **durum** Snowden, var. nov.; affine var. *caudato* (Hack.) Snowden, sed caryopsidibus brevioribus 3.5–4 mm. longis plus minusve biconvexis dorso saepe orbicularibus vel oblatiis endospermo plerumque duro et corneo vel siliceo regione nucellari haud fusco-colorata differt.

ANGLO-EGYPTIAN SUDAN: without precise locality, ex *Rubber Exhibition*, London, 1914 (typus).

Vern. name: *Zerzereih*.

(11). Var. **Kerstingianum** (Busse et Pilger) Snowden, comb. nov. *Andropogon Sorghum* var. *Kerstingianus* Busse et Pilger in Engl. Bot. Jahrb. 32, 187 (1902).

DAHOMY: Sokode, *Kersting* 18 (typus in Herb. Berol.).

(12). Var. **procerum** Snowden, var. nov.; affine var. *Kerstingiano* (Busse et Pilger) Snowden, a quo panicula graciliore laxiuscula, rhachi plus minusve exposita sparse hirsuta, caryopsidibus raro cereo-flavidis differt.

ANGLO-EGYPTIAN SUDAN: Bahr El Ghazal, *Punter* 35 (typus).

(13). Var. **sudanicum** Snowden, var. nov.; affine var. *procero* Snowden, a quo caryopsidibus multo compressis et applanatis calcareis vel cinereis regione nucellari majore fusco-colorata differt.

ANGLO-EGYPTIAN SUDAN: Bahr El Ghazal, *Punter* 34 (typus).

(14). Var. **colorans** (Pilger) Snowden, comb. nov. *Andropogon Sorghum* var. *colorans* Pilger in Notizbl. Bot. Gart. Berl. 4, 146 (1904).

DAHOMY: (Togoland), *Kersting* (typus in Herb. Berol.).

(15). Var. **Hackelii** (Chiov.) Snowden, comb. nov. *Sorghum eplicatum* var. *Hackelii* Chiov. in Monogr. Rapp. Colon. Rome, No. 19, Oct. 1912, p. 30.

ERITREA: Cheren, ex *International Exhibition*, Turin, 1911, 125 bis (typus in Herb. Florent.).

27. **S. dulcicaule** Snowden, sp. nov.; affine *S. caudato* Stapf et *S. caffrorum* Beauv., ab illo spiculis sessilibus maturis hiantibus, glumis caryopsidi maturae aequilongis, spiculis pedicellatis persistentibus, panicula laxiore, culmis dulcibus et succidis, ab hoc spiculis sessilibus obovato-ellipticis vel obovato-oblongis differt.

Culmi validi, usque ad 2.5 m. alti, dulces et succidi. Folia 8–12 vel ultra; laminae usque ad 60 cm. (vel ultra) longae et 6 cm. latae, Panicula laxa, elliptica vel elliptico-oblonga, 20–35 cm. longa, 5–12 cm. lata; rhachis multo exposita, nodis plus minusve villosa; rami prope basin suberecti et validiusculi, ceterum graciliores, flexuosi et patentes, prope basin et axillis ramulorum villosi, inferi-

ores 10–15 cm. longi. *Spiculae sessiles* obovato-ellipticae vel obovato-oblongae, obtusae vel breviter acutae, 4–5 mm. longae, 2.5–3.5 mm. latae, praecipue prope margines et apicem versus perpetuo strigoso-pilosae. *Glumae* aequales, coriaceae; inferior prope apicem tenuiter et obscure bicarinata. *Lemmata* hyalina, tenuiter ciliata; superius mucronatum. *Caryopsides* maturae glumis plus minusve aequilongae, ab utraque fere liberae vel ab altera comprehensae facile caducae, 4–4.5 mm. longae, 3–3.75 mm. latae, dorso late ellipticae vel rotundatae, plano-convexae, flavidae vel rubido-brunneae vel atro-brunneae; endospermum farinaceum, regione nucellari fusco-colorata. *Spiculae pedicellatae* elliptico-lanceolatae vel anguste lanceolatae, 3–4.5 mm. longae, steriles, persistentes, pedicellis ciliatis 0.5–1.5 (raro 2) mm. longis.

BELGIAN CONGO: Katanga District; between Luapula and Kilwa, *Marchal* 3 (typus).

SUB-SERIES VI. DURRA.

Spiculae sessiles aut transverse rugosae et circa medium depressae (et tunc *glumae* saepe tenuiter chartaceae) aut sub anthesi gluma inferiore cum apice herbaceo valde striatinervi, late ovatae, obovatae, obovato-ellipticae, obovato-oblongae, rhomboideae vel subhexagonae *caryopsides* maturae glumis aequilongae vel plerumque multo longiores et facile caducae (excl. *S. rigido* Snowden); *spiculae pedicellatae* pedicellis brevibus 0.5–2 mm. longis persistentibus (excl. *S. rigido* Snowden) praeditae; panicula plerumque densa et compacta vel interdum laxa, rhacheos rami et ramuli tomentosi vel villosi (excl. *S. rigido* Snowden).

28. *S. rigidum* Snowden sp. nov.; affine *S. Durra* Stapf et *S. Ankolib* Stapf, ab illo *caryopsidibus* maturis glumis brevioribus, *spiculis pedicellatis* maturis deciduis, pedicellis 3–5 mm. longis, panicula fere glabra, ab hoc *spiculis sessilibus* magis obovato-ellipticis, *lemmate superiore longiaristato*, *caryopsidibus* maturis inter *glumes* magis obviis, pedicellis longioribus, *spiculis pedicellatis* deciduis differt.

Culmi validi, usque ad 3 m. alti vel ultra, prope basin 2 cm. lati. *Folia* usque 20 vel plura; *laminae summae* usque ad 40 cm. longae, 6 cm. latae. *Panicula* nonnihil contracta, lanceolata vel oblonga, 20–35 cm. longa, 7–10 cm. lata; *rhachis superne* scabrida, ceterum glabrescens; *rami suberecti*, prope basin validi, ceterum graciliores, firmi necnon tandem rigidi, superne scabridi, ceterum pilis paucis albis crassiusculis prope basin et in axillis ramulorum exceptis glabri. *Spiculae sessiles* late ellipticae vel obovato-ellipticae, acutae, sub anthesi 6–8 mm. longae, 3.5–4 mm. latae, maturae latius obovato-ellipticae et usque ad 5.5 mm. latae, glabrae, opacae vel nonnihil nitentes. *Glumae* aequales, triente superiore tenuiter herbaceae, ceterum coriaceae, apicibus maturis satis fragilibus; gluma inferior tenuiter bicarinata, carinis scabrida. *Lemmata*

hyalina, sparse vel modice ciliata; superius arista usque ad 14 mm. longa praeditum. *Caryopsides* maturae inter *glumas* partim inclusae vel leviter obviae, glumis breviores, dorso subrotundae vel orbiculares, 5–5.5 mm. longae, 4.75–5 mm. latae, 3 mm. crassae, fulvo-rubrae vel rubidae. *Spiculae pedicellatae* lineari-lanceolatae vel cultratae, 8–11 mm. longae, ♂ vel nonnunquam hermaphroditae, maturae deciduae.

ANGLO-EGYPTIAN SUDAN: Blue Nile District, Kamlin, *Punter* 85 (typus).

29. *S. Durra* (Forsk.) Battand. et Trab. Fl. Algér, Monocot 128: 1895 (pro prole); Stapf in Prain Fl. Trop. Afr. 9, 129: 1917 (pro species).

(1). Var. **aegyptiacum** (Koern.) Snowden, comb. nov. *Andropogon Sorghum* var. *aegyptiacus* Koern. apud Aschers. et Schweinf. in Mém. Inst. Egypt, 2 (Illustr. Fl. d’Egypt, 164: 1887). EGYPT: Assouan; Ehrenberg (typus in Herb. Berol.).

(2). Var. **Fiorii** (Chiov.) Snowden, comb. nov. *Sorghum eplicatum* var. *Fiorii* Chiov. in Monogr. Rapp. Colon. Rome, No. 19. Oct. 1912, p. 31.

ERITREA: without precise locality, ex *International Exhibition, Turin, 1911*, 90 (typus in Herb. Florent.).

(3). Var. **rutilum** (Stapf) Snowden, comb. nov. *Sorghum caudatum* var. *rutilum* Stapf in Prain, Fl. Trop. Afr. 9, 133 (1917).

ANGLO-EGYPTIAN SUDAN: without precise locality, ex *Rubber Exhibition, London, 1914* (typus).

(4). Var. **niloticum** (Koern.) Snowden, comb. nov. *Andropogon Sorghum* var. *niloticus* Koern. apud Aschers. et Schweinf. in Mém. Inst. Egypt, 2, (Illustr. Fl. d’Egypt, 778: 1889).

EGYPT: Massarah above Cairo, Schweinfurth (mature panicle; typus in Herb. Berol.).

(5). Var. **melanoleucum** (Chiov.) Snowden, comb. nov. *Sorghum eplicatum* var. *melanoleucum* Chiov. in Monogr. Rapp. Colon. Rome, No. 19, Oct. 1912, p. 30. *S. caudatum* var. *atrolutescens* Stapf in Prain, Fl. Trop. Afr. 9, 133 (1917).

ERITREA: Barentu, ex *International Exhibition, Turin, 1911*, 22 (typus in Herb. Florent.).

(6). Var. **mediocre** (Burkill) Snowden, comb. nov. *Andropogon Sorghum* var. *mediocris* Burkill ex Benson et Subba Rao, Madras Dept. Agric. Bull. No. 55, 68: 1906 (pro parte; excl. subv. *fuscescens* et subv. *ruber*).

INDIA: Madras; Kristna, ex *Herb. Rep. Econ. Prod. India* 15560 (typus).

(7). Var. **coimbatoricum** (Burkill) Snowden, comb. nov. *Andropogon Sorghum* var. *coimbatoricus* Burkill ex Benson et Subba Rao, l.c.

INDIA : Madras ; Coimbatore District, ex *Herb. Rep. Econ. Prod. India* 15593 (typus).

(8). Var. **javanicum** (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *javanicus* Hack. in DC. Monogr. Phan. 6, 517 (1889).

AUSTRIA : Vienna, cultivated in the Botanical Gardens, seed from Java (typus in Herb. Vindob.).

(9). Var. **fecundum** Snowden, var. nov. *Panicula* compacta vel raro nonnihil laxa, ovata, elliptico-oblonga vel elliptica, 7-15 (raro 20) cm. longa, 5-10 cm. lata ; rami breves et rigidi vel raro longiores et nonnihil flexuosi. *Spiculae* sessiles obovato-ellipticae, 4.5-5.5 mm. longae, 3-3.5 mm. latae, prope margines et apicem versus pilosae ; glumae ad medium tenuiter coriaceae, ceterum herbaceae vel subpapyraceae, apicibus maturis fragilibus ; lemma superius arista 8-12 mm. longa praeditum (raro mucronatum). *Caryopsides* maturae inter glumas apice magis obviae, 4-5.5 mm. longae, 3-5-4.5 mm. latae, dorso ellipticae vel obovato-ellipticae, albidae, flavidae vel ochraceae. *Spiculae pedicellatae* 4-6 mm. longae.

INDIA : Bombay ; Sind, ex *Herb. Econ. Bot. Poona Agric. Coll.* 40 (typus).

(10). Var. **eois** (Burkill) Snowden, comb. nov. *Andropogon Sorghum* var. *eois* Burkill ex Benson et Subba Rao in Madras Agric. Bull. No. 55, 67 (1906).

INDIA : Punjab ; Dera Ismail Khan, ex *Herb. Rep. Econ. Prod. India* 15924 (typus).

(11). Var. **elongatum** Snowden, var. nov. ; a var. *fecundo* Snowden differt panicula laxiore et longiore oblonga vel lanceolato-oblonga 15-30 cm. longa, ramis longioribus basi exepa flexibilibus, spiculis sessilibus usque ad 6 mm. longis et 4 mm. latis, spiculis pedicellatis 6-9 mm. longis.

INDIA : Bombay ; Sind, ex *Herb. Econ. Bot. Poona Agric. Coll.* 26 (typus).

(12). Var. **erythrocarpum** (Chiov.) Snowden, comb. nov. *Sorghum eplicatum* var. *erythrocarpum* Chiov. in Monogr. Rapp. Colon. Rome, No. 19, Oct. 1912, p. 29.

ERITREA : Barentu, ex *International Exhibition, Turin, 1911*, 23 (typus in Herb. Florent.).

(13). Var. **fuscum** Snowden, var. nov. ; affine var. *fecundo* Snowden, sed glumae apicibus maturis haud fragilibus, caryopsidibus

minoribus maturis inter glumas nonnunquam fere inclusis 3-4 mm. longis 2.5-3 mm. latis fulvo-rubris vel rubris vel brunneis differt.

INDIA : Bombay ; Sind, Hyderabad, *Navani* 2 (typus).

(14). Var. **rivulare** Snowden, var. nov. ; a var. *nilotico* (Koern.) Snowden differt spiculis sessilibus majoribus latius obovatis glabrescentibus 5-6 mm. longis maturis usque ad 5 mm. latis apice primo haud luteo-tinctis, caryopsidibus dorso orbicularibus vel oblatis 4.5-5 mm. latis albidis vel fulvis vel rubidis.

ANGLO-EGYPTIAN SUDAN : White Nile, *Punter* 56 (typus).

(15). Var. **luteolum** Snowden, var. nov. ; affine var. *rivulari* Snowden, sed panicula saepe cylindrica truncata, spiculis sessilibus apice primo luteo-tinctis, lemmate superiore longiaristato, caryopsidibus eburneo-flavis vel flavis, spiculis pedicellatis primo luteo-tinctis differt.

EGYPT : Fashn, *Didgeon* B (typus).

(16). Var. **maximum** Snowden, var. nov. ; a var. *rivulari* differt spiculis sessilibus latioribus maturis usque ad 6 mm. latis sub anthesi apicibus valde depressis, lemmate superiore saepe aristato, caryopsidibus usque ad 6 mm. longis et latis.

ANGLO-EGYPTIAN SUDAN : Gedarif, *Punter* 5 (typus).

30. *S. cernuum* Host, Gram. 4, 2, Tab. 3 (1809).

(1). Var. **Truchmenorum** (Koern.) Snowden, comb. nov. *Andropogon Sorghum* var. *Truchmenorum* Koern. in Handb. Getreideb. 1, 315 (1885) ; *Sorghum Truchmenorum* C. Koch in Linnaea 21, 442 (1848).

RUSSIA : Transcaspiian Province, *Koch* (typus).

(2). Var. **yemense** (Koern.) Snowden, comb. nov. *Andropogon Sorghum* var. *yemensis* Koern. in Bull. Herb. Bois. 2, App. 2, 11 : 1894 (non Koern. in Baumann, Massailand 295 : (1894).

ARABIA : Yemen. east of Marraua, *Schweinfurth* 162 (typus in Herb. Berol.)

(3). Var. **agricolarum** (Burkill) Snowden, comb. nov. *Andropogon Sorghum* var. *agricolarum* Burkill ex Benson et Subba Rao in Madras Dept. Agric. Bull. No. 55, 67 : 1906 (pro parte ; subv. *rubescens*).

INDIA : Central Provinces ; Ellichpur District, ex *Herb. Rep. Econ. Prod. India* 22941 (typus).

(4). Var. **globosum** (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *globosus* Hack. in DC. Monogr. Phan. 6, 517 (1889).

INDIA : Bihar & Orissa ; Serampur, Voigt (typus in Mus. Bot. Haun.).

(5). Var. **orbiculatum** Snowden, var. nov. *Panicula* oblonga vel ovato-oblonga, densa et compacta vel nonnunquam laxiuscula, 8–20 cm. longa, 4–12 cm. lata, rami prope basin validiusculi et nonnihil rigidi, ceterum magis graciles, inferiores usque ad tertiam partem paniculae longi. *Spiculae* sessiles ovatae vel nonnihil obovato-oblongae, 4–5.5 mm. longae, 3–4 mm. latae ; glumae tenues et papyraceae vel crassiusculae et spongiosae ; inferior saepe transverse rugosa et circa medium depressa ; lemma superius aristatum. *Caryopsides* maturae valde obviae, glumis longiores, 4–5 mm. longae et latae, dorso rotundatae vel orbiculares, valde compressae et applanatae, albidae, flavidae vel rubidae. *Spiculae pedicellatae* 4–5 mm. longae, persistentes, pedicellis 0.5–1.5 mm. longis.

INDIA : Central Provinces ; Yeotmal, Youngman 56 (typus).

(6). Var. **subcylindricum** Snowden, var. nov. ; affine var. *orbiculato* Snowden, sed panicula densa et compacta subcylindrica sursum nonnihil conica 5–15 cm. longa et 4–8 cm. lata, caryopsidibus minus compressis 3.5–4 mm. longis et 3–3.5 mm. latis eburneo-flavis vel flavis differt.

INDIA : Bombay ; Poona, ex Herb. Econ. Bot. Poona Agric. Coll. 65 (typus).

(7). Var. **cernuum** (Koern.) Snowden, comb. nov. *Andropogon Sorghum* var. *cernuus* Koern. in Handb. Getreideb. 1, 314 : 1885 (pro parte) ; *Holcus cernuus* Ard. in Saggi Sc. Lettr. Accad. Padova, 1, 128. t. 3, figs. 1, 2 (1786).

31. **S. subglabrescens** (Steud.) Schweinf. et Aschers. in Schweinf. Beitr. Fl. Aethiop. 302, 306 (1867). *Andropogon subglabrescens* Steud. Syn. Pl. Glum. 1, 393 (1854).

(1). Var. **pabulare** Snowden, var. nov. *Culmi* comparatavi graciles, usque ad 1.5 m. alti. *Folia* numerosa, usque ad 50 cm. longa et 4 cm. lata. *Panicula* laxa vel nonnihil contracta, oblonga vel elliptico-oblonga, 10–20 cm. longa, 2–6 cm. lata ; rami nisi prope basin graciles, inferiores 2.5 cm. longi. *Spiculae* sessiles 4–5 mm. longae, primo pilosae, maturae glabrescentes ; glumae nisi prope basin tenuiter papyraceae ; lemma superius aristatum ; caryopsides maturae glumis aequilongae vel raro longiores, usque ad 4 mm. longae et 3 mm. latae, dorso ellipticae vel obovatae, biconvexae, apice late rotundatae, albidae, eburneo-flavae vel fulvae.

INDIA : Bombay ; Baroda, Ryan (typus).

(2). Var. **rugulosum** (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *rugulosus* Hack. in DC. Monogr. Phan. 6, 508 (1889).

ABYSSINIA : Cultivated, ex Herb. Braun (typus in Herb. Berol.).

(3). Var. **paniculatella** (Chiov.) Snowden, comb. nov. *Sorghum basiplicatum* var. *paniculatella* Chiov. in Monogr. Rapp. Colon. Rome, No. 19, Oct. 1912, p. 38.

ERITREA : without precise locality, ex *International Exhibition, Turin, 1911*, 9 (typus in Herb. Florent.).

(4). Var. **microcarpum** (Chiov.) Snowden, comb. nov. *Sorghum basiplicatum* var. *microcarpum* Chiov. in Monogr. Rapp. Colon. Rome, No. 19, Oct. 1912, pl. 46.

ERITREA : without precise locality, ex *International Exhibition, Turin, 1911*, 93 (typus in Herb. Florent.).

(5). Var. **leiocladum** Snowden, var. nov. *Panicula* laxa, oblanceolata, circa 25 cm. longa et 10 cm. lata ; rami suberecti, nisi prope basin graciles, laeves et pilis paucis prope basin exceptis fere glabri, inferiores usque ad 12 cm. longi. *Spiculae* sessiles 4–5 mm. longae, maturae glabrae vel fere glabrae ; glumae nisi prope basin et infra apicem tenuiter papyraceae ; lemma superius aristatum ; caryopsides maturae glumis fere aequilongae, 4–4.5 mm. longae, 2.75–3 mm. latae, dorso obovatae vel subrotundae, apices rotundatae et plus minusve obviae, ferrugineae vel rubido-brunneae.

ABYSSINIA : Schoa, 2300 m., Ellenbeck 1637 (typus in Herb. Berol.).

(6). Var. **rubidum** (Burkill) Snowden, var. nov. *Andropogon Sorghum* var. *irungiformis* subv. *rubidus* Burkill ex Benson et Subba Rao in Madras Agric. Bull. No. 55, 68 (1906). Affine var. *leioclado* Snowden, sed panicula contracta et densa vel raro laxiuscula oblonga vel elliptico-oblonga, 10–25 cm. longa, ramis plus minusve scabridis inferioribus usque ad tertiam partem paniculae longis, caryopsidibus maturis 3–4 mm. latis differt.

INDIA : Madras ; Coimbatore ex Herb. Rep. Econ. Prod. India, Barber 961 (typus).

(7). Var. **compactum** (Burkill) Snowden, comb. nov. *Andropogon Sorghum* var. *compactus* Burkill ex Benson et Subba Rao, l.c. pp. 67, 69 (pro parte ; excl. subv. *roseus*).

INDIA : Madras ; Bellary, ex Herb. Rep. Econ. Prod. India 17840 (typus).

(8). Var. **irungiforme** (Burkill) Snowden, comb. nov. *Andropogon Sorghum* var. *irungiformis* Burkill ex Benson et Subba Rao, l.c. p. 68 (pro parte ; excl. subv. *sulphureus* et subv. *rubidus*).

INDIA : Madras ; Trichinopoly, ex Herb. Rep. Econ. Prod. India 15610 (typus).

(9). Var. **oviforme** Snowden, var. nov. *Culmi* saepe dulces, 1-2.5 m. alti. *Panicula* matura densa et compacta, saepe cernua, ovata vel subovata, 10-15 cm. longa, 6-10 cm. lata; rami plus minusve rigidi, inferiores usque ad 6 cm. longi. *Spiculae* sessiles 4-5 mm. longae, 2.5-4 mm. latae, maturae glabrae vel fere glabrae; lemma superius aristatum; caryopsides maturae valde obviae, 3.75-5 mm. longae, 2.25-4 mm. latae, dorso obovatae, eburneo-flavae, fulvae, vel rubidae.

INDIA: Bombay; Poona, ex *Herb. Econ. Bot. Poona Agric. Coll.* 72 (typus).

(10). Var. **abyssinicum** (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *abyssinicus* Hack. in DC. Monogr. Phan. 6, 518 (1889).

ABYSSINIA: without precise locality, *Dillon & Petit* (typus in *Herb. Vindob.*).

(11). Var. **subglabrescens** (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *subglabrescens* Hack. in DC. Monogr. Phan. 6, 519 (1889).

ABYSSINIA: hillsides above Jela Jeranne, *Schimper* 623 (typus).

(12). Var. **Schimperi** (Hack.) Snowden, comb. nov. *Andropogon Sorghum* subsp. *sativus* var. *Schimperi* Hack. in DC. Monogr. Phan. 6, 518 (1889).

ABYSSINIA: without precise locality, *Schimper* 968 (typus).

(13). Var. **leucocarpum** (Chiov.) Snowden, comb. nov. *Sorghum basiplicatum* var. *leucocarpum* Chiov. in Monogr. Rapp. Colon. Rome, No. 19, Oct. 1912, p. 42.

ERITREA: without precise locality, ex *International Exhibition, Turin, 1911*, 131 (typus in *Herb. Florent.*).

(14). Var. **umbonatum** (Stapf) Snowden, comb. nov. *Sorghum caudatum* var. *umbonatum* Stapf in Prain, Fl. Trop. Afr. 9, 133 (1917).

ANGLO-EGYPTIAN SUDAN: without precise locality, ex *Rubber Exhibition, London, 1914* (typus).

(15). Var. **rubrocernuum** (Koern.) Snowden, comb. nov. *Andropogon Sorghum* var. *rubrocernuum* Koern. in Bull. Herb. Boiss. 2, App. 2, 12 (1894).

ARABIA: Yemen: Hodjela and Menacha, *Schweinfurth* (typus).

(16). Var. **arabicum** (Koern.) Snowden, comb. nov. *Andropogon Sorghum* var. *arabicum* Koern. in Bull. Herb. Boiss. 2, App. 2, 12 (1894).

ARABIA: Yemen; above Menacha, near El Ejan, 2600 m. *Schweinfurth* (typus).

(17). Var. **latum** Snowden, var. nov. *Panicula* contracta et densa vel laxiuscula, robustae, ovata, elliptica, vel oblonga, 15-25 cm. longa, 7-12 cm. lata; pedunculus validus, 1-2.5 cm. latus, saepe recurvus; rami prope basin validi vel validissimi, ceterum graciles sed rigidi, inferiores 5-10 cm. longi. *Spiculae* sessiles 4-5.5 mm. longae, 3-5 mm. latae, maturae glabrae vel prope apicem et margines, parce pilosae; glumae prope basin et infra apicem crassiusculae spongiosae vel subcoriaceae, ceterum subpapyraceae; lemma superius aristatum vel mucronatum; caryopsides maturae glumis nonnihil longiores valde obviae, 4-5 mm. longae, 3.5-5 mm. latae, dorso rotundatae, orbiculatae, oblatae vel obovatae, albidae, flavae, vel rubidae.

BRITISH SOMALILAND: without precise locality, *Farquharson* 1 (typus).

XXII—NEW TREES AND SHRUBS FROM TROPICAL AFRICA: IV*. A. C. HOYLE AND H. DUNKLEY.

Dasylepis Burt-Davyi Edlin, sp. nov. [Flacourtiaceae]; affinis *D. integrae* Warb., sed foliis basi cuneatis, racemis pedicellisque brevioribus differt.

Arbor glabra; ramuli tenues, cinereo-brunnei; stipulae caducae; petioli 5 mm. longi, canaliculati. *Folia* coriacea, 10-15 cm. longa, 3-5 cm. lata, venis elevatis reticulata, elliptico-vel oblongo-lanceolata, plus minusve falcata, apice acuta, basi late cuneata, margine integro; nervi laterales utrinque 6-9, arcuatim ascendentes, crebre conjuncti. *Racemi* pauciflori, axillares, 3-4 cm. longi; pedicelli brevissimi, dense bracteati, ad 2 mm. longi; bractae orbiculatae, cupulares, ad 1 mm. diametro, ciliatae. *Flores* (alabastra tantum visa) 5 mm. diametro. *Perianthii* segmenta circiter 10, valde inaequalia, ciliata; 3 externa bracteis similia, coriacea, orbiculata, 2-3.5 mm. diametro; 2 intermedia chartacea, petaloidea nec tamen squamata, late elliptica, 4 mm. longa, 3 mm. lata; 5 interna chartacea, petaloidea, latissime elliptica vel obovata, 4-5 mm. longa, 3-4 mm. lata, unumquodque squama basali tomentosa adnata 1.5 mm. longa munitum. *Stamina* circiter 20; filamenta complanata, 2 mm. longa; antherae 3 mm. longae, lineari-lanceolatae. *Ovarium* sulcatum, glabrum, 2-3 mm. longum; styli 3, praeter medium connati, apice divaricati; placentae parietales ovulis numerosis.

SOUTH TROPICAL AFRICA. Nyasaland: Mlanje Mountain, Lichenya Plateau, about 6,500 ft. altitude, September, 1929, *Burt Davy* 22043, type, in Kew herb., and Imperial Forestry Institute herb., Oxford.

* Continued from K.B. 1934, 190.

A tree of the montane evergreen rain forest, associated with *Aphloia myrtiflora* Galp., *Royena lucida* L., *Canthium Gueinzii* Sond., *Lasianthus kilimandscharicus* K. Sch., and species of *Garcinia*.

The above description and part of the type specimen have been submitted to Dr. H. Sleumer of Dahlem, Berlin, who agrees that the species is distinct, and has recommended its publication.

Grewia velutinissima Dunkley, sp. nov. [Tiliaceae]; affinis *G. cordatae* N.E. Br., a qua sepalis longioribus, stylo brevioribus staminibus haud superante, foliis basi oblique rotundatis nec cordatis recedit.

Arbor parva, trunco circiter 12 cm. diametro, juvenilibus omnino dense fulvo-stellato-tomentosis. *Stipulae* 6 mm. longae, oblique lanceolato-subulatae, latere superiore plus minusve lobatae. *Folia* 5-7.5 cm. longa, 3-4.5 cm. lata, oblique oblata vel obovato-oblonga, apice irregulariter rotundata vel obtusa, basi oblique rotundata vel subtruncata, 3-5-nervia, supra viridia et breviter stellato-tomentosa, infra manifeste pallidiora pilis stellatis griseo-fulvis tomentosa, margine irregulariter crenulato-serrulata; nervi laterales supra utrinque 4, subtus prominentes, venis parallelis; petiolus 5 mm. longus. *Cymae* axillares, umbelliformes, pauciflorae, plerumque fasciculatae; pedunculi 1-1.5 cm. longi; pedicelli 3-5 mm. longi; bracteae basales minutae, caducae; bracteolae 5 mm. longae, lanceolatae, extra fulvo-tomentosae, intus parce glanduloso-pubescentes. *Alabastra* 8-10 mm. longa, 4 mm. lata, oblongo-ovoidea. *Sepala* 1-1.3 cm. longa, 3 mm. lata, linearilanceolata, unicostata, stellato-pustulata. *Petala* 6 mm. longa, 3 mm. lata, obovata, limbo membranaceo, glandula orbiculata, margine fimbriato atque tomentoso-ciliato. *Stamina* glabra, 7-9 mm. longa. *Ovarium* sessile, dense pilosum, stylo crasso sulcato, stigmate 4-lobato. *Fructus* 1-2-pyrenus, olivaceus, pilis longis stellatis sparse munitus; pyrenae sphaericae, 7-10 mm. diametro, 3-6-loculares, 1-2-spermae (2-4 loculis abortivis), pericarpio carnosulo, mesocarpio fibrato, endocarpio crasso corneo stramineo. *Semina* ellipsoidea, lateraliter compressa, circiter 4.5 mm. longa, pallide griseo-brunnea.

SOUTH TROPICAL AFRICA. Northern Rhodesia: Bombwe, J. D. Martin 350 (flowers), 642 (fruits from same tree), type, in Kew herb. and Imperial Forestry Institute herb., Oxford; "small tree, 5" diameter at breast height"; flowers in Nov., 1932, fruits in April, 1933.

Vernacular names: "muNzo" (Chitoka); "muUndu" (Chikaondi).

Hibiscus Burt-Davyi Dunkley, sp. nov. [Malvaceae]; affinis *H. gossypino* Thunb., sed omnibus membris multo majoribus, seminibus glabris (haud gossypinis), epicalycis segmentis pluribus longioribus, quam calycis lobis facile distinguitur.

Frutex erectus, circiter 2 m. altus, omnino stellato-tomentosus. *Folia* ovato-lanceolata, vel irregulariter trilobata, 6-12 cm. longa, 3-6 cm. lata, basi rotundata, quinquenervia, apice acuta, supra pilis stellatis adpressis scabrida, in sicco brunneo-viridia, subtus pallida, densius stellato-ferrugineo-tomentosa, nervis venisque utrinque elevatis, margine irregulariter crenato, petiolo crasso 2-3 cm. longo. *Stipulae* filiformes, 5 mm. longae. *Flores* terminales, breviter pedunculati. *Epicalycis* lobi 17, filiformes, 2 cm. longi. *Calyx* campanulatus, intus pilis simplicibus brevibus aureis, extra pilis longioribus furcatis fuscis dense vestitus; lobi lanceolato-ovati, tricostati, 1.5 cm. longi, 0.8 cm. lati. *Corolla* 4.5 cm. longa, purpurea. *Columna staminea* integra, 1.5 cm. longa. *Ovarium* 5-loculare, longe pilosum; ovula in loculis 3. *Stylus* basi simplex, superne 5-furcatus; rami minute pubescentes, apice capitato-stigmatosi. *Fructus* vix 1 cm. longus, longe pilosus, epicalycis bracteis et calyce persistentibus cinctus. *Semina* plerumque 2 pro loculo, reniformia, glabra, 3 mm. longa, 2 mm. lata, 1.5 mm. diametro.

SOUTH TROPICAL AFRICA. Nyasaland: Mt. Mlanje, J. Burt Davy 22097, type, in Kew herb. and Imperial Forestry Institute herb., Oxford, "shrub 4-6 ft. fringing the forest at about 7,000 ft. on the slopes of the plateau basin, Lichenya Plateau, Mt. Mlanje," Sept. 24th, 1929; Tuchila Plateau, 6,000 ft. alt., J. M. Purves 84, "a shrub 4-6 ft.," August, 1901.

This handsome species occurs on the outer margin of the mixed evergreen montane rain-forest (*Rapanea-Aphloia* - *Lachnophyllis-Olinia-Olea* association) associated with *Vaccinium africanum* Britt., *Helichrysum Hochstetteri* Hook. f., *Phyllanthus guineensis* Pax, *Angraecum verrucosum* Rendle, and a species of *Elaeodendron* (22102). The Hibiscus is worthy of cultivation as an ornamental shrub; coming from a comparatively high altitude (7,000 ft.) with cold winter nights and a good average rainfall, it is not unlikely that the species would prove hardy in the open in the warmer and moister parts of Western England, Scotland and Ireland.

J. B. D.

Drypetes Vignei Hoyle, sp. nov. [Euphorbiaceae - Phyllanthae]; affinis *D. Dinklagei* (Pax) Hutch., a qua pedicellis ♂ longioribus, fructu minore haud longe setoso, foliis regulariter et plerumque acute crenato-serratis, recedit.

Arbor ramosa, 8-13 m. alta, ramulis novellis tenuibus sulcatis ferrugineo-pubescentibus mox glabris. *Folia* saepe subdisticha, tenuiter coriacea, utrinque reticulata, glabra, 10-25 cm. longa, 5-10 cm. lata, elliptica vel ovato-elliptica vel oblongo-elliptica vel lanceolata, apice plerumque longiuscule et obtuse acuminata, basi sensim vel breviter cuneata, margine distanter crenato-serrata rarissime subintegra; nervi laterales praecipui utrinque 5-7, arcuatim adscendentes, crebre conjuncti; petiolus 5-10 mm. longus, ferrugineo-pubescent. *Flores* ♂ axillares, fasciculati, pro axilla

10-15; bracteae ovato-rotundatae, 1.5 mm. longae, ferrugineo-tomentellae, caducae; pedicelli 3-5 mm. longi, tomentelli. *Sepala* 5, inaequalia, ovata vel rotundata, obtusa, 2.5-3 mm. longa, extra tomentella, intus marginem versus tomentella, aliter glabra. *Stamina* 4-6, filamentis circiter 1 mm. longis. *Discus* cupularis, coriaceus, ater, valde plicatus et crenulato-crispatus, glaber. *Flores* ♀ haud visi. *Fructus juvenilis* in axillis solitarius, pedicello 6-7 mm. longo tomentello, sepalis deciduis, disco tenue persistente breviter cupulari, stylis patentibus breviter linearibus, stigmatibus transverse elongato canaliculato. *Fructus maturus* bilocularis, carnosulus, ovoideo-globosus, circiter 1.8 cm. diametro, ferrugineo-tomentellus, pedicello circiter 1 cm. longo tomentello. *Semina* pro loculo 1, oblongo-ellipsoidea, rubro-brunnea, rugulosa, 13 mm. longa, 5-6 mm. crassa, albumine amplo incano duriusculo.

WEST TROPICAL AFRICA. Gold Coast: Mampong Scarp at 1,500 ft. altitude, C. Vigne 1062, type, in Kew herb. and Imperial Forestry Institute herb., Oxford, with male flowers, March, 1928; Southern Scarp Reserve, H. W. Moor 2344, with mature fruits, May, 1931; E. Akim, Konkong, W. H. Johnson 595, with very young fruits, 9th March, 1900; Bonsu, Mrs. R. Burnett 72, with young fruits, March 1926; Southern Scarp Reserve, H. W. Moor 2105, leaves only, Dec., 1930. "Tree 25-40 ft. high, with very spreading branches, common in places in closed forest as understorey. White flowers and small round fruits."

Vernacular name (Ashanti): "Opahah" or "Opaha."

Gelonium occidentale Hoyle, sp. nov. [Euphorbiaceae-Crotoneae]; a congeneribus africanis foliis magnis subsessilibus obtuse caudato-acuminatis basi cordatis satis distincta.

Frutex parvus, glaber, usque ad 2 m. altus, ramulis tenuibus flexuosis fusco-viridibus sulcatis primum angulatis. *Folia* in sicco viridia, sessilia vel brevissime petiolata, 10-18 cm. longa, 3.5-8 cm. lata, oblanceolata vel obovata vel oblongo-elliptica, apice plerumque abrupte et obtuse subcaudato-vel breviter acuminata, basi rotundata vel subcordata, utrinque laxa et subprominenter reticulata et inter venas glanduloso-vesiculata; nervi laterales praecipui utrinque 5-8, oblique patentes, 3-5 mm. intra marginem arcuatim conjuncti. *Flores* ♂ pauci, subsessiles, plerumque 3-6 pro fasciculo, foliis oppositi. *Sepala* 5 vel 6, eglandulosa, orbiculata, 3 externa subcoriacea 3 mm. diametro, 2-3 interna minora, membranacea, petaloidea. *Stamina* 20-30; antherae oblongae, 1 mm. longae; filamenta aequilonga, circa et in disco favoso inserta. *Flores* ♀ 1-2 pro fasciculo (alabastra tantum visa). *Sepala* verisimiliter 3+3, externa valde imbricata, cucullata, interna minora membranacea petaloidea, leviter ciliolata. *Discus* inconspicuus, membranaceus, crenulatus, staminodiis minutissimis inter crenaturas dispositis. *Ovarium* 3-loculare, glabrum, stylis 2-fidis in alabastro incurvis. *Fructus* tricoccus, circiter 1.4 cm. diametro, viridis,

glaber, depresso 3-lobatus, lobis rotundatis, coccis ab axe persistente separantibus.

WEST TROPICAL AFRICA. Gold Coast: Mampong Scarp, 1,600 ft. altitude, C. Vigne 2754 (♂) type, with flowers Feb., 1933, 2755 (♀) with flowers and fruits Feb., 1933, in Kew herb. and Imperial Forestry Institute herb., Oxford; Ofin Headwaters Reserve, 1,500 ft. altitude, C. Vigne 3124 (♂) with flowers, October, 1933. "Shrub 6 ft. high, undergrowth in closed forest."

Grossera Vignei Hoyle, sp. nov. [Euphorbiaceae - Crotoneae]; affinis *G. macranthae* Pax, a qua panicularum ramulis pedicellisque tenuioribus, floribus omnino minoribus, sepalis petalisque minoribus, petalis tenuiter membranaceis subintegris glabris, disco filamentisque fere glabris, recedit.

Arbor 5-15 m. alta, ramulis novellis brunneo-purpureis primum fulvo-tomentosis vel pubescentibus mox fere glabris. *Stipulae* minutae, lanceolatae, caducae. *Petoli* longiusculi, 2-7 cm. longi, apice pulvinati, latere inferiori dense pubescentes. *Folia* tenuiter coriacea, 8-30 cm. longa, 3-12 cm. lata, oblanceolata vel obovata vel elliptica, apice obtusa vel obtuse acuminata, basi haud prominenter glandulosa, anguste vel obtuse cuneata, margine distanter dentibus glandulosis crenato-serrata vel rare subintegra, supra glabra, infra praeter costam glabra, laxa reticulata, glanduloso-pustulata; nervi laterales utrinque 8-11, arcuati, infra cum costa prominentes. *Paniculae* terminales et axillares, usque ad 22 cm. longae, ramis oblique adscendentibus infimis ad 18 cm. longis, fulvo-tomentosae vel pubescentes. *Flores* ♂ in ramis fasciculati; bracteae ovato-rotundatae, circiter 1 mm. diametro, extra tomentellae; pedicelli 3-6 mm. longi, tenues, puberuli. *Calyx* 3-4-partitus; segmenta subaequalia, circiter 2 mm. longa, ovata vel late ovata, membranacea, extra puberula, intus glabra. *Petala* irregulariter obovato-rotundata, 1 mm. diametro, tenuiter membranacea, glabra, margine inconspicue ciliolata. *Disci* glandulae 5, antheris sessilibus multo commutatis complanatisque similes, glabrae. *Stamina* 13-16, intra discum in receptaculo convexo leviter pubescente disposita, 2-3 mm. longa. Nec flores ♀ nec fructus visi.

WEST TROPICAL AFRICA. Gold Coast: Ashanti, Ofin Headwaters Reserve, C. Vigne, 1915, type, in Kew herb. and Imperial Forestry Institute herb., Oxford, with flowers April, 1930; Abofaw, C. Vigne 3135; Tano-Ofin Forest Reserve, F. J. Lyon 2862; Mampong Scarp, C. Vigne 2752; Southern Scarp Reserve, Mrs. H. W. Moor 1152; Bosusu, Mrs. Moor 345.

Variously described as: "Small tree 15 ft. high"; "Small tree 20 ft. high and 1 ft. girth, understorey in forest, white flowers"; "Small tree, deciduous forest"; "Small tree 25 ft. high and 2 ft. girth, understorey in forest"; "Tree 50 ft., pale yellow flowers." Collected with flowers or flower-buds at various times from January to December, and with open flowers in December and April. Leaves said to be used as medicine (Mrs. Moor).

Vernacular names : "Dubrafo" (Ashanti and Twi) ; "Mpeoro" (Ashanti).

Dalbergia glandulosa Dunkley, sp. nov. [Papilionaceae] ; affinis *D. albiflorae* A. Chev. ex Hutch. et J. M. Dalz., sed inflorescentia multo brevior paullo ramulosa, stipulis conspicuis falcatis, ramulis junioribus glandulosis et fulvo-pubescentibus differt.

Frutex scandens ; partes juniores pilis fulvis atque glandulis instructae. *Petiolis* 1-1.5 cm., rhachides 4-8 cm. longae, dense fulvo-tomentosae demum pubescentes, glandulis persistentibus. *Stipulae* circiter 1 cm. longae, conspicue falcatae. *Folia* 7-9-foliolata ; foliola alternantia vel subopposita, petiolis 2 mm. longis, utrinque crebre reticulata, margine tomentoso-ciliata, supra tenuiter pubescentia, glabrescentia, infra sub-dense piloso-pubescentia, costa subtomentosa, nervis lateralibus utrinsecus 6-8 tenuibus arcuatis ; inferiora ovata, circiter 3 cm. longa et 2 cm. lata, basi rotundata, apice obtusa et conspicue mucronata ; superiora obovato-oblonga, usque ad 7 cm. longa et 3-7.5 cm. lata, apice rotundata vel retusa, apiculata, basi rotundata vel brevissime cuneata. *Paniculae* breves, axillares et terminales, 4-8 cm. longae, dense fulvo-pubescentes et glanduloso-pilosae, ramulis 2-4 usque ad 2 cm. longis ; bracteae et bracteolae subpersistentes, conspicue tomentellae, 2-3 mm. longae ; pedicelli brevissimi. *Calyx* 4 mm. longus, extra breviter rufo-tomentosus, intus glaber, dentibus ovato-acutis 1.5 mm. longis. *Petala* glabra, 7 mm. longa, longe unguiculata, unguibus 2 mm. longis ; vexillum orbiculatum, emarginatum, 5 mm. latum ; alae obovato-oblongae, basi truncatae vel leviter appendiculatae ; carina naviculariformis, 2.5 mm. longa. *Stamina* 10, in vaginam supra fissam connata. *Ovarium* pilosum, longe stipitatum, stigmatibus parvo. *Fructus* stipitatus, compressus, coriaceus, seminibus elevatis, usque ad 9 cm. longus et 2 cm. latus, lanceolatus vel oblongus, apice atque basi acutus, fulvo-tomentosus et valde glanduloso-pustulatus. *Semina* 1-2, biconvexa, reniformia, circiter 10 mm. longa, 5 mm. lata, 3 mm. crassa.

SOUTH TROPICAL AFRICA. Northern Rhodesia : Bombwe, J. D. Martin 161 (flowers), 687 (fruits), type, in Kew herb. and Imp. For. Inst. herb., Oxford, "woody, many-stemmed climber," coll. Dec., 21st., 1931 (flowers), April 1933 (fruits) ; Livingstone District, Siburu, D. Stevenson 1, "small tree" ; Sichifura, D. Stevenson 170. Southern Rhodesia ; Wankie, B. Levy 106, Flowers Dec. 1934, fruits Feb. 1935.

Vernacular names : "Mukonkoto" (Chitoka) ; "Muwunda" (Sikololo).

Pterocarpus Martinii Dunkley, sp. nov. [Papilionaceae] ; affinis *P. rotundifolius* (Sond.) Druce, sed staminibus longioribus, calycis tubo extra puberulo, fructu dense fulvo-tomentoso, foliolis pluribus plerumque minoribus satis distincta.

Arbor parva, trunco circiter 30 cm. diametro, ramulis incano-puberulis ; petiolus 3-5 cm. longus, rhachis 11 cm., dense sericeus. *Folia* 11-13-foliolata, circiter 16 cm. longa ; foliola opposita vel subopposita, oblongo-ovata vel suborbiculata, subcoriacea, basi rotundata, truncata vel brevissime cuneata, apice obtusa et retusa vel rarissime rotundata, 4-6 cm. longa, 3-5 cm. lata, supra pubescentia, infra dense griseo-sericea, costa prominente ; nervi laterales utrinsecus 6-8 ; petioluli 5-7 mm. longi. *Paniculae* terminales, 15-20 cm. longae et latae, ramis patentibus dense pubescentibus. *Flores* 1.5 cm. longi. *Calyx* 7 mm. longus, extra pubescens, subpersistens, dentibus acutis, tubo intus glabro. *Petala* flava, vexillo 7.5 mm. lato. *Stamina* monadelphia, tubo 7 mm. longo. *Ovarium* dense sericeum, stipite 5 mm. longo ; stylus glaber. *Fructus* submaturus, sicco pallide brunneus, irregulariter subfalcato-ellipticus, fulvo tomentosus, circiter 5 cm. longus, 3.5 cm. latus, stylo minute persistente subterminale, alis coriaceis. *Semina* 2, complanata, semi-elliptica, 6-7 mm. longa.

SOUTH TROPICAL AFRICA. Northern Rhodesia : Bombwe, J. D. Martin 524 (flowers), 563 (fruits), type, in Kew herb. and Imperial Forestry Institute herb., Oxford ; leaves first collected in June 1932, galled flowers in December 1932, complete flowering and fruiting material collected from the same tree in Feb. 1933, "a small tree in mopane, S.W. forest boundary on Kalahari sand" ; Mazabuka District, Pemba, on red sandy loams derived from mica schists, 4500 ft., March 1933, Trapnell 1186, "small tree to 35 ft. high ; bark rough, furrowed." Southern Rhodesia : Lomagundi, 22 April 1929, Eyles 6334.

Vernacular name : "muLianzovu" (Chitoka).

Ekebergia velutina Dunkley, sp. nov. [Meliaceae] ; affinis *E. benguelensi* Welw., a qua ovarii loculis 2-ovulatis, paniculis majoribus, rhachide et petiolo longioribus, foliolis dense sericeis, haud utrinque glabris, recedit.

Arbor mediocris ; partes juveniles primum velutinae ; ramuli mox glabrescentes. *Folia* imparipinnata, 15-18 cm. longa, petiolo 4-5 cm. longo complanato, rhachide 14-16 cm. longa, petiolulis circiter 4 mm. longis ; foliola utrinsecus 4-5, opposita vel subopposita, 5-8 cm. longa, 2.5-3 cm. lata, oblonga vel ovato-oblonga, apice breviter apiculata, rotundata vel truncata vel obtusa, basi late cuneata vel rotundata, margine reflexo, supra olivaceo-viridia et breviter pubescentia, subtus molliter griseo velutina, costa utrinque subprominente, nervis lateralibus utrinsecus circiter 12. *Paniculae* usque ad 15 cm. longae, 6 cm. latae. *Flores* velutini. *Sepala* ovata, extra puberula, intus glabra, 2 mm. longa. *Petala* oblonga vel ovato-oblonga, puberula, 7 mm. longa. *Tubus stamineus* puberulus, 4 mm. longus. *Antherae* falcatae, glabrae. *Discus* obscure 5-lobatus. *Ovarium* triloculare ; ovula in loculis 2. *Stylus* crassus, puberulus, 2 mm. longus. *Drupa* 1.5 cm. longa, 1 cm. diametro. *Semina* 1-2, reniformia, 8 mm. longa, 7 mm. lata.

SOUTH TROPICAL AFRICA. Nyasaland: Mlanje District, Tuchila Plain, *P. Topham* 910, type, in Kew herb. and Imperial Forestry Institute herb., Oxford; "on well drained ground, uncommon"; near the Likabula timber depot, Mlanje, *J. B. Clements* 125, Oct. 1929; Zomba, 2700-3000 ft., *J. M. Purves* 233, Nov. 1915. Northern Rhodesia: Lundazi, *D. Stevenson* 87, "medium tree," Sept. 1929.

Vernacular names: "Mututumuku" (Yao), "Musefu" (Chin-senga), "Mutumuko."

Diospyros Vaughaniae *Dunkley*, sp. nov. [Ebenaceae]; affinis *mespiliformi* Hochst., a qua corolla glabra, staminibus 20, staminodiis pluribus, floribus et foliis minoribus, calyce fructus majore recedit.

Arbor parva, circiter 6 m. alta, alabastris, foliis juvenilibus, et fructibus immaturis viscosis; ramuli glabri cortice lenticellato cinereo. *Folia* glabra, rigide coriacea, oblonga vel oblongo-orbiculata, 4-6 cm. longa, 3-4 cm. lata, apice rotundata vel obtusa, basi late cuneata, supra olivacea, subtus pallide brunneo-grisea, nervis lateralibus utrinque 8-10 supra parum impressis subtus cum costa subprominentibus, margine integra revoluta; petiolus 4 mm. longus, supra canaliculatus. *Flores* sessiles, dioici, glutinosi, in axillis solitarii. *Calyx* coriaceus, urceolatus, extra minute furfuraceus, intus glaber, breviter 4-dentatus. *Corollae* tubus e calyce paulo exsertus; *lobi* 4, contorti, glabri. *Flores* ♂: stamina 20, per paria connata; antherae lanceolatae, biloculares, basifixae, 2 mm. longae, poris apicalibus dehiscentes; filamenta 0.5 mm. longa; ovarii rudimentum minute pilosum. *Flores* ♀: staminodia circiter 10; ovarium glabrum, 8-loculare; ovula in loculis 1; stylus 4-furcatus. *Fructus* glaber, oblongo-ovoideus, 2.5 cm. longus, 1.5 cm. latus, breviter pedicellatus; calyx fructu accrescens et hypocrateriformis, 2 cm. latus, tubo circiter 1 cm. longo. *Semina* 5, oblonga, 1.2 cm. longa, 4 mm. lata, testa coriacea.

EAST TROPICAL AFRICA. Zanzibar: *J. H. Vaughan* 699, type, in Kew herb., "tree with sticky buds and acorn-like fruits"; *Vaughan* 1492, 1545, 1931; *Kirk*, s.n.; Pwani Mchangani, *Greenway* 1198, "a tree 20 ft. high, spreading branches, fruits very sticky." Jan. 26th, 1929. Pembe Islet, off Pemba Island: in the xerophyte fringe above, or at high water mark, *Burtt Davy* 22455, 22576, "a low straggling tree, apparently unhealthy and out of its element," Oct. 11th, 1929. Kenya Colony: Witu, *St. Barbe Baker* 60.

The specimen collected on Pembe Islet was growing at the lower fringe of the xerophytic scrub on the sea-shore, almost at high-water mark, in an extremely hot locality, very dry except for the proximity of salt water. The pale colour of the leaves, and the tendency to curl under, in an irregular manner, gave the impression that the tree was unhealthy and growing out of its element. Mr. and Mrs. J. H. Vaughan have since found the species

in several places on the Zanzibar coast, where it is not uncommon in the "coral rag" country, though local in its distribution. They state that the irregularly revolute leaf-margins are characteristic of the species. The fruit seated in its persistent calyx forcibly recalls a young acorn in its cup.

J. B. D.

Strychnos bicirrifera *Dunkley*, sp. nov. [Loganiaceae]; affinis *S. matopensi* S. Moore, a qua calycis segmentis longioribus, stylo pubescente longiore, cirris geminatis circinnatis longe stipitatis, foliis basi rotundatis (haud cuneatis) differt.

Frutex scandens, cirris geminatis circinnatis, ramulis striatis cum petiolis et ramis floriferis molliter puberulis. *Folia* coriacea, circiter 4 cm. longa, 3 cm. lata, ovata vel latissime ovato-lanceolata, apice acuta, apiculata, basi rotundata vel breviter cordata, supra glabra, nitida, infra glabra sed in costa pubescentia, nervis 3 vel 5 arcuatis a basi orientibus et supra et subtus aequaliter prominentibus manifeste reticulatis, petiolo tumido crasso 2-3 mm. longo. *Cymae* axillares terminalesque, circiter 10-florae, bracteis geminatis deltoideis 1 mm. longis, pedicellis et pedunculis puberulis 4-6 mm. longis. *Flores* fragrantis, albi, in medio fusci, 4 mm. longi. *Sepala* 5, ovato-lanceolata, ciliata, 1.5 mm. longa. *Petala* 5, oblonga, acuta, 3-costata, extra glabra, intus ad basin longe pilosa, tubo brevissimo vix 1 mm. longo. *Stamina* 5, antheris basifixis inclusis. *Ovarium* minute puberulum, 2-loculare. *Ovula* in loculis numerosa. *Stylus* 3 mm. longus, stigmatibus integro. *Fructus* non visus.

EAST TROPICAL AFRICA. Kenya Colony: Malindi District, Arabuko, *R. M. Graham* 2290, type, in Kew herb. and Imperial Forestry Institute herb., Oxford, with flowers, March 1930, "scandent shrub forming part of the undergrowth in *Brachystegia* forest. Flowers, white with a blackish centre, strongly scented of nutmeg. Leaves abundant, causing dense patches of vegetation in which a puff-adder [Bafe] might be expected to live." Arabuko, *R. M. Graham* 1854, "part of bushy secondary growth after forest has been cut down."

Vernacular name: "mbugu-bafe" (Swa.).

Belonophora coriacea *Hoyle*, sp. nov. [Rubiaceae-Albertae]; affinis *B. lepidopodae* Hutch. et J. M. Dalz., a qua stipulis latioribus nec subulato-acuminatis, bracteis et calyce majoribus, foliis, bracteis et floribus coriaceis, foliis ellipticis recedit.

Arbor (?) riparia, praeter inflorescentiam glabra, ramulis novellis primum viridi-cinereis striatis, nodis complanatis, in ramis annottinis cortice cinereo vel pallide fulvo-cinereo nodis tumidis. *Stipulae* 1-1.5 cm. longae, 2-5 mm. latae, coriaceae, oblongo-lanceolatae vel ellipticae, obtusae, variabiles. *Folia* coriacea, elliptica vel lanceolata-vel oblongo-elliptica, 10-27 cm. longa, 3.5-10 cm. lata, apice breviter acuminata, basi cuneata et in petiolo decurrentia, costa et nervis utrinque prominulis venis inconspicuis; nervi laterales

utrinque 5-6. *Flores* solitarii vel fasciculati, axillares vel in axillis foliorum delapsorum, subsessiles; pedicelli bracteosi, circiter 1 mm. longi; bractee coriaceae, orbiculares, 2-2.5 mm. diametro, in sicco longitudinaliter striatae, ciliatae, fructu persistentes et paulo accrescentes. *Calyx* alte 5-lobatus, fructu accrescens; lobi 5, bracteis similes, valde imbricati, ciliati; tubus 1 mm. longus, ovario haud superans, extra irregulariter tomentosus. *Corollae* tubus in alabastro 12-13 mm. longus, 2.5 mm. latus, extra puberulus; lobi 5, 10 mm. longi, 3.5 mm. lati, oblongi, obtusi, extra puberuli, intus glabri, ciliati. *Antherae* lineares, 6 mm. longae, sessiles, medifixae 3 mm. infra ore corollae, connectivo deltoideo. *Discus* magnus, depresso-globosus, ater. *Ovarium* biloculare; ovula pro loculo 1, pendula; stylus 6 mm. longus, ramis 2 in alabastro contortis. *Fructus* baccatus, globosus, subcoriaceus, sparse pubescens, circiter 1.5 cm. diametro, calycis lobis late deltoideis in annulo lato sub apice dispositis. *Semina* 1 vel 2, plano-convexa, rotundata, brunneo-sanguinea, rugulosa, 8-10 mm. diametro.

WEST TROPICAL AFRICA. Nigeria: Mamu River, *J. D. Kennedy* 2542, type, in Kew herb. and Imperial Forestry Institute herb., Oxford, with flowers and fruits; Sapoba (Jamieson River) *Kennedy* 2279 with fruits, 1852 with flowers and young fruits.

Vernacular name: (Yoruba?) "Igbakue izigha."

Sabicea rosea Hoyle, sp. nov. [Rubiaceae-Mussaendeae]; a *S. cordata* Hutch. et J. M. Dalz. calycis lobis brevioribus haud subulatis, foliis basi cuneatis; a *S. bracteolata* Wernh. floribus longioribus piloso-hirsutis, calycis lobis latioribus obtusioribus, calyce et ramulis sparse pubescentibus, recedit.

Frutex scandens, tenuis; ramuli novelli brunnei, teretes, leviter striati, pilis adpressis nonnullis reflexis setuloso-pubescentes. *Stipulae* 4 mm. longae, deltoideae, acutae vel breviter acuminatae, adpresso-puberulae, deciduae. *Petoli* tenues, 1-3 cm. longi, latere superiore densissime, latere inferiore sparse setulosi. *Folia* chartacea, elliptica vel rare obovata, 5-9 cm. longa, 3-4.5 cm. lata, apice breviter acuminata vel acuta, basi cuneata, margine ciliata, supra atro-viridia et sparse setulosa, costa dense setulosa, subtus pallidiora costa nervisque fuscis, praecipue in costa et nervis setulosa, tenuissime reticulata; nervi laterales utrinque 9-12, valde arcuati, prope marginem crebre conjuncti. *Cymae* 1-4-florae, sessiles, axillares in ramulis novellis foliatis vel annotinis nudis; bracteolae parvae, ovatae, puberulae, ovarii basin amplexantes. *Flores* sessiles. *Calycis* tubus praeter ovarium 1 mm. longus, breviter turbinatus; lobi virides, herbacei, 2.5 mm. longi, ovati, acuti, extra puberuli, ciliati. *Corolla* puniceo-brunnea, fusco-maculata; tubus 2 cm. longus, basi tenuis, dimidio superiore dilatatus, extra pilis roseis patentibus dense hirsutus sed basi glaber, intus infra ore pilosus; lobi 5, deltoideo-ovati, acuti, 3 mm. longi, extra brunneo-hirsuti, intus glabri. *Antherae* lineari-oblongae, sagittatae, 2.5 mm. longae, in ore corollae sessiles et partim exsertae. *Ovarium* turbi-

natum, 2 mm. longum, obtuse adpresso-puberulum, 5-loculare, ovulis numerosis. *Stylus* lobis exceptis 17 mm. longus, inclusus; lobi 4 (vel 5?) filiformes, 2 mm. longi, stigmatibus lineari-oblongis complanatis 1 mm. longis. *Fructus* non visus.

WEST TROPICAL AFRICA. Gold Coast: Western Province, Boinsu, 300 ft. altitude, *C. Vigne* 3190, type, in Kew herb. and Imperial Forestry Institute herb., Oxford, with flowers December 1933, "red-flowered climbing shrub in forest."

XXIII—THE NATIONAL PINETUM AT BEDGEBURY AND ITS ORIGIN.

In 1922 informal conversations, which had been in progress for some years, led to definite proposals for the establishment of a new National Pinetum to replace the Conifer Collection at Kew, as this was rapidly deteriorating through the combined influences of poor, dry soil and increasing atmospheric impurities.

Hitherto, the initial cost of such an undertaking had prevented progress, and the question had not been submitted for official departmental consideration. However, with the advent of the Forestry Commission and the acquisition of land for afforestation, interested officials, amongst whom Sir John Stirling-Maxwell, Bart., K.T., was prominent, suggested that it might be possible and of mutual advantage to Kew and to the Forestry Commission, to set aside an area of Forestry Commission land whereon a National Pinetum could be formed.

In order to place the suggestion upon an official foundation a letter dated May 18th, 1922, was written by Mr. Roy (now Sir R. L.) Robinson of the Forestry Commission to Dr. (now Sir Arthur) Hill, as follows:—"I understand indirectly that you have been considering the desirability of finding a site for an Arboretum away from Kew, which is unsuitable for many coniferous species. Perhaps we could help in this respect, as we now have estates all over the country and could spare the relatively small area which would be required for the purpose." The letter was followed by a discussion on possible sites, and in May 1923 several positions in Surrey, near Churt and Bramshill, were examined. They were not regarded as being altogether suitable, and further correspondence led to a suggestion from the Forestry Commission that a visit should be paid to Bedgebury Park, an estate in Kent that belonged to the Office of Crown Lands, the woodlands of which, it was expected, would shortly be transferred to the Forestry Commission. A preliminary examination led to a favourable impression being formed of the possibilities of a site on the estate, and a subsequent more careful survey of several positions confirmed the first impression that the ground was eminently suitable for the cultivation of most kinds of conifers.

Eventually an area of about 50 acres was selected on the Goudhurst side of the estate immediately around Park House, the residence of the estate gamekeeper, about 4 miles from Goudhurst and 12 miles from Tunbridge Wells. This area was made up of undulating ground rising about 70 feet from the lowest point, Marshall's Lake, a pleasant sheet of water on the boundary, backed by a decorative plantation of mixed conifers of considerable size with *Rhododendron ponticum* as undergrowth. The crops on the ground consisted partly of good mature Scots pine about 120 years old, partly of Chestnut coppice with Oak, Holly and ornamental conifers as standards, two small areas of young larch plantations, one Japanese the other European, a corner of a mixed plantation of Douglas fir and other species, and several acres of wet ground carrying thin birch and alder coppice.

The ground generally was good, varying from deep loam to shallow loam over a hard pan covering reasonably good soil of a light clayey nature. In other places a thin layer of peat covered a hard pan of sandy clay which on exposure broke up into reasonably good soil. There were numerous springs about the area and at one time the ground had been well drained, but many years of neglect had resulted in open ditches being filled in with decaying vegetable matter and pipe-drains becoming hopelessly disorganised. However, growing amongst the oak coppice were numerous conifers 60-100 feet high, such as *Abies grandis*, *A. nobilis*, *Pseudotsuga Douglasii*, *Sequoia gigantea*, *S. sempervirens*, *Tsuga heterophylla*, *Picea sitchensis*, etc., all in excellent health, which denoted the general suitability of the land.

Steps were then taken to obtain the approval of the Ministry of Agriculture and Fisheries for the project, and the sanction of the Treasury for the funds required for maintenance. As very strict national economy was necessary at the time, the Forestry Commission and Kew arranged to carry out as much as possible of the preliminary work of ground preparation, provision of plants and planting, without any addition to their 1924-25 grants. Thus the Forestry Commission agreed to fell the trees and coppice-wood, dispose of the timber, fence the ground, and provide labour for planting; Kew to provide the plants, supervise planting, and take all responsibility for listing, labelling and generally looking after the growing trees. After this work was done maintenance for the first few years was estimated at £100 a year, the expenses being divided on a 50 per cent. basis between the Forestry Commission and the Ministry of Agriculture and Fisheries.

Unfortunately the work could not be pushed on as rapidly as had been hoped, and by the middle of March, 1925, less than one fifth of the area was available for planting, and that was littered with tree-trunks and cord-wood.

Certain plants had been ordered and had to be paid for before the end of the financial year, many were ready for removal from the

nursery at Kew, and others had been presented by Lord Wakehurst (then Mr. G. W. E. Loder) and Mr. F. R. S. Balfour. Planting, therefore, had to be undertaken with the timber lying on the ground, which in some cases prevented the allocation of ground to the best advantage. Species of *Abies*, *Larix*, *Tsuga*, *Thuja*, *Cunninghamia* and *Pseudotsuga* were put in at that time, but the greater part of the planting had to be postponed until the following autumn. As it was impossible to fence before the ground was cleared, every plant put out in March, 1925, had to be encircled by wire netting. Unfortunately as summer advanced it was found that the rest of the ground could not be cleared for planting during the autumn of 1925, and work was still further delayed by a very wet winter. Throughout the winter, heavy timber was being carried over badly bottomed roads and they became deeply rutted and covered by several inches of sloppy mud. Planting was carried out in February, 1926, and there was rain every day during the first three weeks. There was still a good deal of timber lying about, and where it had been hauled the ground was deep in mud. Planting could not be deferred since the work had to be done before the end of the financial year. As the roads were so bad all plants had to be dumped some distance from the places they were to occupy. The roots of many were balled and weighed anything from two or three to more than twenty pounds. They had to be carried from 200 yards to over a quarter of a mile and there were over 700 of them. The journey in some cases meant crossing several ditches and two or three roads covered deep in mud. In some instances holes dug for plants became filled with water and had to be baled out before planting could be done. This is one of the disadvantages of being compelled to work to a timetable. Had it been possible to retain the available money and postpone planting until the following autumn, it would have been better for all concerned, but that could not be done. Provision had been made for that financial year but not for the one following.

As it was, difficulties arose over the postponement of the fencing. When it was done there was no money available, and in the end it was necessary to go to the Treasury for an increased grant, which was ultimately obtained. The annual grant for labour and all other commitments was eventually raised to £300, which was maintained until the financial year 1934-35 was reached. Then, as other obligations arose, the grant was raised to £450.

On February 1st, 1924, a meeting was held between Mr. Bean of Kew, and the late Mr. Pritchard and Dr. Borthwick of the Forestry Commission, for the purpose of discussing preliminary arrangements and making suggestions for future management. Amongst other items the possible acquisition of Park House was discussed and the following paragraph occurs in the report of the meeting. "It is understood that if Park House becomes a dwelling for a forester, a room would be available where books and other information could be consulted and studied by those interested in

the subject." Although the necessity for such a room was frequently urged, it was not until 1933 that the house became available for a Forestry Commission Forester and it was then possible to allocate accommodation for the work of the Pinetum Committee. In the meantime the only shelter available was a small tool-shed.

Although much of the earlier planting was carried out under such unfavourable conditions the young trees grew well and would have succeeded much better than they did had it not been for severe May frosts in 1926, 1927, and 1928, which cut the young shoots of many species of *Abies*, *Picea*, and *Tsuga* hard back. Some recovered during 1929 but others had to be replaced. There was also a good deal of harm done by pine-weevils (*Hylobius abietis*) to young pines, by species of *Dreyfusia* to *Abies* and by green spruce-aphis to *Piceas*. Pine-weevil disappeared after the first three years but, despite regular spraying, the other two pests have continued with more or less virulence up to the present time. The pests are apparently constantly spread to small trees from large trees in the vicinity. Several other pests and diseases have also caused trouble, but such difficulties are to be expected when planting is carried out in old forest land. Honey fungus (*Armillaria mellea*) has killed a number of fine young trees, and several five-leaved pines were killed by *Cronartium ribicolum*.

On the other hand, although larch-canker fungus (*Dasyscypha calycina*) is prevalent in a plantation 200 yards away from where the larches are growing, only a few small patches of this disease have been noted on the young trees. Apparently well-worked ground and wide spacing had a beneficial effect.

Whenever possible six plants of a species and three of a variety have been planted. All large-growing kinds were spaced 20 to 24 feet apart and so arranged that one or two could be cut out at some future date if necessary. Holes were made 3 feet across, and 1½ feet deep with the bottom dug up. For the first five or six years open circles were maintained round each tree, but as the trees acquired strength and size cleaning has been reduced until now the larger ones are left to take care of themselves.

It was soon found that the old drains would have to be opened and new ones made to prevent some parts of the ground becoming too wet, for a few of the larger trees were deteriorating through wet ground. Draining and the erection or repair of rustic bridges created a good deal of work. Much cutting out of overgrown rhododendrons, of dead branches from large trees, and of young shoots from coppice stools has had to be undertaken.

From the start records have been kept of all plants, and every plant has been labelled with its name, country of origin and index number. Additions to the number planted in 1925-26 have been made each year since, and besides conifers a number of broad-leaved trees and shrubs have been planted in the vicinity of Park House. A large number of evergreen species and varieties of *Rhododendron* have been planted between the conifers, and an effort is

being made to establish deciduous rhododendrons over a considerable area of ground, for the combined purpose of checking ground-vegetation that is easily fired in dry weather and of providing a display of flowers at little or no cost. In other parts masses of mountain pine are being formed to take the place of grass and bracken. Surplus water-lilies were taken from Kew and planted in Marshall's Lake, and these, during 1933 and 1934, flowered remarkably well and created considerable interest in the neighbourhood.

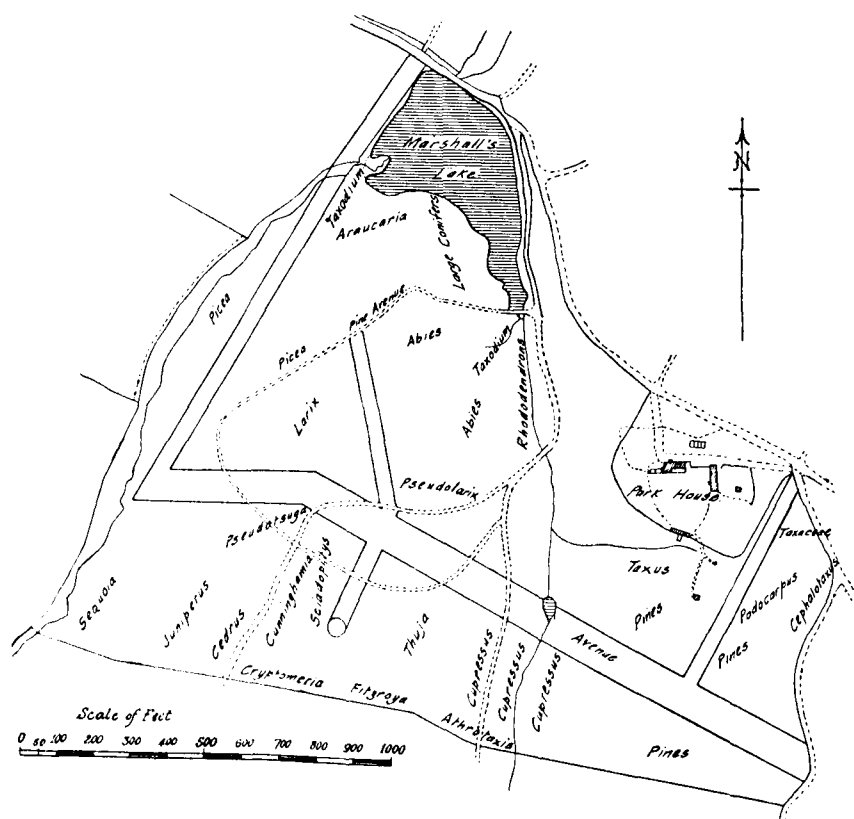
A good deal of natural regeneration of trees has gone on since the crop was cut in 1924 and 1925. Large numbers of Scots pine, Lawson cypress, Sitka spruce, Douglas fir, holly, *Abies grandis*, *Thuja plicata* and other species have appeared from naturally sown seed, and provision has been made for the retention of many of these interesting seedlings.

Some of the small trees planted in 1925 and 1926 are now over 20 feet high, and the problem arose two or three years ago as to whether those that eventually grow into large trees should be pruned to form a definite length of clean trunk, or whether they should be allowed to retain their branches to the ground line. A decision was made in favour of pruning, and species of larch, the larger-growing pines, Douglas firs, etc. are being pruned, the idea being to obtain a length of about 12 feet of clean trunk while the diameter is small, and then to allow the branches to develop naturally. Where the branches are unlikely to droop low enough for the branchlets to be handled from the ground, the branches of one or more trees of that species will be left lower on the trunk for purposes of close examination.

The land immediately around Park House, when transferred with the house in 1933, was in a derelict state and very untidy, with large masses of nettles, docks and other coarse weeds. This has been cleaned up, several old trees removed and others cleared of dead wood. Numerous trees and shrubs have been planted, a new entrance to the Pinetum made, and an area of level ground sown with grass seed. Rooms in Park House given over for the work of the Pinetum have been repaired, redecorated and furnished, and herbarium cabinets have been installed. A nucleus of a conifer herbarium and library has been formed. Several dilapidated sheds have been repaired for use as tool-sheds and a messroom for men working in the Pinetum and adjacent forest.

The accompanying plan gives an idea of the lay-out of the ground with the placing of the different genera. Several avenues have been arranged for the convenience of visitors. No attempt will be made to keep these avenues closely mown. Heather and ling are encouraged to grow and the whole arboretum will be developed in a natural or informal manner, tracks being cleared to the various genera during summer, general mowing being carried out once or twice a year.

Unfortunately a violent storm occurred on November 16th, 1928, which blew down 30 of the finest specimen trees, many of them



Plan of the National Pinetum at Bedgebury.

70 to 90 feet high, and injured others. They grew where the water table was high and their roots had spread over a wide area but were usually less than 15 inches deep. The dry years of 1933-1934 have not injured any of the young trees although practically all the springs, drains, and water-courses dried up. Although only about 55 miles from Kew the 1934 rainfall at Bedgebury was double that experienced at Kew.

Low ground at Bedgebury is subject to frost, and not infrequently 4 or 5 more degrees of frost are experienced in low places than on higher ground 200 yards away.

Near the Pinetum, the Forestry Commission have established 40 acres of experimental forest plots laid out chiefly in quarter-acre sections. These contain species not usually planted under forest conditions and various races for comparison with well-known forest trees.

Visitors who are genuinely interested in conifers and other trees are welcomed in the Pinetum at Bedgebury, but they are asked to respect the few restrictions placed upon visitors as given on the

notice boards. Should they wish for information they should approach the Keeper, Mr. W. Castle, at Bedgebury, or write to the Director, Royal Botanic Gardens, Kew. The Forester, Mr. Nelmes, living in Park House, and the Keeper have authority to act in the event of persons disobeying regulations, or acting in any way that is likely to be detrimental to the interests of the Pinetum.

XXIV—TROPICAL AFRICAN PLANTS : XIII.*

Triplochiton zambesiacus Milne-Redhead, sp. nov. [Sterculiaceae]; a *T. scleroxylo* K. Schum. inflorescentibus paucifloris, bracteolis sub anthesin persistentibus, floribus majoribus, androgynophoro pro rata longiore, staminibus numerosissimis valde distincta. Masters in Oliv. Fl. Trop. Afr. 1, 239 (1868), sine nomine.

Arbor usque 18 m. alta e basi furcata, ligno ignoto. *Ramuli* graciles, teretes, glabri. *Folia* decidua, vel fere sempervirentia, palmatim 5-9-lobata, cordata, petiolata; lamina usque 12 cm. longa et 14 cm. lata, lobis ovatis vel oblongis breviter acuminatis subacutis, basi ad venas pilis stellatis densiuscule induta, ceterum glabra; folia immatura sparse stellato-hirsuta; petioli usque 4 cm. longi, sparse stellato-hirsuti, demum glabri; stipulae mox deciduae. *Inflorescentiae* 1-4-florae, axillares vel terminales; pedicelli usque 1.5 cm. longi, sparse stellato-hirsuti; bracteae deciduae, ovatae, obtusae, concavae, usque 8 mm. longae, sparse stellato-hirsutae; bracteolae 3, late ovatae, sessiles, infra calycem involucrum formantes, sub anthesin persistentes. *Calyx* late infundibuliformis, circiter 2 cm. longus, lobis 5 deltoideis acutis circiter 8 mm. longis et 7 mm. latis, extra pilis stellatis dense tomentosus, intus velutinus. *Petala* 5, plus minusve late obovata, leviter concava, apice rotundata vel submarginata, basi conspicue unguiculata, circiter 3.5 cm. longa et 2.5 cm. lata, appendicibus basi laminae circiter 1 mm. longis inconspicuis, utrinque pubescentia, ungue glabro, intus supra unguem densissime hirsuta. *Discus* annularis, valde inconspicuus. *Androgynophorum* cylindricum, leviter angulatum, 9 mm. longum, 3 mm. diametro, superne dense adpresse hirsutum, inferne glabrum. *Stamina* numerosissima (circiter 95); filamenta 6-8 mm. longa, per paria vel ternatim inferne coalita; antherae usque 2 mm. longae. *Staminodia* 5, aestivatione contorta, ovata, profunde concava, circiter 6 mm. longa, 4 mm. lata, scariosa, glabra. *Ovarium* ovoideum, 5-angulatum, circiter 5 mm. longum, dense hirsutum; stylus 2 mm. longus, pubescens; ovula 10-12 per loculum, biseriatim disposita. *Fructus* samaroideus, unilateraliter alatus, 2 cm. longus ala exclusa, densissime tomentoso-hirsutus, 1-spermus;

* Continued from K.B. 1934, 307.

ala obovovideo-oblonga, usque 7 cm. longa et 2.8 cm. lata; calyx et staminodia reflexa sub fructu persistentia, apice androgynophori densissime tomentoso-hirsuto.

SOUTHERN RHODESIA. Wankie District: Wankie, 750 m., March (fruit), Eyles 6960. Common around Wankie, Dec. 1934 (flowers), Eyles 8295 (type):—wood used for making yokes. Native name *Muzonzo*. Wankie, Feb. 1933 (flowers and fruit), Kelly Edwards 23/33 (Herb. Imp. For. Inst.). Wankie, Jan. 1933 (flowers), Levy 80 (Herb. Transv. Mus. no. 31116). Wankie, 8 July 1929 (fruit), Bremekamp s.n. (Herb. Transv. Mus. no. 27501).

NORTHERN RHODESIA. Mazabuka District? Country between the Kafue and the Batoka highlands, Zambezi Valley, July 1860, Kirk s.n.:—a tree of moderate size. On ant hills, fertile loams or sandy loams, on the fringes of Mopane country in Gwembe (Zambezi) Valley, 450 m., 1932, Macrae 5:—a 12 m. high sycamore-like tree with whitish bark, forked from the base, or growing with several stems together; leaves cooked as spinach by natives. Chitonga name *Mukunzu* or *Mukonza*. A big tree at Bagassa's Camp, Zambezi River Valley, Jan. 1930 (flowers), Browne 45/30 (Herb. Imp. For. Inst.):—native name *Mukonza*.

The genus *Triplochiton* was founded on a specimen collected in the Cameroons by Zenker and Staudt (no. 595) described as *T. scleroxylon* K. Schum. Three species, all from the West African forests, have since been described. *T. Johnsoni* C. H. Wright has been reduced to *T. scleroxylon*, whilst *T. nigericus* Sprague appears to the writer to be doubtfully distinct in the light of material recently collected by Kennedy in Southern Nigeria. *T. utilis* Sprague, described from fruiting material, is now referred by its author to *Tarrietia*.

Although a fruiting specimen of *T. zambesiacus* was collected by Sir John Kirk as long ago as 1860, and was described by Masters in the Flora of Tropical Africa as a probable member of the *Sterculiaceae*, it is only recently, through the co-operation of Mr. Eyles, that flowering material has been received at Kew, making possible the identification of this tree as a species of *Triplochiton*. The species here described extends the range of the genus very considerably.

Hibiscus Mastersianus Hiern in Cat. Afr. Pl. Welw. 1, 71 (1896) [Malvaceae]. *H. furcatus* Mast. in Oliv. Fl. Trop. Afr. 1, 201 (1868) pro parte, non Roxb. *H. pachmarhicus* Haines in Bull. Misc. Inform. Kew 1914, 24 (1914). *H. surratensis* L. var. *Mastersianus* (Hiern) Hochr. in Ann. Conserv. & Jard. Bot. Genève, 4, 112 (1900).

Hiern, when enumerating the species of *Hibiscus* collected by Welwitsch, found that the specimens cited under the name *H. furcatus* in the Flora of Tropical Africa (l.c.) were specifically distinct from the Indian plant, *H. furcatus* Roxb., and accordingly

proposed a new name for the African plant, which he published as *H. Mastersianus* in the Welwitsch Catalogue (l.c.), at the same time referring three of Welwitsch's specimens to this species. Hiern did not publish a description of *H. Mastersianus*.

Only two specimens are cited by Masters—"Gambia, Ingram and Zambesi, Tette, Kirk," and one of these must be taken as the type specimen of *H. Mastersianus* Hiern. These two specimens represent different species, the former, which is a leafy specimen in bud, is undoubtedly the common West African *H. rostellatus* Guill. et Perr., and does not agree well with the description. On account of its being in bud, the key characters of the relative lengths of peduncle to petiole and bracts to calyx are unreliable and the specimen falls into "*furcatus*" if Masters' key is used. The description is based almost entirely on the Kirk specimen, mature calyces and capsules not being present on Ingram's sheet. The "coarse bristly hairs or even tubercles" on the nerves of the leaves, and the linear-subulate, hispid, stipules are characters taken from *H. rostellatus*, and the description of the lobing of the leaves, whilst more or less applicable to both species, is probably taken from the Gambia plant. The other characters given are those of Kirk's specimen, the "very short peduncles" being the one of greatest importance, as it is by this character that *H. Mastersianus* is most easily distinguished from *H. furcatus* Roxb. The Kirk specimen is accordingly considered to be the type specimen of *H. Mastersianus* Hiern.

In 1914 Haines (l.c.) described a species of *Hibiscus* from the Central Provinces of India, which was said to be allied to *H. furcatus* Roxb., *H. radiatus* Willd., and *H. Mastersianus* Hiern. In his remarks following his description, he says "*H. Mastersianus* was founded on Dr. Welwitsch's sheets Nos. 4927, 4928 and 5242." This statement as will be seen from the above, is incorrect, as the Welwitsch specimens are only cited under *H. Mastersianus* by Hiern, who thought them to belong to that species, and they are not types. Haines does not appear to have seen the Kirk specimen, which is indistinguishable from his Indian *H. pachmarhicus*, but he saw Rogers 7007 from Northern Rhodesia, and agreed that it might be the same species. Further excellent material collected in Northern Rhodesia by Trapnell and in Tanganyika Territory by Burt agrees very well with *H. Mastersianus*. The Angolan specimens mentioned above, whilst very closely related, appear to me to be distinct from *H. Mastersianus* and may require a new name and description.

INDIA. Central Provinces: common in the middle Gondwana sandstones about Pachmarhi in the Satpura range, 900 m., Oct. 1911, Haines 197 P.

TANGANYIKA TERRITORY. Kondoa District: common in old cultivation and on waste land at Sambala, 1470 m., 28 March, 1929, Burt 2152: herb 1.2 m. high with yellow flowers. Manyoni District: in great "Higi-thicket" at Kazikazi, especially in glades of old

cultivation or after fire in the thicket, 1260 m., 14 May, 1932, *Burt* 3560: plant dwarfed in shade, but 2 m. high in open; flowers canary-yellow with sienna-red centre; plant covered with irritating hairs causing severe rash wherever in contact with skin. Shinyanga District: common in shade of *Ostryoderris* and *Albizzia* and other trees at Huru Huru, 1080 m., 17 May, 1931, *Burt* 2454: a yellow-flowered herb.

PORTUGUESE EAST AFRICA. Lupata, 20 April, 1860, *Kirk* s.n. (type).

NORTHERN RHODESIA. Livingstone District: Livingstone and common all along the railway, April 1909, *Rogers* 7007. Namwala District: in clearings in dense *Baikiaea* forest at Namwala, April 1934, *Trapnell* 1437: a herb 1.2 m. high. Mazabuka District: in *Commiphora*—*Combretum* scrub in Gwembe (Zambezi) Valley, 450 m., March 1934, *Trapnell* 1406: a herb 1.2 m. high with yellow flowers.

E.M.—R. *Monadenium succulentum* Schweickhardt, sp. nov. [Euphorbiaceae]; affinis *M. Guentheri* Pax sed foliis maioribus et phyllopodiis espinosis differt.

Planta succulenta, ramosa, perennis. *Rami* plus minusve 20 cm. longi et 1.5–2 cm. crassi, cylindrici, carnosii, glabri, virides, tessellati, in partibus vetustioribus fuscii et sublignosi, phyllopodiis inferioribus espinosis usque ad 2 cm. longis et 1 cm. latis, apicem ramorum versus 7 mm. longis et 1 cm. latis. *Folia* apice ramorum laxe rosulata, usque ad 4.5 cm. longa et 1 cm. lata, apice ramorum gradatim decrescentia, oblanceolata, carnosia, glabra, intense viridia, acuta, pagina superiore concava et nervis intermediis prominentibus, pagina inferiore convexa et obtuse carinata. *Stipulae* minutissimae, rudimentariae. *Cyma* circiter 9 mm. longa et 1.5 cm. lata, axillaris, 3–7 cyathia gerens; pedunculus 3–6 mm. longus, crassus; rami cymae pedunculo multo breviores; prophyllum cyathii obliquum, 5–6 mm. longum et 9 mm. latum, apice valde bifidum, bicarinatum, apertum, glabrum, glaucum, viride, margine pallide purpureum. *Cyathium* prophyllum aequans vel excedens, 6–7 mm. longum, cupuliforme, latere anteriore usque dimidium aperto, lobos interiores subquadratos fimbriato-denticulatos superans, glabrum, extra viride, margine paullo incrassato crenato et rubro-pullo. *Ovarium* exsertum et reflexum, papillatum, viride, maculis purpureis irregulariter suffusum, 4 mm. longum et 3 mm. latum, 3-angulatum; anguli alii binis obscuris papillatis obsiti; perianthium basi ovarii 3-lobatum; lobi perianthii deltoidei. *Styli* triente inferiore connati, apice bilobati; stigma obtusum et paullo incrassatum. *Capsula* et semina ignota.

KENYA COLONY. Laikipia, Ngobit River, *H. M. Gardner* 1478 in *Herb. Kew.*, "a succulent plant growing in close cushions in dry hot rocky areas." Without exact locality, comm. *A. W. Hill* and flowered in *Hort. Bot. Reg. Kew* (type).

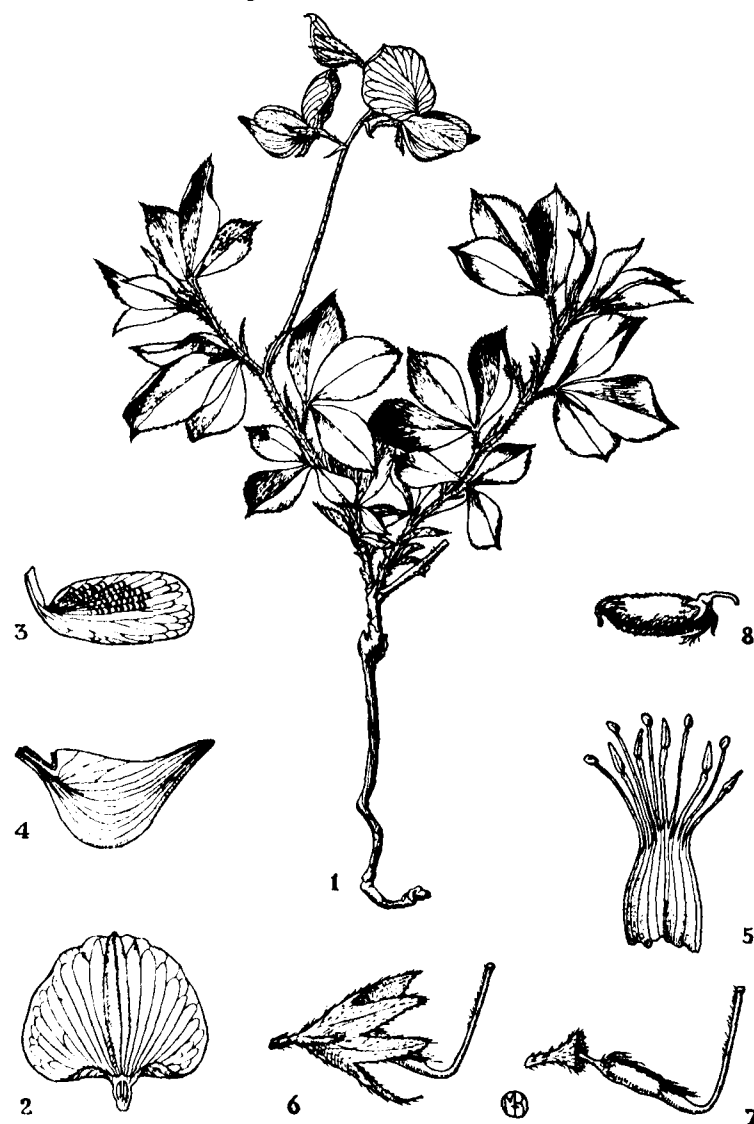
***Crotalaria (Eucrotalaria) lotiformis* Milne-Redhead, sp. nov.** [Papilionaceae]; a *C. molli* E. Mey. foliis acutis supra villosis, pilis pedunculi et calycis subadpressis, stipulis falcatis persistentibus, carina vix rostrata facile distinguenda.

Herba perennis, rhizomate gracili repente. *Caules* pauci, haud caespitosi, erecti vel decumbentes, leviter ramosi, villosi, 5–15 cm. longi, demum longiores, foliosi, internodiis inferne circiter 3 mm. superne usque 2.5 cm. longis. *Folia* petiolata, trifoliolata, stipulata, stipulis leviter falcatis erectis usque 1 cm. longis basi circiter 1 mm. latis supra glabris subter parce villosis persistentibus; petioli adscendentes, usque 7 mm. longi, 1 mm. diametro, supra leviter sulcati, villosi; foliola sessilia, oblanceolata, apice acuta, recurvata, basi attenuata, usque 3.5 cm. longa et 1 cm. lata, utrinque longe et adpresse villosa, praesertim pagina inferiore; nervi supra inconspicui, subter prominentes, dense villosi. *Inflorescentiae* terminales, racemosae, 1–5-florae; pedunculi 1–5 cm. longi, leviter et adpresse villosi; bractae lineari-subulatae, usque 3 mm. longae, supra glabrae, subter adpresse villosae; pedicelli adscendentes, 3–7 mm. longi, breviter et adpresse villosi. *Calyx* 5-dentatus, extra villosus, intus glaber; tubus circiter 2 mm. longus; dentes lanceolati, acuti, 4.5 mm. longi, basi circiter 2 mm. lati. *Vexillum* suborbiculare, circiter 1.2 cm. diametro, apice minute apiculatum, basi unguiculatum, ungue 2 mm. longo reflexo, callis basalibus vix 1 mm. longis acutis instructum, luteum, purpureo-lineatum; alae obovato-oblongae, circiter 1.1 cm. longae, superne 4.5 mm. latae, basi unguiculatae, ungue 2 mm. longo obliquo, luteae; carina dorso rotundata, apice acuta vix rostrata, inferne leviter auriculata, basi unguiculata, ungue 2 mm. longo, circiter 1.1 cm. longa, medium versus 5 mm. lata, lutea, purpureo-lineata. *Stamina* breviora antheris 2.6 mm. longis, longiora antheris circiter 1 mm. longis praedita. *Ovarium* oblongum, compressum, breviter stipitatum, circiter 5 mm. longum, sutura et apice barbatum, lateribus glabrum, multi-ovulatum. *Legumen* immaturum oblongo-cylindricum, sessile, circiter 1.5 cm. longum et 5 mm. diametro, velutinum.

KENYA COLONY. Masai Province. On hillsides in thorn-bush country at Ngong, 1800–2100 m., May 1934, *Napier* 3241 (Coryndon Museum no. 6304) (type):—a dwarf erect herb, about 1 dm. high; leaves with silvery tomentum; flowers yellow and red-brown or plain yellow, most flowers showing darker striations. On dry rocky ground at Kedong escarpment about 19 Km. south of Ngong hills, overlooking Lake Magadi in the distance, 2100 m., without date, *Napier* 1497:—base woody, leaves covered with silvery tomentum; flowers yellow striated at the base with maroon; keel shaded with maroon. In *Themeda triandra* grassland on black cotton soil at Ngong, 1800 m., 25 November 1930, *Edwards* 1490.

This very distinct species appears to have no close relative in Tropical Africa. In certain respects it approaches *Crotalaria mollis* E. Mey. from South Africa, but it is hard to say whether these species have any real affinity, as the present classification

of the African species is rather artificial. The flowers of *C. lotiformis* are similar in shape to those of *C. intermedia* Kotschy, but are smaller. The inflorescences are leaf-opposed, as the shoot from the axil of the uppermost leaf has often grown out to exceed the inflorescence by the time of flowering.



Crotalaria lotiformis Milne-Redhead. 1, plant in flower, nat. size; 2, vexillum, with claw bent forwards, from within, $\times 2$; 3, ala, from without, $\times 2$; 4, carina, $\times 2$; 5, androecium opened out, posterior view, $\times 2$; 6, calyx and gynoecium, $\times 2$; 7, gynoecium, $\times 2$; 8, legume, slightly immature, nat. size.

Running underground, *C. lotiformis* produces numerous leafy and flowering shoots varying in height from 3 cm. upwards, even the smallest bearing at least one flower. In the dried state the species is reminiscent of a *Lotus*.

Eriosema (Eueriosema) flexuosum Staner, sp. nov. [Papilionaceae]; ab affini *E. cordifolio* Hochst. ex A. Rich. foliis superne glabris, pedunculo valde majore, floribus majoribus vexillo glanduloso pubescenteque sat distincta.

Suffrutex e radice napiforme ortus, sarmentosus, ramosus, pilis fulvis patentibusque dense obtectus. *Folia* unifoliolata, subsessilia, petiolo 1–2 mm. longo et pilis fulvis oblecto; lamina ovata, basin versus valde cordata, lobis amplexicaulibus, apice acuta, 3–6 cm. longa et 2–4 cm. lata, supra glaberrima, subtus in nervis pubescens et inter nervos glandulosa, nervis lateralibus 7–8 utrinsecus mediani; *stipulae* lanceolatae, apice subulatae, 5–6 mm. longae et 2 mm. latae, striatae, extra pilis fulvis oblectae, intus glabrae. *Inflorescentiae* racemosae, axillares vel terminales, pedunculatae, pedunculis flexuosis, 5–10 cm. longis, pilis fulvis patentibusque dense ornatae, racemis laxis plurifloris 2–3 cm. longis; bractae subulatae, 4 mm. longae et 0.5 mm. latae, pubescentes. *Flores* subsessiles, 6–7 mm. longi, deflexi; calyx in toto circiter 6 mm. longus, extra pilis fulvis glandulisque ornatis, intus glaber, dentibus inaequalibus subulatis, quarum superior 2.5 mm. longa, lateralibus circiter 4 mm. longis et inferioribus circiter 5 mm. longis; vexillum obovatum, apice rotundatum, circiter 6.5 mm. longum et 3 mm. latum, biauriculatum, biappendiculatum, 1 mm. longe unguiculatum, extra pubescens et glandulosum; alae oblongae, 5–6 mm. longae, glabrescentes; carina naviculariformis, circiter 6 mm. longa, extra densissime glandulosa. *Legumen* oblongo-ovatum, statu immaturo 1 cm. longum, pilis fulvis longis patentibusque dense oblectum.

TANGANYIKA TERRITORY. Rungwe District, Bundali, 1400 m. 3 March 1914, A. Stolz 2571 (type).

The following synonymy, published at the request of Dr. Staner, is necessary on account of *Eriosema Richardi* var. *ovata* Staner et De Craene proving to be the same as *E. Buchanani* Bak. f.

Eriosema Buchanani Bak. f. in Journ. Bot. 33, 145 (1895); Leg. Trop. Afr., 505 (1929). *E. Richardi* Benth. ex Bak. f. var. *ovata* Staner et De Craene in Rev. Zool. Bot. Afr. 24, 286 (1934).

Eriosema Buchanani Bak. f. var. **Richardi** (Benth. ex Bak. f.) Staner, comb. nov. *E. Richardi* Benth. ex Bak. f. Leg. Trop. Afr., 505 (1929); Staner et De Craene in Rev. Zool. Bot. Afr. 24, 284 (1934). *E. polystachyum* Bak. in Oliv. Fl. Trop. Afr. 2, 225 (1871) p.p.; Engl. Hochgebirgsfl. Trop. Afr. 272 (1892), p.p. non E. Mey.

Eriosema Buchanani Bak. f. var. **Richardi** (Benth. ex Bak. f.) Staner forma **elliptica** (Staner et De Craene) Staner, comb. nov. *E. Richardi* Benth. ex Bak. f. forma *elliptica* Staner et De Craene in Rev. Zool. Bot. Afr. **24**, 286 (1934).

Loranthus tetraparitus E. A. Bruce, sp. nov. [Loranthaceae]; affinis *L. messinensi* N. E. Br. (§ Acrostachys) sed floribus longioribus gracilibus, foliis latioribus minus carnosus differt.

Caules teretes, 6 mm. diametro, glabri, internodiis 1-3 cm. longis griseo-cinereis. *Folia* petiolata, petiolo 1-2 cm. longo supra canaliculato; lamina ovato-lanceolata vel late elliptica, leviter carnosus, 3.5-4.5 cm. longa, 2-4 cm. lata, glabra, apice obtusa basi cuneata, nervis lateralibus utrinque circiter 4 ascendentibus. *Racemi* 12-15 cm. longi, basi 2 mm. lati, glabri, 40-50-flori. *Pedicelli* 2-4 mm. longi, glabri, crassi, e basi leviter dilatati, apice unibracteolati, bracteola ovata concava apice obtusa vel truncata 1.5 mm. longa. *Calyx* (receptaculo incluso) cupuliformis vel campanulatus, 2-3 mm. longus, truncatus vel undulatus. *Corolla* polypetala, flava, alabastro subacuta, 2.1 cm. longa, basi 2 mm. lata, 4 mm. supra basin leviter contracta, apice 0.7 mm. lata; petala 4, linearia, 3 mm. supra basin reflexa, parte reflexa 2 cm. longa, intus margine leviter puberula, infra stamina plicata. *Stamina* erecta, supra partem plicatam corollae inserta, filamentis rubris 8 mm. longis, antheris linearibus 8 mm. longis nec transversiseptatis. *Stylus* gracilis, 1.5 cm. longus, glaber, stigmate capitato.

TANGANYIKA TERRITORY. Dodoma District, near Dodoma-Iringa Road, 3200-3400 ft., parasitic on unidentified species (possibly *Vangueria*), in dry thickets, G. W. St. Clair Thompson 369 (type).

Clausenopsis Hildebrandtii (Engl.) Milne-Redhead, comb. nov. et descr. ampl. [Rutaceae]. *Clausena*? *Hildebrandtii* Engl. Pflanzenw. Ost-Afr. C. **229** (1895). *C. Hildebrandtii* Engl. in Engl. Pflanzenw. Afr. **3**, i, 758 (1915) in Engl. Pflanzenfam, ed. 2, **19A**, 322 (1931).

Frutex vel arbor parvus, dioicus, deciduus. *Inflorescentiae* axillares, usque 2.5 cm. longae, parviflorae; pedunculi, pedicelli et calyces dense vel densissime breviter pubescentes; bracteae minutae, pubescentes; pedicelli usque 4 mm. longi. *Flores* ♂:—*Sepala* 4, ovata, obtusius circiter 1 mm. longa, inaequalia. *Petala* 4, oblonga, obtusa, basi vix angustata, 5.5 mm. longa. *Stamina* 8, inaequalia, usque 5 mm. longa; filamenta libera, leviter compressa, superne angustata, glabra. *Ovarium* sterile, ellipsoideum, apice minute capitatum, circiter 1 mm. longum. *Flores* ♀:—*Sepala* iis florum masculorum similia. *Petala* 4 vel 5, inaequalia, ovata, obtusa, usque 4 mm. longa, 25 mm. lata, glabra. *Staminodia* 0. *Ovarium* pyriforme, circiter 2 mm. longum, vix 2 mm. diametro, glabrum, glanduloso-punctatum; stylus brevissimus, robustus; stigma capitatum.

KENYA COLONY. Ukamba Province: near Kitui, June 1877, *Hildebrandt* 2814 (type in Herb. Berol.):—a tree or shrub with leaves and fruit smelling like juniper. Masai Province: on dry rocky slope covered with herbaceous plants on Capt. Cowie's farm near M'Bagathi, 1750 m., 6 Nov., 1932, *Gilbert Rogers* 30:—an erect stunted branched shrub, about 2 m. high; flowers appear with the new leaves, aromatic; ovary gland-dotted; ♀ flowers only: in open dry secondary scrub forest on Capt. Cowie's farm near M'Bagathi, 1750 m., 16 Nov., 1932, *Gilbert Rogers* 42:—staminate flowers of no. 30: in open dry stunted secondary forest at Bahati., M'Bagathi District, 1750 m., 12 Feb., 1933, *Gilbert Rogers* 410:—leaves and fruit of a deciduous dioecious shrub, 2.5 m. high: flowers collected previously.

In September 1896, Engler published a description of *Vepris*? *angolensis*, and formed a new section, *Clausenopsis* Engl., to which his new species was referred. The type specimen is *Welwitsch* 1315 in Coimbra Herbarium.

A few months later in the same year Hiern described *Clausena melioides* from a duplicate of the same *Welwitsch* number in the British Museum Herbarium. The identity of these two plants does not appear to have been realised until 1931, when Engler's account of the *Rutaceae* in the second edition of the 'Pflanzenfamilien' was published. Engler here raises *Clausenopsis* to generic rank, placing it in the *Toddalieceae*, and reduces *Clausena melioides* Hiern to a synonym of *Clausenopsis angolensis* (Engl.) Engl.

Clausena? *Hildebrandtii* Engl. a species from Kenya Colony, whose fruits are practically indistinguishable from those of *Clausenopsis angolensis*, was, strange to say, retained by Engler in *Clausena* as an anomalous species. *C. Hildebrandtii* is now transferred to *Clausenopsis*, and a description of its flowers is also published, made possible by the very complete material recently received at Kew from Mr. C. Gilbert Rogers.

Raphionacme caerulea E. A. Bruce, sp. nov. [Asclepiadaceae]; affinis *R. lineari* K. Schum. sed lobis corollae latioribus acutis, lobis corollae bifidis valde distinctis.

Herba perennis, lignosa, pubescens, 0.6-1 m., alta, tubero crasso. *Caules* simplices, erecti, pubescentes. *Folia* subsessilia, leviter pubescentia, linearia, basi obtusa, apice acuta, 9-10 cm. longa, circiter 5 mm. lata, margine incurvo ciliato, costa media supra impressa infra prominente. *Inflorescentia* laxa, elongata, 5-10-cymulosa, cymulis 2-3-floris sessilibus 2-5 cm. distantibus; pedicelli 1-2 cm. longi, pilosi, bracteis parvis lineari-lanceolatis mox deciduis. *Calyx* fere ad basin 5-lobatus, lobis lanceolatis 5 mm. longis 1.5 mm. latis acutis extra pilosis intra glabris, margine ciliato. *Corolla* caerulea, 5-lobata; tubus late campanulatus, 4 mm. longus et latus, leviter pilosus; lobi oblongo-lanceolati, acuti vel subacuti, 1.9 cm. longi, 7 mm. lati, extra leviter pilosi, intus glabri. *Coronae-lobi* e fauce corollae tubi orti, erecti, glabri, lateraliter compressi,

ventraliter explanati, trapezoidei, 1 cm. longi, infra apicem 0.5 cm. lati, basin versus constricti, apice bifidi vel bicornuti, cornubus 2 mm. longis, angulis lateralibus breviter cornutis. *Antherae* 4 mm. longae, anguste triangulares, conniventes.

SIERRA LEONE. Near Bumban, 300 m., on bare granite, a woody, blue-flowered herb, 0.6–0.9 m. high, with a thick fleshy tuber, growing in a mat of *Eriospora* roots, Deighton 1246 (type).

Pluchea monocephala E. A. Bruce, sp. nov. [Compositae]; affinis *P. nitense* O. Hoffm. sed foliis lineari-lanceolatis, bracteis involucri pubescentibus differt.

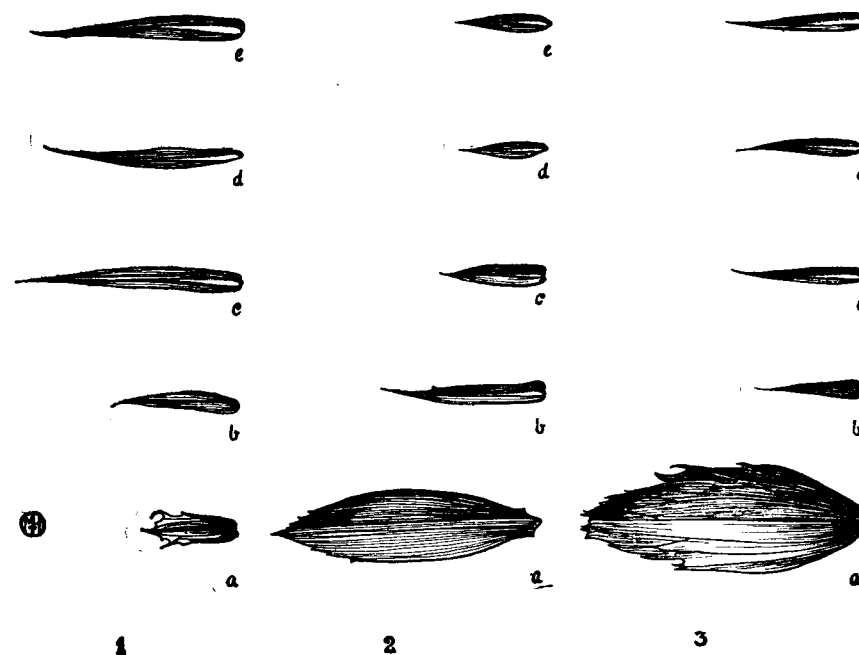
Herba perennis, erecta vel suberecta, ramosa, caule inferne lignescente, ramis alternis erecto-patentibus striatis 1–2 cm. distantibus leviter villosis demum glabrescentibus. *Folia* alterna, sessilia vel subsessilia, lineari-lanceolata, 0.7–3 cm. longa, 0.2–1 cm. lata, apice acuta vel subacuta, basi cuneata, margine integra, utrinque villosa, demum glabrescentia. *Capitula* solitaria, late campanulata, 0.7–1 cm. longa, 0.8–1.5 cm. lata, longe pedunculata. *Pedunculi* ramos laterales terminati, 2–6 cm. longi, bracteati, bracteis 2 mm. longis lineari-lanceolatis. *Bractee* involucri circiter 5-seriatae, imbricatae, ab exterioribus brevibus ovato-lanceolatis circiter 1.5 mm. longis ad intimas elongatas usque 8 mm. longas lineari-lanceolatas, omnes leviter ad apicem dense pubescentes, acuminatae, stramineae, nervo medio brunneo ad apicem latiore. *Receptaculum* alveolatum, breviter setulosum. *Flores* radii ♀, pauci; corolla filiformis, glabra, 4 mm. longa, apice minute dentata, stylo 2 mm. exserto apice profunde bilobo, lobis gracilibus 2 mm. longis. *Achaenia* immatura 1.5 mm. longa, oblongo-cylindracea, dense adpresso-sericeo-pubescentia, pappo setis pluribus brevibus persistentibus et setis longioribus 2–4 mox deciduis circiter 2 mm. longis coronata. *Flores* disci ♂ numerosi; corolla purpurea, tubulosa, apice sensim et leviter expansa, circiter 6 mm. longa, apice 1 mm. basi 0.5 mm. lata, glabra, breviter 5-lobata, lobis acutis setis paucis ornatis e sinibus ad basin corollae nervis 5 brunneis notata; antherae apice appendiculatae, basi breviter caudatae, caudis cohaerentibus; stylus 0.5 mm. exsertus, breviter bilobus, lobis clavatis obtusis. *Achaenia* matura 2 mm. longa, cetera foeminea simulantia.

TANGANYIKA TERRITORY. Ngorongoro Crater, about 1800 m., in saline soils near Magadi Lake on flat game-plains. B. D. Burtt 4331 (type); Ngorongoro, 1800 m. a very common weed associated very largely with *Cynodon plectostachyus* on the lower slopes of the crater, R. R. Staples 288.

Crossandra thomensis Milne-Redhead, sp. nov. [Acanthaceae]; habitu et foliis iis *C. guineensis* Nees similis, sed calyce longiore et bracteis calyce multo brevioribus differt.

Herba perennis, usque 25 cm. alta; caules inferne procumbentes, radicanes, superne erecti vel adscendentes, foliosi,

densissime et crispule hirsuti, internodiis 1–6 cm. longis. *Folia* petiolata, obovata vel oblongo-obovata, apice brevissime et obtusissime acuminata, basi cordata vel subauriculata; laminae usque 8.5 cm. longae, discolores, supra pilis sparsissime adspersae, subtus nervis densiuscule crispule hirsutis; petioli usque 1.2 cm. longi, densissime et crispule hirsuti. *Inflorescentiae* terminales, circiter 10-florae; rhachis puberulus; bractee oblongae, leviter concavae, sessiles, margine superne spinulis brevibus instructae, usque 6 mm. longae et 2.5 mm. latae, papyraceae, puberulae; bracteolae lanceolatae, leviter concavae, apice mucronatae, circiter 9 mm. longae, papyraceae, puberulae. *Calycis segmenta* 5, libera subaequalia, anguste lanceolata, apice mucronata, margine superne minutissime dentata vel integra, posticum et antica circiter 14 mm. longa et 2 mm. lata, lateralia circiter 13 mm. longa et 1.5 mm. lata, omnia papyracea, puberula. *Corollae tubus* anguste cylindricus, circiter 2.5 cm. longus, medium versus 1.5 mm., basi 2.5 mm. diametro; limbus circiter 2.5 cm. diametro. *Stamina* tubo affixa; filamenta circiter 2.5 mm. longa, superne leviter hirsuta; antherae dithecae, 2.5 mm. longae, superne leviter hirsutae. *Discus* minutus. *Ovarium* ob-



1, *Crossandra thomensis* Milne-Redhead; 2, *C. guineensis* Nees; 3, *C. Tallotii* S. Moore. a, bract; b, bracteole; c, posterior calyx segment; d, lateral calyx segment; e, anterior calyx segment; all $\times 2$.

longum, circiter 2.5 mm. longum, glabrum; stylus filiformis, circiter 2 mm. longus, glaber. *Capsula* circiter 1.5 cm. longa, 4-sperma; semina glabra, dense tuberculata, circiter 2.5 mm. diametro.

SÃO TOMÉ. Rio Salgado, Angolares, 50 m., Jan. 1886, *Quintas* 1089 (type in Herb. Coimbra):—herb; flowers bright violet.

At first sight *C. thomensis* might be mistaken for the common West African species, *C. guineensis* Nees, so similar is the general appearance of the plants. The bracts, so conspicuous a feature in *C. guineensis* and in *C. Talboti* S. Moore, another closely allied species, are in *C. thomensis* relatively inconspicuous, being considerably shorter than the calyx segments. The relative sizes and shapes of the bracts, bracteoles and calyx segments of these three species are shown in the accompanying figure.

***Disperma eremophilum* Milne-Redhead, sp. nov.** [Acanthaceae]; a *D. trachyphyllum* Bullock foliis obtusis pilis albis stellatis indutis, bracteis et calyce longe albo-villosis, inflorescentiis 1-3-floris differt.

Frutex parvus, erectus, deciduus. *Rami* adscendentes, recti, rigidi, quadrangulares, internodiis usque 8 cm. longis; cortex minute et crispule albo-pubescent, demum glaber, deciduus, secundum angulos longitudinaliter fissus. *Folia* subsessilia, obovata, apice rotundata, truncata vel leviter emarginata, basi cuneata, crenulato-dentata, usque 3 cm. longa et 1.5 cm. lata, utrinque pilis albis stellatis radio centrali elongato densiuscule induta, inferne pilis longis albis simplicibus ciliata; petioli usque 2 mm. longi, basi ramos amplexantes. *Inflorescentiae* 1-3-florae, axillares, subsessiles; bracteae sub anthesi obtriangulares, apice obscure tridentatae, circiter 1 cm. longae, superne 6 mm. latae, basi 2 mm. latae, superne pilis albis stellatis indutae, inferne extra et margine pilis longis simplicibus albis instructae, intus glabrae; bracteolae oblongo-spathulatae, vix 1 cm. longae, indumento ei bractearum simili. *Calyx* sub anthesi inferne ecyndricus; segmenta duo antica fere usque ad apicem connata, 8 mm. longa; segmenta tria postica 7 mm. longa, superne 2 mm. libera, acuta; calyx extra pilis longis albis simplicibus dense indutus, intus glaber. *Corolla* circiter 1.4 cm. longa, obscure bilabiata, glabra; tubus inferne cylindricus, superne leviter ampliatus, fauce valde venoso-palatifera, circiter 1 cm. longus; segmenta apice breviter bilobata. *Stamina* 4, glabra; antica filamentis circiter 4 mm. longis, postica filamentis 2 mm. longis instructa; antherae aequales, 1.5 mm. longae, muticae. *Discus* cupularis, 0.5 mm. altus. *Ovarium* oblongum, 1.5 mm. longum, 2-ovulatum, glabrum; stylus filiformis, circiter 1.3 cm. longus, glaber, apice breviter bilobus, lobis filiformibus inaequalibus. *Capsula* calyce et bracteolis accrescentibus inclusa, 6 mm. longa, glabra, disperma.

KENYA COLONY. Turkana Province: S. Turkana, without locality, 900 m., June 1932, *Buxton* 1026 (type);—a small shrubby plant abundant everywhere in dense clumps. Northern Frontier Province: very plentiful in places in the Kaisut "Desert" and on

Isiolo-Laisamis road, 600 m., 17 Dec., 1932, *Edwards* 1911-57:—a well shaped shrub about 45 cm. high in open on red very sandy soil. By the Tana River between Sankuri and Saka, 180 m., 14 April, 1934, *Sampson* 74:—common desert shrub in "grey bush"; this specimen was in leaf as it was growing in a hollow where water had settled—elsewhere not in growth.

In the key to the genus *Disperma* C. B. Cl. in the Flora of Tropical Africa, Clarke describes the calyces of *D. crenatum* (Lindau) Milne-Redhead (*D. quadrisepalum* C. B. Cl.) and *D. parviflorum* (Lindau) C. B. Cl. as having their three posticous segments free. If the calyces are carefully examined at the time of flowering, it will be seen that the segments are united for at least two-thirds of their length, forming a very definite tube. At a later stage the developing capsule splits the calyx along the lines of fusion of the three posticous segments, whilst the two anticous segments remain fused, resulting in the condition which Clarke describes. The same applies to *D. trachyphyllum* Bullock, although in this case the segments are extremely easily separated on dissection at the flowering stage. In *D. kilimandscharicum* (Lindau) C. B. Cl., the calyx of which Clarke describes as being subequally 5-fid, the ultimate separation of the segments does not take place at all or else a short split occurs which does not reach the base.

Disperma eremophilum is closely related to the four species mentioned above, from all of which it differs in having stellate indumentum and few flowered inflorescences. The segments of its calyx, which are at first fused, are ultimately free.

***Rhinacanthus pulcher* Milne-Redhead, sp. nov.** [Acanthaceae]; a *R. nasuto* (L.) Kuntze floribus maximis, antherarum thecis longe discretis haud contiguis, capsulis majoribus facile distinguendus.

Frutex laxo ramosus, circiter 1 m. altus, plus minusve deciduus. *Ramuli* primo minute tomentosi et subtiliter striati, demum cortice plus minusve suberoso obtecti. *Folia* anguste ovata, apice vix acuta, basi in petiolum circiter 5 mm. longum contracta, circiter 4 cm. longa et 1.7 cm. lata, utrinque minute scabrida praesertim costa et nervis lateralibus. *Panicula* ampla, ramis minute tomentosis et valde glandulosus; flores ad apices ramorum conferti; bracteae et bracteolae lanceolatae, calyce breviores, glandulosae. *Calyx* alte 5-fidus, circiter 7 mm. longus, extra glandulosus, intus glaber; segmenta anguste linearia, acuta. *Corolla* lactea, circiter 4.5 cm. longa; tubus tenuiter cylindricus, ad faucem vix ampliatus, circiter 2 cm. longus et 2 mm. diametro, extra basi excepta pubescens, intus glaber; limbus 2-labiatus, extra parvisse pubescens, intus minute et parce glandulosus; labium posticum lineari-lanceolatum, apice minute bifidum, 2.5 cm. longum, 3.5 mm. latum, leviter convexum; labium anticum latum, plano-patens, 2.5 cm. longum, 2.2 cm. latum, 3-lobatum, lobis ovatis obtusis aequalibus 14 mm. longis 8 mm. latis. *Stamina* 2, ad faucem affixa, corollae labiis breviora, circiter 1.4 cm. longa; antherae dithecae, thecis inter

se 3 mm. distantibus late ellipsoideis 1.5 mm. longis. *Discus* minutus, cupularis. *Ovarium* oblongum, circiter 2 mm. longum, glabrum; stylus circiter 3.4 cm. longus, inferne parce pilosus, superne glaber, apice minute bifidus. *Capsula* circiter 2.5 cm. longa, extra pubescens. *Semina* 4, matura non visa, immatura rugosa.

KENYA COLONY. Northern Frontier Province: Tana River, in desert between Hamagi and Dakacha, 250 m., March 1934, *Sampson* 4.

This very striking species appears to be most closely allied to the variable and widely spread *Rhinacanthus nasutus* (L.) Kuntze, although in the size of its flowers it approaches the Asiatic *R. calcarata* (Wall.) Nees, a species from which it differs considerably in leaf and inflorescence. *R. pulcher* appears to be unique in the genus in having its anther-thecae completely separate, the points of attachment to the filaments being about 3 mm. apart. Leaf development was very poor on the specimens collected, and in consequence the dimensions given in the description may be expected to be exceeded when material is collected at a more favourable season.

***Staurogyne capitata* E. A. Bruce**, sp. nov. [Acanthaceae]; ab omnibus speciebus africanis inflorescentia capitata differt.

Herba decumbens, ramosa; caules compressi, leviter striati, dense strigosulo-pubescentes, decumbentes, radicibus adventitiis numerosis instructi, internodiis elongatis. *Folia* petiolata, petiolo usque ad 2 cm. longo dense strigosulo-pubescente; lamina ovata vel elliptica, 2-6 cm. longa, 1.5-4 cm. lata, basi latissime cuneata, apice obtusa, nervis lateralibus utrinsecus 4 vel 5 dense strigosulo-pubescentibus. *Inflorescentia* terminalis, 2-5-flora, capitata. *Bracteae* oblongae, circiter 9 mm. longae, 2.5 mm. latae, apice rotundatae, basi cuneatae, bracteolis 2 minoribus lineari-oblongis circiter 7 mm. longis 1.5 mm. latis strigosulo-pubescentibus. *Calyx* 5-lobatus, tubo campanulato circiter 3.5 mm. longo, lobis abaxialibus 2 lineari-lanceolatis acutis 3 mm. longis, lateralibus 2 minoribus 1 mm. longis acutis, adaxiale 1 majore late lanceolato 4.5 mm. longo basi 3 mm. lato apice subacuto, omnibus strigosulo-pubescentibus. *Corolla* alba, glabra, 1.3 cm. longa, tubuloso-cylindrica, basin versus constricta, tubo circiter 1 cm. longo fauce 4 mm. basi 1.5 mm. lato, lobis imbricatis orbiculari-ovatis circiter 3 mm. longis 2 mm. latis apice rotundatis. *Stamina* 4, didynama, basi tubi corollae inserta; filamenta circiter 7 mm. longa, compressa, apicem versus valde pubescentia; antherae 2-loculares, loculis divaricatis ellipsoideis circiter 0.5 mm. longis. *Ovarium* late ovoideum, circiter 1.5 mm. longum, stylo simplice circiter 8 mm. longo, stigmatate 3-lobato, lobo medio ovato, 2 lateralibus minoribus linearibus. *Capsula* late ovoidea, 3 mm. longa, 2.5 mm. lata, pallide fusca; semina compressa, ellipsoidea, numerosa, in loculis circiter 10.

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LIBERIA. Fayapulu, on wet rocks, a trailing plant with white flowers, *J. Bequaert* 1141 (type); no locality *O. F. Cook* 139.

GOLD COAST. Axim District; Asamang, herb with white flowers, in moist humid parts of rain forest, *T. F. Chipp* 154.

Only three species of this genus have hitherto been recorded from Tropical Africa:—*S. kamerunensis* (Engl.) Benoist, from the Cameroons and Southern Nigeria, *S. Le-Testuana* Benoist, from Komba and Maiombe, French Congo, and *S. congoensis* S. Moore, also from Maiombe. These species differ from *S. capitata* in their long spicate inflorescence.

***Coleus equisetiformis* E. A. Bruce**, sp. nov. [Labiatae]; ab omnibus speciebus africanis pedicellis longioribus rigidis disarticulatis, calycis lobis linearibus fere subaequalibus differt.

Herba perennis, erecta, 1 m. alta, internodiis 2-5 cm. longis infimis tomentosis superioribus glandulosis pilis brevibus patentibus instructis. *Folia* aromatica, opposita, breviter petiolata vel subsessilia, petiolo brevi usque ad 8 mm. longo tomentoso; lamina ovato-lanceolata, 4.5-7.5 cm. longa, basi 2-2.5 cm. lata, apice sensim acuminata, basi truncata vel subcordata, margine crenato-serrata, subtus tomentosa, nervis reticulatis valde distinctis, supra glabra vel minute puberula. *Inflorescentia* composita, 20-30 cm. longa, inferne ramosa, verticellis 6-floris, internodiis circiter 3 cm. longis. *Bracteae* ovato-lanceolatae, 0.5-1 cm. longae, pubescentes; pedicelli rigidi, ascendentes, 1.5-3 cm. longi, apice disarticulati. *Calyx* statu florifero campanulatus, 4 mm. longus, extra glandulosus et strigosulo-pubescentis, intus glabrescens; tubus brevis, 1.5 mm. longus; dentes 5, lineares, circiter 2.5 mm. longi, acuminati, 2 infimis paullo longioribus; statu maturo accrescens, usque ad 1 cm. attingens. *Corolla* lilacina, bilabiata, 12-15 mm. longa, extra pubescens; tubus circiter 6 mm. longus, basi ventriculosus, 1.5 mm. longus, supra geniculatus, demum ampliatus; labrum superior trilobatum, 5 mm. longum, lobo mediano emarginato; inferior ovato-ellipticum, circiter 1 cm. longum, 5 mm. latum, integrum, longitudinaliter plicatum. *Stamina* inclusa, basi connata et ad corollam adhaerentia, superne 8 mm. libera, antheris medifixis 0.5 mm. longis. *Stylus* staminibus subaequilongus, apice bifidus. *Nuculae* ellipsoideae, 2 mm. longae, 1 mm. latae.

TANGANYIKA TERRITORY. Mpwapwa, Kibariani Mts., 1650 m. in upper *Protea-Brachystegia* savannah on rubble soil with shallow humus in the shade of trees, *B. D. Burtt* 3892 (type); Mpwapwa North, 1500-1800 m., in good soil on mountain, *Mr. & Mrs. Hornby* 442.

C. equisetiformis appears to be a link between *Coleus* and *Holostylon*. The general appearance, the form of the calyx and the long, stiff pedicels resemble *Holostylon*. It differs from this genus in the inflorescence, the verticels being simple and not pedunculate monochasials, and also the style, which is bifid and not entire. It resembles *Coleus* in the inflorescence, the form of the corolla and the united filaments.

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XXV—NOTES ON THE GENUS ROYENA LINN.
B. L. BURTT.

The following paper contains an account of those tropical African species of *Royena* Linn. (*Ebenaceae*) which are related to *R. macrocalyx* Gürke. These species form a natural group distinguished by their small cymose inflorescences and a tendency to have larger leaves than is usual in the genus and to develop an arborescent habit. In these respects they approach the genus *Diospyros* Linn., from which they differ chiefly in having hermaphrodite flowers. In the present state of our knowledge the differences between the two genera are not absolutely clear-cut and my chief reason for placing these species in *Royena* (following Gürke) rather than *Diospyros* (following Hiern) is that I can find no close affinity for them in the latter genus, whereas they are evidently related to the other species of *Royena* through the South African *R. villosa* Linn. (see p. 288).

The geographical distribution of the five species of this group is interesting and confirms the specific rank given to them on morphological grounds. *R. heterotricha* is the only species which occurs on the west of the continent and it is confined to Angola and the Congo. *R. macrocalyx*, as here understood, extends down the eastern side of the continent from Kenya to Portuguese East Africa but not more than about 100 miles from the coast. The two arborescent species occupy rather restricted areas, *R. zombensis* in Nyasaland and upper Portuguese East Africa, *R. amnicola* in the Mpwapwa district of Tanganyika Territory. The fifth species is also found in Tanganyika, but further west, chiefly around Singida and Tabora where it is a shrub of grasslands.

In the citation of specimens the letters B.M. stand for the British Museum herbarium, and O. for the herbarium of the Imperial Forestry Institute, Oxford. The numbers in the text refer to the bibliography at the end of the paper.

KEY TO THE SPECIES ENUMERATED.

- Bracts ovate, rounded at the base; fruiting calyx enlarged and enclosing the fruit. 1. *macrocalyx*.
- Bracts linear or linear-lanceolate, narrowed to the base; fruiting calyx enlarged, but the lobes more or less reflexed. Calyx long-pubescent or glandular outside. Leaves, at least when young, thinly pubescent on both surfaces. 2. *heterotricha*.
- Leaves glabrous or glandular above, pubescent on the nerves or glabrous below. 3. *zombensis*.
- Calyx densely villous outside. Petioles 5 mm. long; leaves obovate; usually a large riverine tree. 4. *amnicola*.
- Petioles short, 2 mm. long; leaves oblong-obovate; a small savannah shrub. 5. *Fischeri*.

ENUMERATION.

1. *Royena macrocalyx* Gürke in Engl. Pflanzenwelt Ost-Afrikas, C. 305 (1895); in Engl. Bot. Jahrb. 26, 62 (1898). *Diospyros macrocalyx* Klotzsch in Peters, Reise nach Mossamb. 182 (1862)—non A. DC. Prodr. 8, 226 (1844). *Diospyros Loureiriana* Hiern, Monogr. Ebenac. 194 (1873)—? non G. Don, Gen. Syst. 4, 39 (1838). *Diospyros Loureiriana* var. *macrocalyx* (Klotzsch) Hiern in Journ. of Bot. 13, 355 (1875); in Oliver, Fl. Trop. Afr. 3, 522 (1877).

In 1790 Loureiro (1) recorded a specimen of *Diospyros Lotus* Linn. from E. Africa, almost certainly from Mozambique where he was delayed for three months on his way back from China. His description of it was:—

"*Arbuscula* 6-pedalis: ramis patentibus. Folia ovato-lanceolara, integerrima magna, alterna, glabra, paginis discoloribus, costis obliquis prominentibus. Flos pallidus, terminalis, solitarius: calyce foliaceo maximo, 4-5-partito, plano, permanente. Bacca rotunda, semipollicaris, lutea, lanuginosa, 1-locularis, 8-sperma: seminibus compresso-oblongis, osseis: pulpa vix ulla."

G. Don (2) believed Loureiro's plant to be distinct from *Diospyros Lotus* Linn. and based a new species, *D. Loureiriana*, upon it; he incorrectly gave the locality as Cochinchina. A. De Candolle (3) corrected the locality to E. Africa but considered the species *non satis nota*.

The species rested upon Loureiro's description alone until Hiern's monograph of the family in 1873. He identified with it (4) several specimens collected by Sir John Kirk in Portuguese East Africa and others from the Congo and Angola collected by Burton and Welwitsch respectively. Hiern also described one of Welwitsch's specimens as variety *vernalis*. A manuscript note on the Kew copy of his monograph reads "The specimens from the Western side of the continent may perhaps belong to a different species (*D. heterotricha*) from those of the Eastern side, differing by a less amplified fruit calyx. W.P.H. 24/xii/74."

Hiern reduced *Diospyros macrocalyx* Klotzsch (5) to a synonym of *D. Loureiriana*. Gürke, however, has pointed out (6,7) that Loureiro's description of the plant he called *Diospyros Lotus* does not agree with Klotzsch's plant. It differs in the glabrous leaves, the solitary terminal flowers and the unilocular fruit.

I have examined the type specimen of *D. macrocalyx* Klotzsch and it is an excellent match of Kirk's specimens named *D. Loureiriana* by Hiern. Loureiro's specimen of the latter I have been unable to trace. It is not in the British Museum herbarium, nor is it mentioned by Gomes (8) in his lists of Loureiro's specimens at Paris and Lisbon, and I therefore conclude it is amongst those that have been lost. In the absence of a specimen and in view of the differences between Loureiro's description and the plants identified with it, it is proposed that the name *D. Loureiriana* should be discarded.

Gürke (6,7) transferred *D. macrocalyx* Klotzsch (= *D. Loureiriana* G. Don sensu Hiern) to *Royena*, but as the name *D. macrocalyx* Klotzsch is illegitimate, being a later homonym of *D. macrocalyx* A. DC., *Royena macrocalyx* must be regarded as a new name and be attributed to Gürke alone. I find there is a close affinity between *R. macrocalyx* and *R. villosa* Linn., a South African species found in forests from the George Division eastwards to Natal. Points of affinity include the size of the leaves, which are larger than is usual in the S. African species, the three-flowered peduncles and the hermaphrodite flowers, and are sufficient to justify the inclusion of *R. macrocalyx* in *Royena* rather than in *Diospyros*. Hiern placed *D. Loureiriana* in his section *Guaiacana* of *Diospyros* but I do not find that the other species, from Madagascar, Borneo and Malacca, are closely related.

Certain variations which are noticeable in the material of *R. macrocalyx* in the Kew herbarium may assume greater importance when our knowledge of the species increases, for they seem to be correlated with geographical distribution. The specimens from Kenya and Tanganyika are, on the whole, more hairy than those from Portuguese East Africa, the young leaves and branchlets especially being quite densely setose; the leaves also are inclined to be shorter and broader in the northern material. It may also be noted that according to Peters a red dye is obtained from the roots of the Mozambique plant whereas in Kenya and Tanganyika the dye is black. These differences are not absolutely constant, however, and the specimens from Kenya, Tanganyika and Portuguese East Africa should be regarded as conspecific.

KENYA COLONY. Mariakani, "a large shrub up to 12 ft. growing in grass and savannah lands: leaves very pubescent on both surfaces when young: old leaves glossy and dark green on upper surfaces: flowers white, sepals persistent and accrescent: a black dye is obtained from the roots," "mkuroponya" (Giriana), "mkongo" (Mkamba), "mdaa" (Swahili), 1929, *Graham* 1821.

TANGANYIKA TERRITORY. Usambara, Gombelo, July 1893, *Holst* 2126/A. N. Kilosa, Mamboya, c. 450 m., Jan. 1931, *Haarer* 1977. Kilosa subdistrict, Feb. 1921, *Swynnerton* 2008 (B.M.). Kilosa subdistrict, Dec. 1921, *Swynnerton* 2010 (B.M.). Morogoro district, "shrub 4 ft.: a black dye obtained from boiled roots, used for dyeing fibres for mats," c. 360 m., "mdala mweupe" (Kiswahili), Feb. 1932, *Wallace* 63. Morogoro district, near Mikase, "tree to 8 ft.: bark pounded and black colour dissolved out and used for dyeing cloth," 2,450 m. "mgoyo" (Kikame), "mdala" (Kiswahili), Feb. 1933 *Wallace* 679. Kissaki Steppe, 250 m., 1898, *Goetze*. Rufiji, "bush 15-20 ft. high, flowers green; very common on poor ground in sunny positions," c. 15 m., Dec. 1930, *Musk* 69. Lindi district, Quiloa (Kilwa), Jan. 1867, *Kirk* 109. Tendaguru, "wooded grassland," 180 m., Dec. 1930, *Migeod* 1037 (B.M.). Morogoro district, hills above the town, "lower alluvial slopes clothed with *Stereospermum*, *Combretum Zeyheri* and *Anona senegalensis*: cop-

piced shrub to small tree, 6-10 ft.; common and widely distributed," 600 m., Dec. 1933, *B. D. Burt* 4892.

NYASALAND. Shire Highlands, Dec. 1893, *Scott Elliot* 8678. Chiromo, Shire, Jan. 1894, *Scott Elliot*, 8812.

PORTUGUESE EAST AFRICA. Sena, Oct. 1858, *Kirk*. Opposite Sena, Jan. 1859, *Kirk*. Between Lupata and Tette, Feb. 1859, *Kirk*. Rovuma river, March 1861, *Kirk*. Chibabava, Lower Buzi, 120 m. "a large shrub with creamy flowers occurring throughout from Zinyumbo to Inyamita," Dec. 1906, *Swynnerton* 1189.

2. *Royena heterotricha* (Welw. ex Hiern) B. L. Burt, stat. nov., ob fructum minorem, calycis lobos reflexos, bracteis lineares virides et folia minora haud pro varietate *R. macrocalycis* Gürke habenda. *Diospyros Loureiriana* var. *vernalis* Hiern, Monogr. Ebenac. 195 (1873). *Diospyros Loureiriana* var. *heterotricha* Welw. ex Hiern in Journ. of Bot. 13, 355 (1875); in Oliver, Fl. Trop. Afr. 3, 522 (1877); in Cat. Welw. Afr. Pl. 1, pt. 3, 652 (1898); Greves in Journ. of Bot. 65, suppl. 2, 78 (1927).

BELGIAN CONGO. Without locality, Sept. 1863, *Burton*. Without locality, *Smith*. Boma, April 1906, *Pynaert* 7. Eala, Feb. 1919, *Corbisier* 145. Eala, May 1919, *Vermoesen* 2372. Temvo, Feb. 1919, *Vermoesen* 1589.

ANGOLA. Golungo Alto and Ambaca, 1855-56, *Welwitsch* 2535, 2535B. Malange, Oct. 1887, *Henriques* 17. Loanda, *Gossweiler* 431. Sumba, Peco, 50m., Dec. 1921, *Gossweiler* 8723.

As both Hiern and Gürke suspected there is no doubt that this is quite a distinct species from *R. macrocalyx*, for, in addition to the botanical characters mentioned in the diagnosis, it is completely isolated geographically.

3. *Royena zombensis* B. L. Burt, species nova *R. amnicolae* B. L. Burt affinis, speciei pariter arborescenti, sed calyce extra glanduloso nec villosa, foliis longius acuminatis, ramulis subglabris differt.

Arbor. *Ramuli* novelli basi perulati, tenuiter glandulis stipitatis vestiti, interdum setis mox caducis sparse instructi. *Perulae* infimae squamiformes, apicibus rotundatae, sensim in foliis transeuntes. *Folia* alterna, petiolata; petiolus 5 mm. longus, pubescens, supra canaliculatus et glandulosus; lamina obovata, acuminata, basi rotundata vel attenuata, 7-9 cm. longa, 3-4.5 cm. lata, supra costa interdum glandulosa excepta subglabra, subtus glabra vel costa et nervis pubescentibus; nervi laterales utrinque circiter 6. *Pedunculi* axillares, plerumque 3-flori, glandulosi, et saepe ad apicem versus minute pubescentes. *Bractae* glandulosae, 4 mm. longae, lanceolatae, virides. *Pedicelli* 6-7 mm. longi, basi saepe bibracteolati, bracteolis 1 mm. longis. *Calyx* 5-lobatus, extra glandulosus et ad apices loborum minute pubescens, intus villosus; tubus 1 mm. longus; lobi sub anthesi 2.5 mm. longi, acuti, basi 2 mm. lati. *Corolla* late campanulata, glabra, fere ad basin 5-lobata; tubus vix

1 mm. longus; lobi oblongi, 4 mm. longi, obtusi, recurvi. *Stamina* 10, per paria corollae lobis opposita; filamenta vix ulla; antherae villosae. *Ovarium* villosum, basi disco leviter lobato circumcinctum. *Styli* 5. *Fructus* globosus, c. 2 cm. diametro, breviter et molliter pubescens, calyce persistente, lobis nunc c. 1 cm. longis plus minusve reflexis, suffultus.

NYASALAND. Zomba, c. 810–900 m., “mchekecheta,” Nov. 1915, *Purves* 260 (type). Shire Highlands, “mgulakula,” *Buchanan* 271 (comm. Hort. Bot. Edin. Dec. 1881). Without locality, 1895. *Buchanan* 276 (B.M.). Chigamula reserve, “nkukukulu” (Yao), *Topham* 740 (O.). Zomba district, “ndima” (Nyanja, Yao and Ngoni), Jan. 1932, *Clements* 198 (O.). Without locality *Clements* 276, 374, 443 (O.).

The timber is used for poles; the leaf extract as a cure for diarrhoea; the bark for constipation (*Clements*).

Like the following species, *R. amnicola*, *R. zombensis* has been confused for some time with *R. macrocalyx* from which they are both readily distinguished by the narrow green bracts and the form of the fruiting calyx, for in *R. macrocalyx* the calyx tube and lobes both enlarge and the lobes broaden so that the fruit is more or less enclosed; in *R. amnicola* and *R. zombensis* the lobes elongate, and as they become only slightly broader, do not enclose the fruit and are usually more or less reflexed.

Both *R. amnicola* and *R. zombensis* grow to be quite large trees, and in this way they are very different from the other species of *Royena*, which are usually shrubs.

4. *Royena amnicola* B. L. Burtt, species nova ad praecedentem *R. zombensem* magis accedit; ceterum *R. macrocalyci* Gürke affinis, sed, praeter habitum, bracteis linearibus vel lanceolatis viridibus, calycis lobis fructus maturi lanceolatis inter alia facile distinguitur.

Arbor usque ad 16 m. alta. *Ramuli* novelli basi perulati, primum dense piloso-pubescentes, demum glabrescentes. *Perulae* infimae squamiformes, brunneae, sensim in folia transeunt. *Folia* alterna, petiolata, in eadem arbore satis variabilia, obovata (c. 7–8.5 cm. longa et 3–5 cm. lata) usque ad suborbicularia (c. 6.5 cm. longa et 5.5 cm. lata), semper breviter et abrupte acuminata, basi rotundata vel truncata, margine integerrima saepe leviter undulata, supra tenuiter subtus densius pubescentia et sparse, ad nervos densius glandulosa; nervi laterales utrinque circiter 6, cum costa supra impressi subtus prominuli; petiolus 5 mm. longus, pubescens et glandulosus, supra canaliculatus. *Pedunculi* axillares, dense pubescentes, saepissime triflori. *Bracteae* 3 mm. longae, lineares vel lanceolatae, virides, pubescentes. *Pedicelli* 5 mm. longi, pubescentes, basin versus bracteolis 2 1 mm. longis linearibus instructi. *Calyx* 4–5-lobatus, utrinque villosus-pubescent, tubus 1 mm. longus; lobi 4 mm. longi, basi 2 mm. lati, acuti. *Corolla* late campanulata fere ad basin 4–5-lobata; tubus vix 1 mm. longus; lobi 5 mm. longi, dimidio superiore recurvi, obtusi, dorso leviter carinati et pubes-

centes, cetera glabri. *Stamina* 8–10, per paria corollae lobis opposita; filamenta vix ulla; antherae 2 mm. longae, dense villosae. *Ovarium* villosum, basi disco 10-lobato cinctum, 8–10-loculatum, loculis uniovulatis. *Stylus* 2 mm. longus, fere ad basin 5-partitus, superne leviter, inferne densius, pubescens. *Fructus* globosus, pubescens, 2.5–3 cm. diametro, 8–10-sperma, calyce accrescente lobis reflexis 2.7 cm. longis suffultus. *Semina* brunnea, 1.2 cm. longa, 0.8 cm. lata.

TANGANYIKA TERRITORY. Mpwapwa, Kikombo streams and Matamondo river, 1050–2000 m., “thick canopied tree 20–35 ft.; flowers small and white, dark, finely reticulate bark; locally common in riverine fringing forest of *Ficus vallis-Chaudae*, *Acacia*, etc.” 3/xii/1933, *B. D. Burtt* 5011. Mpwapwa, Kikombo Valley, 1200 m., “tree 30 ft. high with small white flowers; locally common in riverine fringing forest composed largely of *Ficus vallis-Chaudae*,” 1/xii/1933, *B. D. Burtt* 5041. Mpwapwa, junction of Buffalo and Iringa creeks, c. 1110 m., “tree near dry river bed” 24/iv/1933, *Mr. and Mrs. Hornby* 525. Mpwapwa, 1050 m. “small tree 15 ft. tall on brown soil in *Acacia-Deinbollia* formation, not uncommon,” 12/i/1932, *Hornby* 420. Mpwapwa, c. 1000 m., “tree to 50 ft., leaves covered with soft hairs, large fruits; in fringing forest by edge of stream,” 12/iii/1933, *Mr. and Mrs. Hornby* 523. Plain of Little Ruaha River, 45–65 miles south of Dodoma, “a common spreading tree of 25 feet with variegated red and yellow leaves and ‘ball’ fruit,” 22/ii/1932, *Lynes* P.r. 39. Morogoro district 1290 m. “tree 6 ft.; flowers white, poles used in native roofs,” “nyakititu” (Kiswahili), 18/ii/1932, *Wallace* 299.

5. *Royena Fischeri* (Gürke) Gürke ex Mildbraed in Notizblatt Bot. Gart. Berlin, 9, 1055 (1926). *Diospyros Fischeri* Gürke in Engl. Bot. Jahrb. 14, 311 (1892).

TANGANYIKA TERRITORY. Mwanza, Masura, 3/vi/1922, *Swynnerton* 1086 (B.M.), Tindi, c. 40 km. north of Nzega, 17/xii/1928, *Carnochan* 116 (B.M.). Shinyanga, 1080 m. “compact shrub 6–10 ft. high, fruits as large as cherries; common on copjes and bare hillsides,” 25/v/1931, *B. D. Burtt* 2432. 45 miles north of Tabora, “roots rubbed on the teeth said to produce a startling whiteness; medicine from roots used for stomach trouble of infants,” “mlamata” and “nyakititu” (Kiswahili), “msindilo” (Kingasa), “msubata” (Kisumkumu), 8/xii/1926, *Wallace* 5. Kondoa district, Simba hills near Amathle, 1350 m. “a shrub to 6 ft. high in waste land near riverine forest,” “benjero” (Irangi), 14/xii/1927, *B. D. Burtt* 807. Kondoa-Irange at Mkalama, “common shrub of rockland and on the escarpment,” 1/xi/1925, *B. D. Burtt* 345. Kondoa district, Mondo, 1350 m. “a shrub to 6 ft. high in waste rocky places,” “mbanjiru” (Irangi), 5/i/1928, *B. D. Burtt* 1024. Manyoni district, Kazikazi, 1200 m., “common; a finely reticulate dark brown-barked shrub or small tree 10 ft. high; flowers very

watery white and attractive to bees; on 'semi-mbuga' grey clay soils with *Combretum ternifolium* and *Acacia senegal*," 17/xii/1933, B. D. Burtt 4975.

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XXVI—A REVISION OF THE CHARACTERS OF NEODREGEA. S. GARSIDE (Bedford College).

The recent discovery of *Neodregea Glassii* C. H. Wright at Somerset West, Cape Province, South Africa, has enabled the author to study this rare liliaceous plant in its natural habitat, and to correct some errors in the original generic description which were no doubt due to the inadequate material then available.

Previous to its discovery at Somerset West, this monotypic genus was known only from the vicinity of Grahamstown, from which locality its discoverer, James Glass, sent immature fruiting material (*Glass* 674) to Kew, in 1896.

Plants in the flowering condition, collected by J. L. Drège "in damp ground at Cradock Place," and also "at Baakens River," both near Port Elizabeth, were collected in May 1909, and fruiting material in August of the same year. This material was sent to Kew by Dr. S. Schönland, and from it the excellent figure in "Hooker's *Icones Plantarum*" (Wright, 1913) was made. Fig. 4, giving details of the flower, is from the latter work. The only subsequent record of this plant, until the present observations were made, was by Miss Florence Paterson, also near Port Elizabeth. (*Paterson* 1162, Bethelsdorp, Aug. 1916. In *Herb. Bolus*.)

In August, 1929, the present writer found plants in some abundance on the lower southern slopes of Helderberg, on the farm Parel Vallei, Somerset West. They were bearing fruits with ripe seeds. (*Garside* 4053).

Its occurrence at Somerset West, about 390 miles west of Port Elizabeth, indicates that it may have a wide distribution, but owing to its small size and peculiar habitat, it has been overlooked by collectors.

An intermediate locality was indeed subsequently found by Miss A. V. Duthie, who obtained it at Knysna (*Duthie* 1131, Belvidere Church, Knysna, June 1931).

Unlike most South African *Liliaceae*, *Neodregea Glassii* is a shade-loving plant, and at Somerset West grows in damp soil under small veld bushes (1 to 2 metres high) of *Leucadendron adscendens* R. Br., *L. lanigerum* Buek., *Cliffortia ruscifolia* L., and *C. polygonifolia* L.; associated with it in the undergrowth are a few plants of *Ianthe flaccida* Nel., and some *Oxalis* spp., these being somewhat etiolated, and obviously growing under unfavourable conditions. Patches of small mosses are also frequent, but there is much bare soil.

In this very shaded habitat, the light intensity was found to be only one fifteenth that of full sunlight, this observation being made by means of a photographic actinometer (recording blue light only), at noon on Aug. 12, 1929, the sky being cloudless.

The shade temperature under the bushes was 26.5°C, the shade temperature in the open being 28°C, taken at the same time and date as the record of light intensity.

No plants of *Neodregea* were found exposed to full sunlight, and it is to be regarded as a typical "forest floor" plant, the canopy being composed of the low-growing proteaceous and rosaceous shrubs already mentioned.

A full grown plant is only from 4 to 6 cm. in length, about one half of this being the underground portion (Figs. 1, 2, and 3). The pyriform storage organ (Figs. 11, 11a, 12) was originally described as a bulb (*Wright* 1909), and superficially it has the appearance of one. However, its central portion (Fig. 12, C) consists of the greatly enlarged base of the flowering stem of the current year, and the membranous sheath which completely covers it is the leaf-base of the lower foliage leaf (Fig. 12, S). The storage organ is therefore a corm, and a longitudinal section shows a central swollen, starch-containing stem, covered by alternating leaf-bases and withered stem-bases, the latter being the remains of the corms of previous years. The old corms, one of which is shown in section in Fig. 12, OC, and in surface view in Figs. 11 and 11a, are arranged at one side only of the functioning corm, and the entire structure is therefore symmetrical about a vertical plane passing through the point of attachment of the old corms to the stem-base. Fig. 12 shows a section in this plane, all old corms except one having been removed.

Near the line of attachment of the innermost leaf-sheath, but separated from it by a ridge of tissue from which adventitious roots will later take their origin, the corm bears a small bud (Fig. 12, B), which can be regarded as standing in the axil of the sheathing leaf-base of the lower leaf. This bud will produce the flowering axis and leaves of next season's growth, drawing its food supplies from the corm to which it is attached during the early period of its development. The parent corm when exhausted is pushed to one

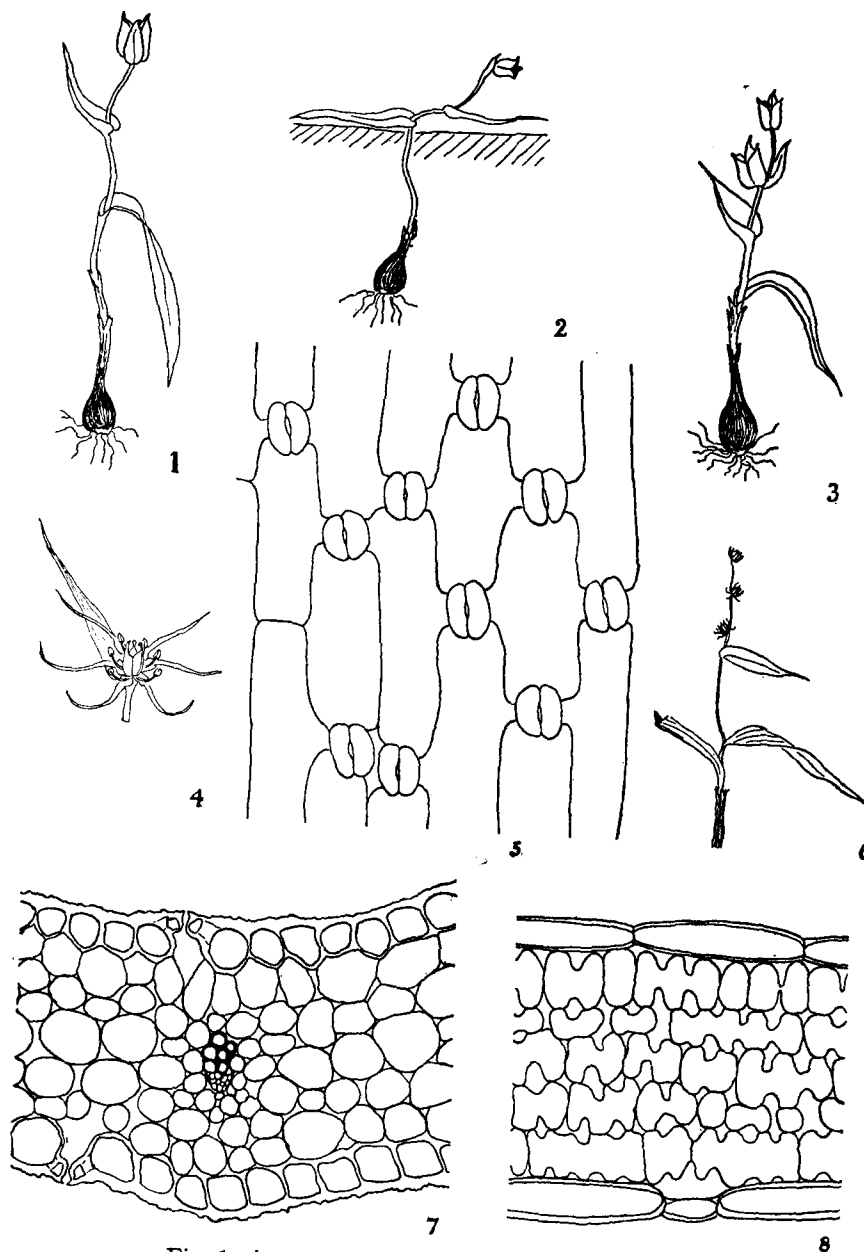


Fig. 1. An erect plant with a terminal fruit, $\times 1$.

Fig. 2. A prostrate plant, the effect of phototropic curvature, $\times 1$.

Fig. 3. A plant with three leaves, the uppermost leaf simulating a bract, $\times 1$.

Fig. 4. A flower and upper leaf. From Hooker's Icones 2931.

Fig. 5. A small portion of the upper epidermis from the middle of the lowest leaf, $\times 250$.

Fig. 6. Upper portion of a plant with three flowers, showing internode between lowest flower and uppermost leaf, $\times 1$. (Duthie, 1131).

Fig. 7. Transverse section of lowest leaf, $\times 250$.

Fig. 8. Longitudinal section of lowest leaf, $\times 250$.

side, forming a flattened, oval scale, devoid of starch, and bearing at its base the adventitious roots (Fig. 12, R) which have been produced below the bud which has developed into a new corm. The branch system is therefore sympodial.

The foliage leaves are usually two in number (Figs. 1, 2 and 3). The lower leaf has a sheathing base which covers the corm; its lamina (20 to 25 mm. long, 3 to 4 mm. wide) often extending along the surface of the soil in the fruiting plants examined at Parel Vallei. The upper leaf is amplexicaul, its lamina is smaller, and owing to the frequent obliquity of the stem, it also is sometimes almost in contact with the ground (Fig. 2).

The lower leaf has a thin lamina, with a well marked median vein, and about four smaller veins parallel to it in each half of the lamina,

The anatomy of the leaf is that characteristic of shade plants the mesophyll being 6 or 7 cells in thickness, a slightly differentiated palisade layer of elongated lobed cells being developed towards the upper (adaxial) surface (Figs 7 and 8). In transverse sections all the mesophyll cells appear circular in outline, and there are numerous intercellular spaces (Fig. 7).

The stomata (Fig. 5) are small, but very numerous on both surfaces of the leaf.

Counts were made from portions of both the upper and lower epidermis taken from the middle of the lower leaf, a little to one side of the midrib.

The upper (adaxial) epidermis was found to have 173 stomata per sq. mm., the stomatal index being 35.1, the corresponding lower epidermis having 133 stomata per sq. mm., and a stomatal index of 28.3.

Salisbury (1927) considers that a low stomatal index is characteristic of aquatics, whilst plants of drier habitats are characterised by higher indices, though he points out that comparatively few plants have as yet been examined from this point of view.

The mean stomatal index as given by Salisbury for the European *Scilla nutans* is 27.4, and for *Iris foetidissima* 34.5, both being woodland plants, these indices approximating to that of *Neodregea*, 31.7, which may also be considered as a plant of dry woodlands.

The inflorescence of *Neodregea* has some puzzling features. Wright (1909) described the plant as having a lower, sheathing leaf, and an upper, amplexicaul leaf, a spike of two to four flowers, and bracts similar to foliage leaves but smaller. If an inflorescence is carefully examined (Fig. 3), it will be seen that the lower flower does not stand in the axil of the "bract," but appears to be terminal, with a lateral pedicel in the axil of the "bract." Thus the branching would appear to be cymose. However, in examples bearing three flowers (Fig. 6) there is occasionally an internode between the "bract" and the first of the three flowers, and all the flowers are bractless. It seems therefore that the so-called "bract" is only a small upper leaf, which bears no flower in its axil, but which

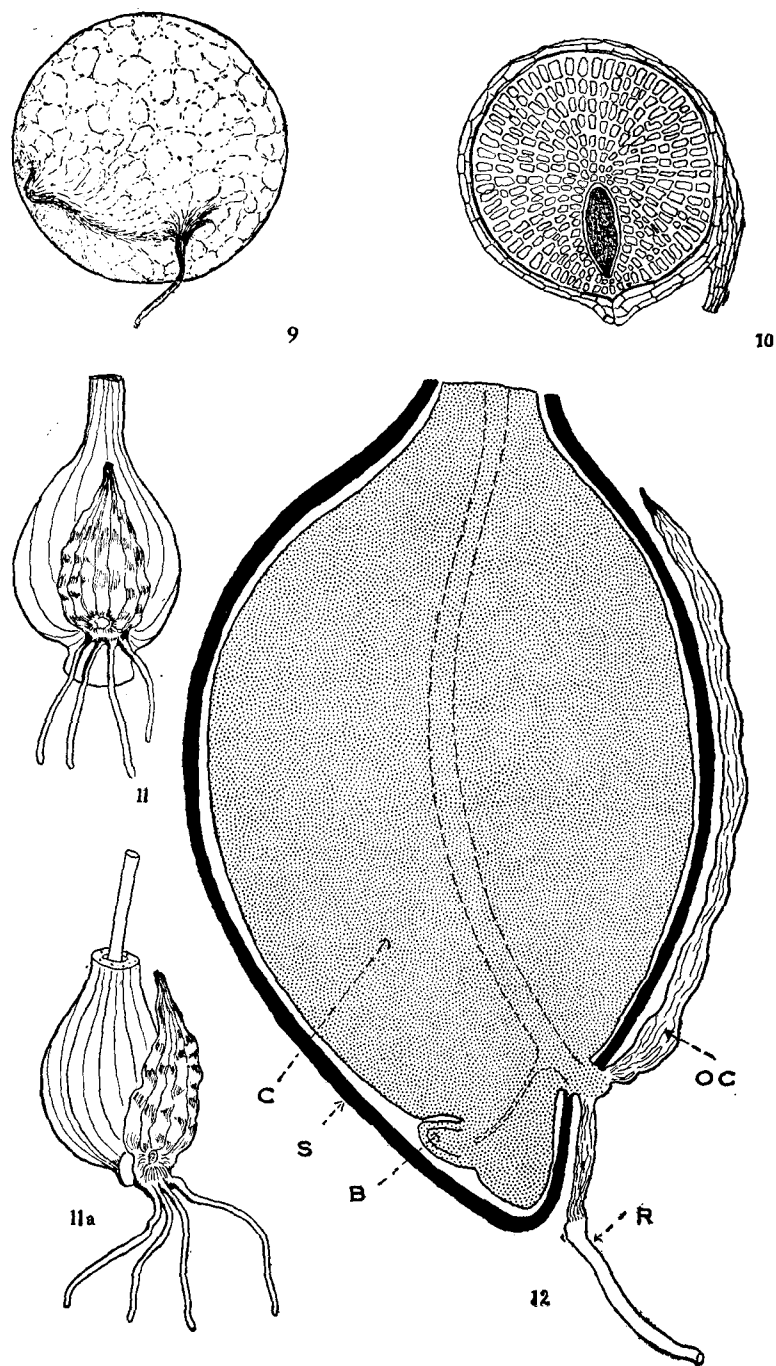


Fig. 9. The seed, showing micropyle and funiculus, $\times 50$.
 Fig. 10. Section of seed and upper part of funiculus, $\times 50$.
 Fig. 11. Corm, with dead leaf bases, and all old corms except one removed, $\times 5$.
 Fig. 11a. The same, viewed from the side and showing the aerial stem, $\times 5$.
 Fig. 12. Longitudinal section of the corm through the plane of symmetry, $\times 15$. B, bud of next year's shoot. C, corm of present year; the upper portion is continued into the leafy stem (not shown). OC, old corm of previous year. R, functional adventitious roots at base of old corm. S, leaf sheath of lowest leaf of present year. All old leaf bases of previous years removed.

gives the appearance of cymose branching when the internode between it and the lowest flower is suppressed. When there is a solitary, terminal flower, the leaf is often very reduced, and situated immediately below it (Fig. 2).

In the raceme of *Baeometra* also, the uppermost leaf is reduced and in a similar manner approaches the lowest flower; hence the description given by Baker (1897), "Bracts subulate."

Hutchinson (1934) who has recently revised and amended the section *Anguillarieae* Don. of the *Liliaceae*, gives the ebracteate inflorescence as a common character of the included genera, *Baeometra*, *Anguillaria*, *Neodregea*, *Dipidax* and *Wurmbea*.

These genera, with the exception of *Dipidax*, all have corms, and are all South African. *Dipidax*, which is Australian, is described as having a bulb, but requires re-examination, as it would appear to form an exception in an otherwise very natural group of genera.

The seeds of *Neodregea* were described as lenticular in shape (Wright 1909), perhaps because in the original specimens the fruits were young and contained only immature, shrunken seeds. This error has been copied into numerous texts, and Marloth (1915) made it one of the diagnostic characters of *Neodregea* in his key to the genera of the *Liliaceae*.

The mature seed however, is quite spherical, .7 mm. in diameter, the brown finely reticulate testa having a low ridge joining the small, papilliform micropyle to the point of attachment of the funiculus (Fig. 9).

The copious endosperm consists of cells which radiate away in rows from the almost starch-free and relatively large embryo which is situated in the micropylar half of the seed. The endosperm cells have thick cellulose walls, and contain abundant protein granules and oil drops.

There is a long, delicate funiculus attaching the seed to the margin of the carpel.

SUMMARY.

A re-examination of *Neodregea Glassii* C. H. Wright, from a new locality (Somerset West) has shown that it is a shade plant growing underneath veld bushes. Contrary to the original description, the rootstock is a corm, the inflorescence ebracteate, and the seeds spherical.

Fig. 11a. The same, viewed from the side and showing the aerial stem, $\times 5$.
 Fig. 12. Longitudinal section of the corm through the plane of symmetry, $\times 15$. B, bud of next year's shoot. C, corm of present year; the upper portion is continued into the leafy stem (not shown). OC, old corm of previous year. R, functional adventitious roots at base of old corm. S, leaf sheath of lowest leaf of present year. All old leaf bases of previous years removed.

All figures except Figs. 4 and 6 drawn from *Garside* 4053. Figs. 1, 2, and 3 are from living plants. Fig. 6 is from herbarium material.

EMENDED DESCRIPTION.

Neodregea Glassii C. H. Wright (descr. emend.). Cormus ovoideus. Folia 3; folium inferius longe vaginans, medium amplexicaule, superius bracteam simulans. Flos terminalis, solitarius aut spica floribus 2-4 distantibus composita; bractea nullae. Semina per loculos singulos 4-6, sphaerica, valvarum marginibus interioribus utrinque affixa.

MATERIAL EXAMINED.

- Drège, J. L. Cradock Place and Baakens River, Port Elizabeth. May 27, 1909.
 Paterson, F. 1162. Bethelsdorp. Aug. 1916.
 Garside, S. 4053. Parel Vallei, Somerset West. Fruiting. Aug. 22, 1929.
 Duthie, A. V. 1131. Belvidere Church, Knysna. Flowering. June, 1931.
 Garside, S. 4195. Parel Vallei, Somerset West. Fruiting. Sep. 12, 1932.

LITERATURE CITED.

- BAKER, J. G. *Flora Capensis*, 6, 522 (1897).
 HUTCHINSON, J. *The Families of Flowering Plants*, 2, Monocotyledons, 98 (1934).
 MARLOTH, R. *The Flora of South Africa*, 4, 82 (1915).
 SALISBURY, E. J. "On the causes and ecological significance of stomatal frequency, with special reference to the woodland flora." *Phil. Trans. Roy. Soc. London, Series B*, 216, 1-65 (1927).
 WRIGHT, C. H. *Kew Bulletin*, 1900, 308-309.
 ——— *Hooker's Icones Plantarum*, 4th series, 10, t 2931 (1913).

XXVII—MELANESIAN PLANTS: I. B. L. BURTT.

During the years 1929-1932 Mr. J. H. L. Waterhouse collected extensively in the Solomon Islands on behalf of Kew, with the aid of a grant from the Empire Marketing Board. His first collections were made in the British Solomon Islands, chiefly in New Georgia, but also in adjacent small islands. Later he collected in Bougainville Island (in the Mandated Territory of New Guinea), partly in the small island of Buka and the adjoining mainland in the north-west, and partly at Siwai in the south-west. Material from these sources was also sent to Prof. S. J. Record of the Yale School of Forestry who has forwarded it to Kew for identification. Corresponding material in the main collection was also examined, and during the work a number of new species have been discovered,

some of which are described in the following paper. It is hoped to publish others later and the results of investigations carried out on plants from other Pacific Islands will be incorporated as seems convenient.

In the citation of specimens the letter Y prefixed to a number indicates that the specimen was received from Yale. The New Georgia collections are without a prefix-letter, but those received direct from Bougainville are distinguished by the letter B: a Y in brackets after such a number indicates that it was also received through Prof. Record and represents the same collecting.

Dillenia ingens B. L. Burtt [Dilleniaceae]; species nova *D. calothyrsae* Diels maxime affinis, sed floribus folisque multo maioribus, stipulis suborbicularibus et petiolo subtus haud acute carinato facile distinguitur.

Arbor c. 9 m. alta. *Stipulae* deciduae, magnae, suborbiculares, 4-5 cm. longae, 5-5 cm. latae, petiolo adnatae, extra dense lanatae. *Folia* alterna, magna, petiolata; petiolus 4-5 cm. longus, basi uti stipulae lanatus, glabrescens; lamina elliptica, 50-80 cm. longa, 25-40 cm. lata, pilis paucis subtus in costa exceptis glabra, ad basin plus minusve abrupte angustata, ad mucronem apicalem rotundata, marginibus leviter crenato-serrata; nervi laterales c. 30, validi, in media lamina inter se 2 cm. distantes, ad apicem atque basin propiores, angulo semirecto ascendentes, c. 5 mm. intra marginem furcati. *Flores* 5-6 in racemum flexuosum axillare dispositi. *Sepala* 5, libera, late elliptica, scaphiformia, c. 4 cm. longa et 4-5 cm. lata, post anthesin carnosio-incrassata carpella includentia. *Petala* non visa. *Stamina* numerosa filiformia, 2 cm. longa, glabra, flaccida tantum visa. *Carpella* 10, axe cohaerentia, 1 cm. alta, in stylos 1-5-2 cm. longos producta, glabra. *Ovula* ex carpelli angulo interiore biseriata, c. 14, arillata, glabra. *Fructus* juvenilis (i.e. carpella sepalis persistentibus inclusa) 3-5 cm. diametro.

SOLOMON ISLANDS. Bougainville Island, Siwai, "a small tree (to about 30 ft.) with large leaves and fruit suggestive of small rosy red apples in appearance," Aug. 1931, *Waterhouse* B.510 (type); "tree about 40-50 ft., very handsome with large dark-green leaves and brightly coloured buds like small rosy and yellow apples; wood splits easily and said to harden with age," 1932, *Waterhouse* Y.25. Solomon Islands, chiefly New Georgia, 1894-95, *Officers of H.M.S. "Penguin."*

Vernacular names, *kauhana* (Siwai); *hebere* (Roviana, New Georgia).

It is unfortunate that the material of *D. ingens* consists of leaves and young fruits only, but, as it is easily distinguished from *D. calothyrsa* Diels by the characters given in the diagnosis, it seems safe to describe it as a new species. The petals are probably, as in other members of the genus, large, thin and soon caducous. After flowering the sepals close over once more and become fleshy; the

young fruits, therefore, look very like buds, but on opening them the withered stamens are found inside and there are no petals.

In the present state of our knowledge it seems advisable to describe this plant as a *Dillenia*, but if the genus *Wormia* shall eventually be found distinct, *D. ingens* may have to be transferred to it. *Dillenia* is distinguished in the Genera Plantarum¹ by having its carpels coherent at the axis: in *Wormia* they are free. Martelli², however, did not consider this a sufficient distinction and united the two genera under the earlier name *Dillenia*, a course which was followed by Diels³ in his account of the New Guinea species. Gilg and Werdermann⁴ retained both genera, emphasising as the distinguishing character not so much the coherence of the carpels as the presence of an aril around the seed in *Wormia* and its absence in *Dillenia*. In general facies, however, the two genera are so much alike that it seems probable that this classification will be found artificial and for that reason the genera are treated as synonymous pending a critical revision of the group.

Melicope grandifolia B. L. Burtt [Rutaceae]; species nova trifoliolata in sectione *Entogano* Engler ob stamina alternantia breviora, calycis lobos acutos et sepala extra subaspere pubescentia iuxta *M. trachycarpam* Lauterb. verisimiliter ponenda. Cuius a descriptione floribus numerosis, petalis extus glabris, foliolis maioribus breviter acuminatis (nec longe cuspidatis) subtus in costa minute pubescentibus differt.

Arbor parva. *Folia* opposita, exstipulata, trifoliata; petiolus 10–16 cm. longus, supra leviter sulcatus, minutissime puberulus; petioluli 5 mm. longi, supra canaliculati; foliola dense pellucido-glandulosa, obovato-oblancoolata, plerumque 17–25 cm. longa et 7–10 cm. lata, terminale lateralibus paullo maius, apice breviter acuminata, ad basin longe cuneata, marginibus integerrimis levissime revolutis, supra sub microscopio minute sed conspicue reticulata, utrinque sparsissime pilis minutis instructis. *Flores* unisexuales. *Inflorescentia* ♂ e paniculis axillaribus ad apices ramorum versus petiolis aequilongis; axis et rami breviter pubescentes; rami oppositi, bracteis 0.5 mm. longis suffulti; flores 3–5 in pedunculo 1–3 mm. longo specie umbellati, pedicellis 2 mm. longis bracteis minutis suffultis. *Calyx* 1 mm. longus ultra medium 4 lobatus, lobis deltoideis acutis, extra pubescens. *Petala* 4, libera, elliptica, 2.5 mm. longa, 1.25 mm. lata, apice inflexo-mucronata, apicibus ipsis pubescentibus exceptis glabra. *Stamina* 8, omnia fertilia, 4 petalis opposita minora 2 mm. longa, 4 petalis alternantia 2.5 mm. longa, filamentis complanatis a basi ad apicem angustatis glabris, antheris 0.5 mm. longitudinis haud attingentibus. *Discus* crassus,

¹ Benth. and Hook. fil., *Genera Plantarum*, 1, 13 (1862).

² Martelli in Beccari, *Malesia*, 3, 154 (1886).

³ Diels in Engl. Bot. Jahrb. 57, 436 (1922).

⁴ Gilg and Werdermann in Engl. u. Prantl, *Natürl. Pflanzenfam.* 2 Aufl., 21, 33 (1925).
300

8-lobatus. *Gynaecium* inchoatum. *Inflorescentia* ♀ c. 15 cm. longa, ramosa, floribus in fasciculas oppositas dispositis; pedicelli 1 mm. longi, bracteis suffulcentibus longiores; calyx et petala ut in flore ♂. *Stamina* inchoata parva. *Discus* parvus. *Ovarium* 1 mm. altum, pubescens, conspicue 4-lobatum, 4-loculare, ovulis in loculis 2 superpositis. *Fructus* ignotus.

SOLOMON ISLANDS. Bougainville Island, Siwai, "a tree with masses of small creamy yellow blossom," Aug. 1930, *Waterhouse* B.227 (Y.122).

Vernacular name, *hongoponipo*.

Fagara megistophylla B. L. Burtt [Rutaceae-Xanthoxyleae]; species nova inter species gerontogaeas (asiaticas et australienses) subsectionis *Paniculatarum* sectionis *Macqueriae*¹ ob folia et inflorescentiam permagnam praestans. Iuxta *F. giganteam* Handel-Mazzetti, quam non vidi, et *F. integrifoliolam* Merrill verisimiliter ponenda.

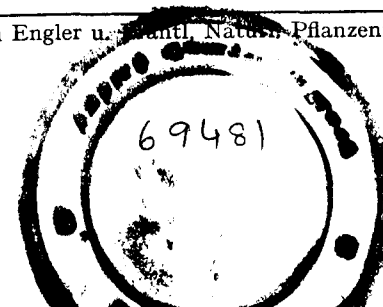
Arbuscula vel arbor parva, dioica, inermis. *Folia* alterna, permagna, imparipinnata, usque ad 90 cm. longa; petiolus 10–25 cm. longus, c. 5 mm. crassus, glaber; foliola 4-jugis, lateralia basi inaequalia, petiolulis c. 5 mm. longis instructis, infima c. 12 cm. longa et 8 cm. lata, ad apicem versus rotundata, breviter acuminata, basi rotundata, superiora gradatim maiora, supremi iugi oblongo-elliptica, ad 35 cm. longa et 13 cm. lata, basi plus minusve rotundata, apice acuminata; terminale etiam maius, rhachidis suprema parte cum petiolulo 7–9 cm. longa; omnia integerrima, glabra, supra nitentia, pellucido-punctata; rhachis glabra, partibus interiugalibus c. 14 cm. longis. *Inflorescentia* axillaris ♂ et ♀ consimiles, ad 30 cm. (statu fructifero) longa, dimidio superiore ramosa, ramis c. 10 cm. longis iterum ramosis. *Flores* utrius sexus in alabastro tantum visi. *Alabastra* ♂ 2.5 mm. longa, pedicello 0.5 mm. longo, calyce leviter 4-lobato vix 1.5 mm. longo, petalis 4 imbricatis c. 2.5 mm. longis, staminibus 4, filamentis vix 1 mm. longis, antheris dorsifixis 1.5 mm. longis, ovarii rudimento perparvo. *Alabastra* ♀ calyce petalisque ut in flore ♂, staminibus nullis, ovario e carpellis duobus ima basi et stigmatibus leviter cohaerentibus cetera liberis c. 1.5 mm. longis, stylis sublateralibus, stigmatibus capitatis, 0.5 mm. longis instructis. *Fructus* carpello uno saepe abortivo, altero c. 1 cm. longo, medio dehiscente, semine uno nigro nitente.

SOLOMON ISLANDS. Bougainville Island, Siwai, "small tree about 30 ft., with clusters of small black seeds," Dec. 1932, *Waterhouse* Y. 167 (♀ buds and fruits); "a shrub or small tree with masses of black seeds," Oct. 1930, *Waterhouse* B.344 (fruits: type); "small tree 15–20 ft.," Jan. 1932, *Waterhouse* Y.5 (♂ buds).

Vernacular name, *kiha*.

F. megistophylla is remarkable for the large size of its leaves, and on this account I am unable to find any close affinity for it. It

¹ See Engler in Engler u. Prantl, *Natürl. Pflanzenfam.* 2 Aufl. 19 A. 217 (1931).



also differs from most of the asiatic species, including *F. integrifoliola* Merrill, to which it may otherwise be allied, in not producing thorns or prickles.

Canarium salomonense B. L. Burtt [Burseraceae]; species nova ad subsectionem *Auriculatum* sectionis *Regressivorum*¹ referenda. *C. Harveyi* Seem., speciei tongensi, proxima sed foliis paucioribus et latioribus abrupte breviter et obtuse acuminatis differt. *C. quadrangulare* H. J. Lam et *C. lian* H. J. Lam etiam affinis, ab illo foliis latitudine sua nunquam duplo longioribus fructibusque maioribus, ab huius descriptione, specimine a me non viso, floribus maioribus et pseudostipulis minoribus recedit.

Arbor c. 18 m. alta, ramulis novellis, cum petiolis et rhachidibus et inflorescentiis, griseis striatis minute pubescentibus. *Folia* alterna, imparipinnata; petiolus 4-5-8 cm. longus, pseudo-stipulis c. 3 mm. longis et 2 mm. latis extra pubescentibus ramulo 1-1.5 cm. distante praeditus, parte inferiore supra leviter canaliculatus, parte superiore subteres; rhachis 2.5-4.5 cm. longa; foliola biuga, lateralia petiolulis 1-2 cm. longis instructa, terminale petiolulo 2.5-4 cm. longo, petiolulis apice incrassatis; foliola omnia plus minusve eiusdem formae, ovata ad late elliptica, plerumque 8-14 cm. longa et 5-9 cm. lata, apice in acumen obtusum c. 5 mm. longum subabrupte angustata, basi rotundata, marginibus integerrimis, supra nitida, utrinque oculo nudo glabra, sed sub microscopio foliola iuniora pilis minutis hyalinis instrui videntur; costa subtus prominens, striata, supra prominula; nervi laterales c. 10, rete venarum utrinque prominulo. *Inflorescentia* (♀?) terminalis, ramosa, c. 20 cm. longa, ramis ad 6 cm. longis, floribus pedicellis c. 3 mm. longis instructis. *Calyx* crassus, tubo 2.5 mm. longo,² lobis 3 1 mm. longis basi fere 4 mm. latis, extra breviter ferrugineo-pubescentibus, intus glaber. *Petala* 3, libera, 7 mm. longa, 5 mm. lata, apice incrassato-inflexo-mucronata, intus glabra, extra dorso appresse pubescentia. *Stamina* 6 (? fertilia), filamentis 2 mm. longis glabris, antheris 2 mm. longis. *Discus* 6-lobatus, lobis staminibus alternantibus apice irregulariter dentatis 2 mm. altis. *Ovarium* glabrum in receptaculo concavo, cum stylo et stigmatibus 5 mm. altum; pars basalis 1 mm. longa, cylindrica, 1 mm. diametro, supra in partem crassam 2 mm. altam 2.5 mm. diametro subito dilatata, haec in stylum 1 mm. longum stigmatibus 3 coronatum iterum abrupte angustata; stigmata in lateribus minute ferrugineo-pubescentia; ovarii loculi 3, in parte basali locati, uniovulati. *Fructus* c. 3 cm. longus et 2 cm. diametro, pericarpio carnosio, putamine osseo, calyce persistente suffultus.

¹ H. J. Lam in Bull. Jard. Bot. Buitenzorg, ser. III. 12, 425 (1932).

² This measurement is taken internally from the attachment of the petals to the base of the sinus between the calyx lobes. Externally the hollow receptacle is indistinguishable from the calyx tube, which thus appears about 4 mm. long.

SOLOMON ISLANDS. Bougainville Island; Maisua, 18 Sept., 1931, *Waterhouse* B.545 (buds); Tonu, Siwai, "a tree about 60 ft. high and 4 ft. in circumference," fruits in September, 1932, flowers from same tree, undated, *Waterhouse* B.725 (Y.73: type).

Vernacular name, *kuhurima*.

From an examination of the dried flowers described there is no evidence that they are not hermaphrodite, the stamens and anthers being well-developed. Lam, however, states that all the species of *Canarium* are dioecious, and as the stamens are more or less strongly developed in the female flowers of some species, it is probable that further collecting will show that *C. salomonense* is also dioecious. The hollow receptacle described here is said by Lam to be more developed in female than in male flowers.

Vavaea bougainvillensis B. L. Burtt [Meliaceae]; species nova ad *V. pilosam* Merrill, speciem philippinensem, maxime accedit sed foliis magis obtusis, petiolis brevioribus et calycis lobis brevioribus et latioribus distinguitur.

Arbor 7.5-9 m. alta. *Ramuli* partibus hornotinis pilis c. 1 mm. longis recte patentibus densissime vestiti, foliati et inflorescentias axillares gerentes, partibus annotinis glabrescentibus, cicatricibus foliorum et inflorescentiarum delapsorum notati, partibus vetustioribus cortice corrugato fere glabri. *Folia* ad apices ramorum versus disposita, petiolata; petiolus c. 1-2 cm. longus, densissime pilosus; lamina late oblanceolata vel obovata, plerumque 15-20 cm. longa, 9-10 cm. lata, apice plus minusve rotundata ad acuta, plerumque breviter et late acuminata costa in mucronem excurrente, ad basin versus sensim vel abrupte angustata, marginibus integerrimis leviter undulatis, utraque facie et marginibus tenuiter, in costa et nervis dense, pilis mollibus fere 1 mm. longis vestita; nervi laterales utrinque 12-17, ad basin laminae angulo fere recto, ad apicem angulo c. 60° patentibus, intra marginem arcuati, subtus prominentes. *Flores* cymosi, ad apicem pedunculi axillaris dispositi; inflorescentia 5 cm. diametro haud excedens; pedunculus 4-9 cm. longus, ut pedicelli pilis recte patentibus densissime vestitus. *Calyx* 2 mm. longus, leviter 4-lobatus, extra pubescens. *Petala* 4, valvata, crassa, 7 mm. longa et 4 mm. lata, apice inflexo-mucronata, utrinque brevissime pubescentia. *Tubus staminum* in lacinias c. 13 inaequales antheriferas intus dense barbatus divisus; cum antheris 3 mm. altus. *Discus* parvus faciem anteriorem tubi staminum adherens. *Ovarium* 4-loculare, ovulis in loculis solitariis, cum stylo 5 mm. altum; ovarium et stylus dimidio inferiore villosus; stylus dimidio superiore glaber; stigma magnum, capitatum. *Fructus* non visus.

SOLOMON ISLANDS. Bougainville Island; Siwai, "a small tree 25-30 ft. in height on bank of stream," Nov. 1932, *Waterhouse* B.803 (type); Siwai, "a tree about 25-30 ft. in height with spreading habit on bank of a frequently dry watercourse" Dec. 1932, *Waterhouse* Y.157.

Vernacular name, *mono*.

Vavaea bougainvillensis is especially interesting as it is more closely allied to *V. pilosa* Merrill from the Philippines than to any species so far described from New Guinea. Although originally regarded as typically Polynesian it now seems probable that the genus has its centre of distribution in the Philippines and Malay Islands. *V. amicorum* Benth., the type species of the genus, was described from the Tonga Islands and has since been recorded from Fiji, New Guinea and the Philippines. I have seen no material from the latter, but that from Fiji in the Kew Herbarium is probably distinct from the Tongan species, differing in its thicker leaves, smaller calyx-lobes and obtuse flower-buds. The limits of the species are not, however, easily definable, and a critical examination of all the available material is required.

In working out this species it was found that *Vavaea pauciflora* Ridley from New Guinea is antedated by a species of the same name from the Caroline Islands. The following new name is therefore proposed:—

Vavaea oligantha B. L. Burt nom. nov. *V. pauciflora* Ridley in Trans. Linn. Soc. Bot. 9, 26 (1916)—non Volken in Engl. Bot. Jahrb. 31, 465 (1901).

Leea tetramera B. L. Burt [Vitaceae]; species nova ab illis in Nova Guinea et insulis Salomonis adhuc repertis ob staturam, flores tetrameros¹ et stipulas petiolo fere aequilongas distinguenda. In sectione *Viridiflorarum* (C. B. Clarke) Gilg² et in serie *Pycnoneurarum* (C. B. Clarke) Gilg ob serras nervis primariis numero aequales ponenda, sed ad species quasdam philippinenses, *L. congestam* Elmer *L. philippinensem* Merrill et affines, ab auctoribus ad nullam sectionem relatas, magis accedit et cum eis seriem novam, a *Pycnoneuris* nervis lateralibus distantioribus et floribus tetrameris³ recedentem, verisimiliter effecunt.

Arbor parva 6–7.5 m. lata, ramulis breviter et tenuiter ferrugineo-tomentellis. *Folia* simpliciter pinnata, petiolata, stipulata; petiolus c. 10 cm. longus supra profunde canaliculatus, subtus obtuse carinatus costis c. 7 instructus, ut rhachis et petioluli ferrugineo-furfuraceus et glandulis nigris obsitus; stipulae in alabastro connatae, petiolo fere aequilongae, deciduae; foliola 3-iuga, iugis inter se 6–8 cm. distantibus, petiolulata; petioluli laterales 8–12 mm. longi, terminalis ad 4.5 cm. longus; rhachis subteres, nodis (in sicco) constricta: foliola iugi infimi ovato-elliptica, c. 13 cm. longa et 6.5 cm. lata, duorum distalium oblongo-elliptica ad 20 cm. longa et 7 cm. lata, terminale obovatum vel obovato-ellipticum, ad 20 cm. longum et 9 cm. latum, omnia discoloria, apice in acumen 1.5 cm. longum producta, basi rotundata (infima) ad angustata (terminale), marginibus distanter crenato-serrata serris nervis primariis c. 14 numero aequalibus, supra glabra, subtus parce pubescentia

¹ Very rarely a pentamerous flower is found.

² C. B. Clarke in Journ. of Bot. 19, 135 (1881). Gilg in Engl. u. Prantl, Natürl. Pflanzenfam. 3, 5 Abt. 455 (1896).

et nigro-glandulosa. *Inflorescentia* more generis oppositifolia, ramosa, paniculata; rami, et praecipue ramuli ultimi, verrucosi et minute pubescentes; flores ad apices ramulorum 2–4-nati, pedicellis vix 2 mm. longis. *Calyx* campanulatus 4-lobatus extra parce et breviter pubescens glandulis paucis intermixtis, tubo 2.5 mm longo, lobis 1.5 mm. longis triangularibus. *Corolla* e petalis 4 valvatis, basi inter se et cum disco coniunctis parte connata 3 mm. parte libera 5–6 mm. longa, 2 mm. lata, apice callosa-inflexo-mucronatis. *Stamina* 4, ut in genere filamentis inter lobos disci, antheris in alabastro intra discum inflexis; disci³ lobi 4, 4 mm. longi apice breviter bicornuti, basi extra cum petalis connatis intus in partem liberam 1.5 mm. longam prolongata. *Ovarium* glabrum, quadriloculare, ovulis in loculis solitariis, 1 mm. altum, stylo striato 3 mm. longo instructo.

SOLOMON ISLANDS. Bougainville Island, Siwai, "a small tree with white blossom, fruit much sought after by pigeons," June, 1930, *Waterhouse* B.78 (type); "a small tree about 20–25 ft.," June, 1931, *Waterhouse* B.461; "a tree with heavy reddish timber," Nov. 1932, *Waterhouse* B.785 (Y.139).

Vernacular names—*kuuko*, *kuuku* or *ku'u ku'u* (Siwai); *tavuruwu* (New Britain); *bau* (Teop).

Leea tetramera is of especial interest from the phytogeographical standpoint, for, as in the case of *Vavaea bougainvillensis* described above, it shows a closer affinity with species from the Philippine Islands than with any from New Guinea. As has been suggested in the diagnosis, this plant and its allies should probably form a new section of the genus characterised by the tetramerous flowers, rather distant venation and serration and by the form of the stipules. My reason for not formally proposing this new section is that I do not feel that Clarke's primary division of the genus into two sections *Rubriflorae* and *Viridiflorae* is a suitable basis for herbarium work, unless reinforced by other characters. The form of the stipules, which can often be ascertained from the scars left when they have fallen, is a character not used by Clarke, which seems likely to prove of value when used in conjunction with those of leaves and flowers.

Pentaspadon minutiflora B. L. Burt [Anacardiaceae]; species nova *P. Moskowskii* Lauterbach peraffinis sed ob flores minores et pedicellos tenues statim distinguenda.

Arbor ad 18–21 m. alta, ramulis breviter pubescentibus lenticellosis. *Folia* alterna, imparipinnata, petiolo ad 12 cm. longo brevissime pubescente vel glabrescente supra leviter applanato basin versus modice incrassato; foliola 4–5-iuga, petiolulis 2–3 mm. longis supra canaliculatis, lanceolata vel oblongo-lanceolata, apice sensim obtuse acuminata ad basin (terminali angustato excepto)

³ The morphological interpretation of this organ is uncertain and it has been variously described as disc, corona and staminal tube; the term disc is used here merely as a convenient one and does not necessarily indicate agreement with that interpretation.

rotundata, c. 8–12 cm. longa et 2–4 cm. lata, inferiora minora, subglabra, supra nitida, subtus opaca, marginibus integerrimis; nervi laterales c. 12–15 fere recte patentibus vel plus minusve ascendentes; rhachis ut petiolus pubescens, supra applanata vel leviter canaliculata; pars interiugalis c. 3 cm. longa. *Inflorescentiae* axillares, foliis aequilongae, permultiflorae, ramosae; axis, rami et pedicelli breviter pubescentes; pedicelli vix 1 mm. longi. *Calyx* 5-lobatus, vix 1 mm. longus, lobis tubo paullo longioribus obtusis irregulariter dentatis, glaber. *Petala* 5, libera, obovata, 1–5 mm. longa, 1 mm. lata, papillosa. *Stamina* fertilia 5, 0.5 mm. longa, filamentis crassis antheris paullo longioribus. *Staminodia* 5, staminibus fertilibus alternantia et dimidio breviora, apice glandulo instructo. *Discus* 10-lobatus, vix 0.25 mm. altus. *Ovarium* ovoideum, hirsutum uniloculare, uniovulatum, stylo crasso incluso 0.5 mm. altum, stigmatem leviter bilobo. *Fructus* ignotus.

SOLOMON ISLANDS. Bougainville Island, Siwai, "a large spreading tree, 60–70 ft., very handsome when in full blossom, near river bank," 2 Jan., 1932, *Waterhouse* B.666 (type); "Large handsome tree to 60–70 ft., spreading foliage; masses of small creamy white blossoms; from more open country and river banks." Feb. 1932, *Waterhouse* Y.13.

Vernacular names—*siinari* (Siwai); *vitawa* (Teop).

XXVII—NOTES ON AFRICAN GRASSES : XVIII.* C. E. HUBBARD.

Crinipes longifolius C. E. Hubbard, sp. nov.; affinis *C. abyssinico* Hochst. et *C. longipedi* C. E. Hubbard, comb. nov. (*Triraphidi longipedi* Stapf et C. E. Hubbard), ab illo foliorum laminis planis latioribus, panicula laxiore, ramis longioribus, glumis paullo brevioribus, lemmatis apice integro vel breviter bisetoso, aristis longioribus, ab hoc laminis longioribus et multo latioribus planis, panicula majore densiore, spiculis minoribus 2–3-floris distinguitur.

Gramen perenne, laxa caespitosum, 0.45–1.3 m. altum; innovationes extravaginales; gemmae cataphyllis coriaceis glabris obtectae. *Culmi* erecti, validiusculi, teretes, simplices, paucinodes, glabri laevesque. *Foliorum vaginæ* sparse pubescentes, demum glabrae, arcte appressae, inferiores internodiis multo longiores, superiores internodiis breviores; ligulae ad seriem ciliatorum sericeorum redactae; laminae lanceolato-lineares, basin versus longe attenuatae, apice setaceo-acutae, usque ad 80 cm. longae, 5–12 mm. latae, planae, firmae, virides, glabrae vel supra laxe pilosae, marginibus scaberulis exceptis laeves. *Panicula* laxiuscula, nutans, usque ad 30 cm. longa et 7 cm. lata; rhachis gracillima, laevis, superne flexuosa; rami fasciculati, filiformes, laeves, laxè divisi, inferiores

usque ad 16 cm. longi; pedicelli inaequales, 1–7 mm. longi. *Spiculae* oblongae, 5–6 mm. longae, 2–3-florae, flavido-virides vel purpureo-suffusae. *Glumae* 1-nerves, membranaceae, plerumque mucronatae, mucrone usque ad 1.5 mm. longo; inferior anguste lanceolata, 3–3.5 mm. longa; superior oblongo-lanceolata, 3.5–4 mm. longa. *Lemmata* oblongo-ovata (explanata), 3–4 mm. longa, apice integra vel obscure bidentata, dentis setiformibus usque ad 0.7 mm. longis, membranacea, 3-nerve, prope margines pilis circiter 1 mm. longis ciliata; arista stricta, 4–6 mm. longa, scaberula. *Paleae* anguste oblongae, usque ad 3.5 mm. longae, carinis apicem versus ciliatae. *Antherae* circiter 2 mm. longae. *Callus* pilis albis 1 mm. longis barbatus; anthoecii secundi et tertii callus 1–1.5 mm. longus.

UGANDA: Bugishu; Mt. Elgon, Bulago, on moist rock, 1860 m., August 1932, *Thomas* 296 (type); Butandiga, cliff-edge, 2100 m., Jan. 1918, *Dummer* 3642.

Coelachne Friesiorum C. E. Hubbard, sp. nov.; affinis *C. africanæ* Pilger, a qua spiculis paullo majoribus, panicula angusta plus minusve contracta, culmis brevioribus differt.

Gramen perenne (?). *Culmi* e basi procumbente ascendentes, e nodis radicales, 2.5–5 cm. alti, gracillimi, basin versus ramosi, plurinodes, glabri. *Foliorum vaginæ* laxae, tenuiter striatae, internodiis plerumque paullo longiores, nodis breviter pilosae, marginibus prope os pilis paucis nonnunquam praeditae; ligulae ad seriem ciliatorum brevissimorum redactae; laminae lanceolatae, basi angustatae, apice obtusae, 4–10 mm. longae, usque ad 3.5 mm. latae, planae, virides, glabrae, supra arcte nervosae, nervis asperulis. *Panicula* plus minusve contracta, 6–30 mm. longa; rhachis laevis; rami solitarii, 1–3-spiculati, usque ad 8 mm. longi, laeves; pedicelli laterales usque ad 1 mm. longi. *Spiculae* oblongae, 3 mm. longae, pallide virides et purpureo-suffusae. *Gluma* inferior late ovato-vel late elliptico-oblonga, obtusa, usque ad 1.5 mm. longa, obscure 2–3-nervis; gluma superior late elliptico-oblonga, obtusa, 1.5–1.8 mm. longa, tenuiter 5-nervis. *Anthoecium inferum*: lemma explanatum late ellipticum et obtusum, 2.4 mm. longum, marginibus basin versus pilis paucis exceptis glabrum, obscure 3–5-nerve; palea lanceolato-oblonga, obtusa; antherae 2, fere 1 mm. longae. *Rhachillae* internodium 1 mm. longum. *Anthoecium superum*: lemma explanatum ovato-ellipticum vel ellipticum, obtusum, 2 mm. longum, enerve vel obscure 3-nerve, prope margines et dorso basin versus breviter pubescens; palea oblonga, dorso et carinis breviter pubescens.

KENYA COLONY: Mt. Aberdare, near Sattima, in swamp, *Fries* 2407.

Poecilostachys Bakeri (Schinz) C. E. Hubbard, comb. nov. *P. bromoides* Stapf in Hook. Ic. Plant. sub t. 3071 (1916). *Oplismenus bromoides* Baker in Journ. Linn. Soc., Bot. 21, 452 (1885), non Beauv. *O. Bakeri* Schinz in Durand et Schinz, Consp. Fl. Afr. 5, 771 (1894).

Distrib.—Madagascar.

* Continued from K. B. 1934. Page 437

Tristachya purpurea C. E. Hubbard, sp. nov.; affinis *T. tristachyoidi* (Trin.) C. E. Hubbard, sed foliorum laminis anguste linearibus angustioribus, spiculis atropurpureis, gluma inferiore longiore differt.

Gramen perenne, usque ad 60 cm. altum. *Culmi* erecti, graciles, rigidi, simplices, 3-4-nodes, glabri laevesque. *Foliorum vaginæ* arcte appressæ, internodiis multo breviores, nodis minute pubescentes vel glabrae, inferiores basin versus tomentosae, superne glabrae, ceterae marginibus ciliatae vel glabrae, laeves; ligulae ad seriem ciliorum minutorum redactae; laminae anguste lineares, subacutae, inferiores usque ad 12 cm. longae, superiores 0.6-2.5 cm. longae, convolutae vel explanatae et usque ad 2.5 mm. latae, rigidae, glabrae vel basin versus pilis paucis praeditae, marginibus scaberulis exceptis laeves. *Panicula* laxa, ovata vel oblonga, 2.5-8 cm. longa, 2-12 triades spicularum gerens; rhachis gracilis, pilis rigidis patentibus albis e tuberculis ortis laxè setosa; rami gracillimi, plerumque simplices, ut rhachis setosi, infra apicem curvati, usque ad 2.5 cm. longi; pedicelli intus pubescentes, usque ad 1.5 mm. longi. *Spiculae* lanceolato-oblongae, 7-10 mm. longae, atropurpureae. *Glumae* trinerves; inferior lanceolata vel ovato-lanceolata, 7-8 mm. longa, chartacea, nervis pilis albis patentibus usque ad 4 mm. longis e tuberculis ortis laxè setosa; superior ovato-lanceolata, breviter biloba vel emarginata vel obtusa, mucronata, spiculae aequilonga, nervis lateralibus pilis rigidis brevibus e tuberculis ortis ciliata. *Anthoecium inferum* ♂: lemma glumae superiori simile sed glabrum; palea anguste oblonga, obtusa vel subacuta, 5 mm. longa. *Anthoecium superum* anguste oblongum: callus obtusus, 1 mm. longus; lemma 4-4.5 mm. longum, bilobum, lobis in setam capillarem scaberulam usque ad 7 mm. longam attenuatis, coriaceum, 5-7-nerve, pubescens, infra lobos pilis erectis 1-1.5 mm. longis dense barbatum; arista usque ad 2 cm. longa, columna lata complanata laxè torta 5-7 mm. longa intus minute pubescente extus laevi; palea 4.5-5 mm. longa. *Antherae* 3, 2-2.5 mm. longae. *Ovarium* glabrum.

FRENCH GUINEA: Timbo, very common in wet places on rocky plateau, *Pobéguin* 1756 (type), 1757*.

Tristachya multinodis C. E. Hubbard, sp. nov.; affinis *T. tristachyoidi* (Trin.) C. E. Hubbard, sed gluma inferiore glabra vel fere glabra, spiculis minoribus differt.

Gramen perenne (?). *Culmi* erecti, usque ad 75 cm. alti, graciles, simplices, usque 10-nodes, glabri laevesque. *Foliorum vaginæ* arcte appressæ, inferiores marginibus ciliolatae, superiores glabrae, laeves, internodiis multo breviores; ligulae ad seriem ciliorum minutorum redactae; laminae anguste lanceolatae, basi contractae, acutae, usque ad 9 cm. longae et 9 mm. latae, planae vel siccitate marginibus involutae, rigidae, horizontaliter patentes, fere glabrae, laeves. *Panicula* contracta, 10 cm. longa, usque 34 triades spicularum gerens; rhachis gracilis, scaberula; rami erecti, tenuiter

filiformes, scabridi, simplices vel laxè divisi, apicem versus pilis rigidis albis e tuberculis ortis praediti, inferiores usque ad 5 cm. longi; pedicelli glabri, 1-2 mm. longi. *Spiculae* lanceolatae vel anguste oblongae, 6-6.5 mm. longae, pallide stramineae. *Glumae* tenuiter chartaceae, trinerves; inferior anguste ovata, acuta, 3.5-4 mm. longa, plerumque glabra, nervis scaberula; superior late lanceolata vel oblongo-lanceolata, acuta, spiculae aequilonga, glabra. *Anthoecium inferum* ♂: lemma oblongo-lanceolatum, acutum, spiculae aequilongum, trinerve, glabra; palea anguste oblonga, 3 mm. longa, carinis superne ciliolata. *Anthoecium superum* anguste oblongum: callus truncatus, 0.6 mm. longus; lemma 3 mm. longum, 2-lobum, lobis in setam capillarem scaberulam usque ad 5 mm. longam attenuatis, tenuiter coriaceum, 5-nerve, breviter pubescens, infra lobos pilis brevibus albis dense barbatum; arista usque ad 1.8 cm. longa, columna scaberula usque ad 4 mm. longa; palea 4 mm. longa. *Antherae* 3, 1-1.5 mm. longae. *Ovarium* glabrum.

SIERRA LEONE: without precise locality, *Lane-Poole* 418.

Tristachya tristachyoides (Trin.) C. E. Hubbard, comb. nov. *T. microstachya* Nees ex Steud. Syn. Pl. Glum. 1, 238 (1854). *T. tuberculata* Stapf in Kew Bull. 1897, 294. *Panicum tristachyoides* Trin. in Bull. Sci. Acad. Petersb. 1, 71 (1836).

Distrib.—Senegambia and Sierra Leone.

Panicum tristachyoides Trin. was based on an old specimen from which the fertile florets had fallen. The type in the Leningrad Herbarium consists of one piece of culm and inflorescence. The type of *Tristachya microstachya* Nees is in the Cambridge Herbarium. The locality on the sheet is "S. Leone." Steudel unfortunately mistook this for "Lima" and cited the locality as such, with the result that the species has been usually regarded as Peruvian.

Loudetia Hitchcockii C. E. Hubbard, sp. nov.; affinis *L. lualabaënsi* (De Wild.) C. E. Hubbard, comb. nov. (*Trichopterygi lualabaënsi* De Wild.), sed culmis 6-8-nodibus validioribus teretibus, spiculis et aristis longioribus differt.

Gramen perenne, e rhizomate brevi ortum, usque ad 1.7 m. altum. *Culmi* erecti, validiusculi, teretes, lignosi, glauci, simplices vel infra medium ramosi, 6-8-nodes, glabri laevesque. *Foliorum vaginæ* latae, demum laxae, plerumque internodiis breviores, glabrae laevesque; ligulae ad seriem ciliorum redactae; laminae lineares, in acumen tenue attenuatae, usque ad 30 cm. longae, 4-6 mm. latae, planae, supra scaberulae, subtus laeves, marginibus scabridae. *Panicula* angusta, plus minusve contracta, usque ad 23 cm. longa et 2.5 cm. lata; rhachis inferne laevis, superne scaberula, nodis inferioribus plerumque breviter pilosa; rami erecti, scaberuli, apicem versus 3-1-spiculati, inferiores 2-3-nati, usque ad 5 cm. longi; pedicelli inaequales, usque ad 10 mm. longi. *Spiculae* lanceolatae et acuminatae vel demum anguste oblongae et hiantes,

13–20 mm. longae, flavido-virides, demum flavido-brunneae. *Glumae* chartaceae, 3-nerves, glabrae; inferior anguste ovata vel ovato-oblonga, acuta vel obtusa, spiculae aequilonga. *Anthoecium inferum* ♂: lemma glumae superiori subsimile, sed acutum vel obtusum, 5–7-nerve; palea linearis, 11–15 mm. longa, carinis apicem versus ciliolata. *Anthoecium superum* lineare: callus pungens, 2 mm. longus, pilis longis brunneis dense barbatus; lemma usque ad 13 mm. longum, bilobum, lobis tenuiter acutis 3–4 mm. longis, coriaceum, 7–9-nerve, pubescens; arista plerumque bigeniculata, usque ad 4 cm. longa, columna scaberula usque ad 2 cm. longa; palea 9–11 mm. longa. *Antherae* 3, 4–8 mm. longae.

NORTHERN RHODESIA: Kazungula Quarantine Area, 1050 m., swamp grass, *Trapnell* 960; Barotse Plain, 1060 m., *Trapnell* 1341.

SOUTHERN RHODESIA: Victoria Falls, *Hitchcock* 24193, 24229 (type).

Danthoniopsis viridis (*Rendle*) C. E. Hubbard, comb. nov. *Trichopteryx viridis* Rendle in Cat. Afr. Pl. Welw. 2, 216 (1899). *Danthoniopsis Gossweileri* Stapf in Hook. Ic. Plant. 31, t. 3075 (1916).

Distrib.—Angola.

Danthoniopsis wasaënsis (*Vanderyst*) C. E. Hubbard, comb. nov. *Trichopteryx wasaënsis* Vanderyst in Bull. Agric. Congo Belge, 11, 112 (1920).—Species *Danthoniopsis minori* Stapf et C. E. Hubbard affinis, sed culmis altioribus inferne glabris, nodis longe barbatis, panícula latiore usque ad 6.3 cm. lata, spiculis majoribus 8–10 mm. longis, gluma inferiore anguste ovata vel ovato-oblonga acuta, aristis longioribus 11–14 mm. longis differt.

BELGIAN CONGO: between Wasa and Gana, *Vanderyst* 5635.

Danthoniopsis pruinosa C. E. Hubbard var. **gracilis** C. E. Hubbard, var. nov.; a typo differt culmis caespitosis 70 cm. altis gracilioribus simplicibus vel inferne ramosis epruinosis, internodiis inferioribus pilosis, foliorum laminis usque ad 12 cm. longis et 5 mm. latis.

NORTHERN RHODESIA: Musha Hills, near Kanona, 1680 m., *St. Clair-Thompson* 1292.

Deschampsia caespitosa (L.) Beauv. var. **Oliveri** C. E. Hubbard, var. nov. Culmi circiter 75 cm. alti; foliorum laminae anguste lineares, pungentes, usque ad 30 cm. longae, conduplicatae vel explanatae et usque ad 3 mm. latae, rigidae, subtus asperulae, supra scabridae; panícula 20–25 cm. longa, laxa, flexuosa; spiculae 5–6 mm. longae; lemmata dorso aristam 2.5–4 mm. longam circiter medio vel supra gerentia.

UGANDA: Mt. Ruwenzori, 3000 m., *Oliver* 23, 24; Kigo Flats, 3300 m., *Fishlock and Hancock* 139 (type).

Deschampsia caespitosa (L.) Beauv. var. **Mannii** C. E. Hubbard, var. nov. Culmi 60–105 cm. alti; foliorum laminae usque ad 60 cm. longae, 4–5 mm. latae, planae, subtus asperulae, supra scaberrimae; panícula 32–42 cm. longa, laxa; spiculae pallidae, 4–5 mm. longae; lemmata 3–3.5 mm. longa, basin versus aristata; arista 3–4 mm. longa.

FERNANDO PO: Clarence Peak, 2700–3000 m., *Mann* 322 (type), 1464.

XXIX—CONTRIBUTIONS TO THE FLORA OF TROPICAL AMERICA: XXIV.* N. Y. SANDWITH.

REVIEW OF THE SPECIES OF BYRSONIMA OCCURRING IN BRITISH GUIANA.

The working out of a new species of *Byrsonima* necessitated a rearrangement of the whole of the Kew material of this genus in accordance with Niedenzu's Monograph in Engler, Pflanzenreich, iv. 141, pars ii (1928). Special attention was paid to the representatives of the genus occurring in British Guiana, with the result that a key was drawn up for distinguishing the twelve species found in the Kew material. This key, which follows these remarks, is designed for the use of both field workers and herbarium botanists, and assumes that notes on colour of flowers and height of plant will always be present on the labels of the intelligent collectors of the future. The treatment departs from or supplements that of Niedenzu's monograph of the genus in the following noteworthy respects:

1. Niedenzu's genus *Alcoceratothrix* is not regarded as worthy of generic segregation, and *A. rugosa* (Benth.) Ndz. is restored to its original position in *Byrsonima*.

2. *B. ceranthera* Benth. is reduced to *B. gymnocalycina* Juss., the only discrepancy between the type collections being the presence or absence of glands on the calyx.

3. *B. sessilifolia* Benth., based on *Robert Schomburgk*, 1st coll. without number, is reduced to *B. coccolobifolia* H.B.K. Niedenzu neither saw nor cited the type specimen of *B. sessilifolia* at Kew, which does not in the least resemble his own Brazilian varieties α *minarum* and β *cearensis*.

4. *B. Aerugo* Sagot, which Niedenzu placed at the head of his "species incertae," is upheld, on the evidence of Sagot's description and specimens, as apparently the earliest specific name for the rain-forest tree with yellow flowers, leaves rusty beneath, and relatively long and narrow bracts which are conspicuously curled downwards on the rhachis. Specimens of this have been passing for nearly a century under the name *B. altissima* (Aubl.) H.B.K.—

* Continued from K.B. 1935, 132.

a combination more correctly cited as *B. altissima* (Aubl.) DC. Prodr. 1, 579 (1824) since it was not validly made by Kunth who merely placed the species in a list of *Malpighiae* referable to the genus *Byrsonima*, see Nov. Gen. et Sp. Pl. 5, 147 (1821)—and no one in recent years seems to have questioned the identification. *B. altissima* DC. was based on *Malpighia altissima* Aubl. Hist. Pl. Guiane, 455, t. 181, de Candolle giving a very short description adapted from Aublet, and omitting the sign (v.s.) which would have indicated that he had seen dried material. Aublet described the flowers of his 60–80 ft. tree as white, and remarked that the peduncles were furnished at the base with “deux petites écailles.” These may or may not refer to the bracteoles alone, as distinct from the bract; in any case, all that can be seen in Aublet’s figure at the base of each pedicel is a short and relatively broad organ which is arcuate-ascending. Now there is an Aublet specimen in the British Museum Herbarium which has been written up as *Malpighia altissima* Aubl. and labelled “Type specimen” and which certainly agrees well with his description and figure. The leaves of this specimen are very similar in general characters to those of the tree which is now called *B. altissima*, but a glance at the raceme immediately upsets this identification. The bracts, instead of being long, narrow and recurved, are very short, ovate and spreading, and this is not due to mutilation or age, since the raceme is young with unexpanded buds at the apex. When Jussieu wrote his Monograph of the Malpighiaceae in 1843, he had seen this Aublet specimen and regarded *B. altissima* as doubtfully distinct from the variable *B. crassifolia*. He also considered that *B. ferruginea* H.B.K. was another species scarcely differing from *B. crassifolia*. Now *B. ferruginea* is a name which has been frequently given to collections of *B. Aerugo* (*B. altissima* auct.). Thus, Schomburgk 811 (1408) was described by Benth in 1848 as *B. ferruginea* var. *macrophylla*, see Hook. Lond. Journ. Bot. 7, 119. The same collection was referred by Grisebach (Linnaea, 22, 5: 1849) to *B. altissima*; and finally and correctly by Sagot (Ann. Sci. Nat. sér. 6, 12, 178: 1881) to his *B. Aerugo*. Sagot noted that specimens of his new species in Herb. Paris. had been identified as both *B. ferruginea* var. and as *B. Hostmanni* Bth.; in fact, his no. 102 was distributed under the latter name. *B. ferruginea* H.B.K., from the evidence of the description and figure, is a species with small ascending bracts only 1 line long, which cannot possibly be identified with *B. Aerugo* and is perhaps correctly referred to *B. crassifolia*; while *B. Hostmanni* Benth. should now be reduced to *B. coriacea* var. *spicata*. In other words, Sagot, who had at his command the wonderfully rich material of the Paris Herbarium, with all the types of Jussieu, Poiret and H.B.K., was apparently fully justified in describing *B. Aerugo* as a new species. Unfortunately, this never became clear to Niedenzu, who accepted Grisebach’s misinterpretation of *B. altissima* and failed to find a place in his Monograph for *B. Aerugo*.

As to *B. altissima* (Aubl.) DC., whatever it may be, no material corresponding with the authentic specimen has yet been seen from British Guiana. Sagot wrote of it as a large tree collected by Aublet alone, and repeated Jussieu’s statement about its close affinity with *B. crassifolia*, and the matter may be left there for the present.

The following is a list of the collections seen of *B. Aerugo* Sagot, including Niedenzu’s varieties *orientalis* (French Guiana) and *occidentalis* (British Guiana) of his *B. altissima*, which do not seem worthy of distinction:

FRENCH GUIANA. Karouany, Sagot 102. Maroni, ann. 1862, Mélinon; Wachenheim 95.

BRITISH GUIANA. Pomeroon River, Robert Schomburgk 811 (2nd. coll.) and Richard Schomburgk 1408. Tapacooma Creek, Jenman 6617. Demerara River, Jenman 5100. Moraballi Creek, Essequibo River, Sandwith 339, 375. Kaieteur Falls, Potaro River, la Cruz 4389.

5. *B. bracteolaris* Benth. was another species which was not seen by Niedenzu owing to his failure to visit or to borrow specimens from London or Paris. The type specimen has been carefully examined and the recent collections of Tate on Mount Duida, Venezuela, which were correctly referred to this species by Dr. H. A. Gleason, have been kindly lent for study by the authorities of the New York Botanical Garden. There can be no doubt at all that this species is extremely closely related to *B. concinna* Benth. The character of the indumentum of the rhachis and sepals of the inflorescence of *B. bracteolaris* is of no value, since the rhachis of *B. concinna* is by no means glabrous, and in Ule 8623 from the Rio Cuquenán—a collection which is obviously referable to *B. concinna* though Niedenzu cited it under *B. ligustrifolia* var. *glabra*—the sepals are rusty-pubescent on the back as in *B. bracteolaris*. The proportion of the length of the produced part of the connective to that of the loculi of the anthers of *B. bracteolaris* was either exaggerated by Benth or was taken from one or two anthers only, and will not work when compared with that of the similar parts of *B. concinna*. The two species are so alike in general facies, as well as in their area of distribution, that one is strongly tempted to unite them under the name *bracteolaris*. Against this, however, is the evidence of the unusually small loculi of the anthers of *B. bracteolaris*, both in the type specimen and in the Tate collections from Mount Duida. Further collections of both species may produce other distinctions, or may show conclusively that they must be united.

6. *B. sericea* DC. var. *typica* Ndz. is recorded by Niedenzu from British Guiana on the strength of Schomburgk 144. No such specimen has been found in London and a request for the loan from Berlin has failed to produce it, so some error may be presumed. No British Guiana specimens have yet been seen which can be referred to this species.

Of the twelve species occurring in the Colony, two, *B. rugosa* and *B. Aerugo*, are plentiful in the coastal forests where they often occur as quite large trees with edible berries and are known by the Arawak name "Arakadako." *B. gymnocalycina* is frequent on the banks of the large rivers, and is an attractive small tree. The remaining species are characteristic shrubs and small trees of the savannah districts, and of low secondary growth on a sandy soil, or are confined to the sandstone mountains of the interior. *B. coccolobifolia* and *B. verbascifolia* are two widely distributed species of the savannahs of South America and the West Indies. *B. coriacea* var. *spicata* (Niedenzu's treatment is accepted here, since he has seen the type of *B. coriacea*) and *B. crassifolia* are common and extremely variable plants and apparently hybridise (see *Jenman* 2159 in *New York Bot. Gard. Herb.*); the named varieties are connected by intermediates and are of doubtful taxonomic value. *B. Schomburgkiana* is a local species of the Rupununi and Rio Branco savannahs, while *B. concinna* and *B. bracteolaris* occur at high altitudes on Roraima and other parts of the Pacaraima Range. *B. chalcophylla* is a rare and interesting endemic of Roraima at present known from only two collections, *Ule* 8624 and *im Thurn* (Set A at Kew) no. 130; the latter specimen was gathered at 5750 ft., but *Ule*'s was noted as occurring in "im unteren Walde."

KEY TO THE SPECIES OF BYRSONIMA KNOWN
FROM BRITISH GUIANA.

- Leaves velvety, densely greyish-woolly, large, obovate, arising from the apex of thick woody branchlets; petals yellow to orange; a low gnarled shrub of savannahs.....**verbascifolia** (L.) Rich.
- Leaves not as above :
 - Leaves with raised and forked hairs beneath; stipules large and conspicuous, more than 1 cm. long and 5 mm. wide; petals yellow; fair-sized or tall tree.....**rugosa** Benth. (*coleostachya* Griseb.)
 - Leaves without raised and forked hairs beneath; stipules small and inconspicuous :
 - Anther loculi conspicuously horned; leaves drying a dark lead colour above and reddish beneath; petals white or pink; a small riverside tree.....**gymnocalycina** Juss. (*ceranthera* Benth.)
 - Anther loculi not horned :
 - Mature leaves glabrous; petals white to deep rose; shrubs :
 - Leaves sessile, rounded and more or less cordate at the base, obtuse, rounded or emarginate at the apex.....**coccolobifolia** H.B.K. (*sessilifolia* Benth.)
 - Leaves distinctly petiolate, attenuate and cuneate at the base :
 - Leaves commonly exceeding 9 cm. in length, very shortly and acutely cuspidate; bracts linear or linear-lanceolate.....**Schomburgkiana** Benth.

Leaves usually less than 9 cm. long, very shortly and obtusely cuspidate, or shortly acuminate, or obtuse; bracts ovate or ovate-lanceolate :

Leaves oblong-lanceolate, normally acuminate, glaucescent beneath; loculi of anthers 2 mm. long or longer **eugeniifolia** Sandwith

Leaves obovate or oblanceolate, not acuminate, not glaucescent beneath :

Loculi of anthers 1.2-1.5 mm. long.....**concinna** Benth.

Loculi of anthers very short, about 1 mm. long or less, hardly up to 1.2 mm.....**bracteolaris** Benth.

Mature leaves not glabrous or, if nearly so, then petals yellow; petals bright yellow except in *B. chalcophylla*; shrubs to large trees :

Bracts conspicuously curled backwards; often a large tree, the leaves reddish-rusty beneath.....**Aerugo** Sagot (*altissima* auct., non (Aubl.) DC.)

Bracts not conspicuously curled backwards; usually shrubs or small trees :

Leaves with a persistent reddish-rusty tomentum on the lower surface; bracts more than 3 mm. long; petals pink; fruit more than 1 cm. long.....**chalcophylla** Ndz.

Leaves without the persistent tomentum of *B. chalcophylla*; bracts less than 3 mm. long; petals yellow; fruit less than 1 cm. long :

Leaves lanceolate, oblong-lanceolate or elliptic-lanceolate, acuminate; parallel lateral nerves very numerous, more than 15; ultimate veinlets of mature leaves impressed on both surfaces but forming a very fine dark reticulation on the lower**coriacea** (Sw.) DC. var. **spicata** (Cav.) Rich.

Leaves elliptic to obovate, obtuse, shortly cuspidate, or acute, rarely lanceolate and acuminate; parallel lateral nerves 15 or fewer; ultimate veinlets of mature leaves normally prominulous on both surfaces.....**crassifolia** (L.) H. B.K.

Byrsonima eugeniifolia Sandwith sp. nov.; *B. concinna* Benth. atque *B. bracteolari* Bth. affinis, foliis oblongo-lanceolatis acuminatis subtus glaucis vel glaucescentibus, nervis lateralibus rectius atque magis horizontaliter patentibus, antherarum loculis longioribus differt.

Frutex vel arbor parva, ramulis summis subteretibus tenuiter striatis plus minusve cinereis arcte adpresse pubescentibus; internodia 1-5 cm. longa. *Stipulae* ovatae, obtusae, 2.5-3.5 mm.

longae, basi connatae, indumento ramulorum. *Folia* parva, angusta, oblongo-lanceolata, siccitate saepe conduplicata, apice breviter acuminata vel saltem sensim attenuata, basi cuneata lamina in petiolum decurrente, 3.5-7.5 cm. longa, 1.2-2.8 cm. lata, adulta coriacea, supra plus minusve nitidula, subtus siccitate etiam distincte glaucescentia et densissime lepidoto-punctulata, utrinque glaberrima, nervis lateralibus more generis *Eugeniae* valde numerosis subrectis atque subhorizontaliter patentibus utrinque tenuiter prominulis, primariis a ceteris plerumque vix distinguendis ut videtur 8-10 prope marginem arcuatim anastomosantibus, rete venularum utrinque praesertim supra conspicuo; petiolus adpresse pubescens, 4-7 mm. longus. *Inflorescentiae* simpliciter racemosae, 3-10 cm. longae, statu vivo intense rubrae; rhachis angulata atque sulcata, interdum subapplanata, dense cinereo-vel ferrugineo-pubescens; bracteae ovato-lanceolatae vel ovatae, obtusae, etiam siccitate rubrae vel nigro-purpurascens, extra semper plus minusve pubescentes, infimis subfoliaceis exceptis 2.5-4 mm. longae, 1.5-2.5 mm. latae; bracteolae similes sed minores; pedicelli flavo-vel ferrugineo-pubescens, 6-10 mm. longi. *Sepala* glandulas intense carneas obovoideas 1.5-2 mm. longas gerentia; lamina ovato-oblonga, obtusa, apice demum recurva, 3 mm. longa, 2-2.2 mm. lata, ciliata, utrinque prope medium plus minusve pubescens necnon interdum subsericea. *Petala* lamina alba carneo-suffusa, reniformi-cordata, 4.5 mm. longa, 5.5-6.5 mm. lata; unguis 3.5-3.75 mm. longus. *Torus* pilosus. *Stamina* filamentis 2.2-2.75 mm. longis, basi excepta glabris; antherae lineari-oblongae, glabrae, loculis 2-2.2 mm. longis apice connectivo subclavato paullum (ad 0.25 mm.) superatis. *Ovarium* glabrum, 1.5-1.75 mm. diametro; styli intense carnei, 3.5-3.75 mm. longi. *Fructus* (in *Jenman* 3651) ovoideo-subglobosus, 3-3.5 mm. diametro (forsan vix maturus).

BRITISH GUIANA. In scrub savannah on white sand soil, Captain Creek, Mahaicony River, Demerara Co., April 1934, *Davis* in *Forest Dept.* no. 2387 (type): shrub with leaves glaucous below; inflorescence dark reddish; petals white flushed with pink; glands and styles deep pink; anthers black. Kaieteur Savannah, Potaro River, Feb. 1879, *im Thurn*. *Ibid.*, Sept.—Oct. 1881, *Jenman* 1024: shrub or small tree, 6-10 or more feet high. Without locality, April 1887, *Jenman* 3651.

XXX—SOME CHANGES IN PLANT-NAMES. I. H. BURKILL.

I have been asked to publish in a taxonomic journal such new names as will appear in my "Dictionary of the Economic Products of the Malay Peninsula." They are as follows:—

1. I recognise *Acroceras* Stapf (in Prain, *Fl. Trop. Afr.* 9, 621: 1920) as distinct from *Panicum* Linn. Hence *Panicum Ridleyi*

Hackel ex Ridley (in *Trans. Linn. Soc. ser. 2, Bot.* 3, 400: 1893) published as a *nomen nudum*—(syns. *P. crassipiculatum* Merrill in Philipp. Journ. Sci. 1, suppl. p. 356: 1906, and *Acroceras Ridleyi* Stapf ex Ridley, *Flora Mal. Penins.* 5, 229: 1925) becomes ***Acroceras crassipiculatum*** comb. nov.

2. By the conservation of the name *Alyxia* Banks (ex R. Brown, *Prodr. Flor. Nov. Holl.* 469: 1810) against *Gynopogon* Forster (*Char. Gen. Plant.* 35: 1776), *G. breviflorum* Kurz, *For. Flora Brit. Burma*, 2, 177 (1877), requires a new name: but *A. breviflora* is not available for it, as Huerck and J. Mueller of Argau used that combination for another plant: it is suggested, therefore, that *G. breviflorum* Kurz be called ***Alyxia Kurzii*** nom. nov.

3. On restoring *Ceiba pentandra* var. *caribaea* Backer ex Bakhuisen van den Brink in *Bull. Jard. bot. Buitenzorg*, ser. 3, 6, 196 (1924), to specific rank it becomes ***Ceiba occidentalis*** comb. nov., based on its oldest name, *Bombax occidentale* Sprengel, *Syst. Veg.* 3, 124 (1826).

4. By the reduction of *Tanacetum* Linn. and *Pyrethrum* Linn. to *Chrysanthemum* Linn., *T. umbelliferarum* Boissier, *Diagn. Plant. Or. Nov.*, ser. 2, no. 3, 30 (1856), with the synonym *P. umbelliferarum* Boissier, *Flora Orient.* 3, 352 (1875), becomes ***Chrysanthemum umbelliferarum*** comb. nov.

5. As *Corymborchis* Thouars (in *Nouv. Bull. Soc. Philom.* no. 19, 318: 1809) antedates *Corymbis* Thouars (*Orch. Isles Afr.* t. 37: 1822), *Corymbis longiflora*, Hooker fil., *Flora Brit. Ind.* 6, 92 (1890), becomes ***Corymborchis longiflora*** comb. nov.

6. Recognising *Ervatamia* Stapf (in Dyer, *Flora Trop. Afr.* 4, 126 (1902) as distinct from *Tabernaemontana* Linn., *T. dichotoma* Roxburgh, *Hort. Beng.* 20 (1814) and *Flora Ind.* 2, 21 (1832), becomes ***Ervatamia dichotoma*** comb. nov.

7. For the same reason *Tabernaemontana sphaerocarpa* Blume, *Bijdr.* 1028 (1826) becomes ***Ervatamia sphaerocarpa*** comb. nov.

8. Recognising *Firmiana*, Marsigli (in Saggi, *Padov.* 1, 106: 1786) as distinct from *Sterculia* Linn., *S. lychnophora* Hance in *Journ. Bot.* 14, 243 (1876), becomes ***Firmiana lychnophora*** comb. nov.

9. As *Fissistigma* Griffith (*Notul.* 2, 706: 1854), antedates *Melodorum* Hooker fil. and Thomson, (*Flora Ind.* 1, 115: 1855), *M. Kingii* Boerlage in *Ic. Bogor.* 1, fasc. 2, 134 (1899), becomes ***Fissistigma Kingii*** comb. nov.

10. As the oldest name for *Isoptera borneensis* Scheffer ex Burck, *Minjak Tengawang*, 27 (1886), is *Hopea seminis* de Vriese, *Minjak Tangkawang*, 32 (1861), the correct name is ***Isoptera seminis*** comb. nov.

11. Within the genus *Karatas* Miller (*Gard. Dict.* ed. 6: 1752), *Bromelia serra* Grisebach in *Goett. Abh.* 24, 328 (1879), with the synonym *B. argentina* Baker in *Kew Bull.* 1892, 194, requires a place under the name ***Karatas serra*** comb. nov.

12. Recognising *Languas* Koenig (in Retz, *Obs.* 3, 64: 1783) as distinct from *Alpinia* Linn., *A. Allughas* Roscoe in *Trans. Linn. Soc.* 8, 346 (1807) becomes ***Languas Allughas*** comb. nov.

13. Also, *Alpinia cannaefolia* Ridley in Journ. Roy. As. Soc. Straits branch, **32**, 174 (1899), becomes **Languas cannifolia** comb. nov.
14. Also, *Alpinia elegans* K. Schumann in Engl. Jahrb. **27**, 288 (1889), becomes **Languas elegans** comb. nov.
15. Also, *Alpinia javanica* Blume, Enum. plant. Jav. 59 (1827) becomes **Languas javanica** comb. nov.
16. Also, *Alpinia melanocarpa* Ridley in Journ. Roy. As. Soc. Straits branch, **32**, 163 (1899) becomes **Languas melanocarpa** comb. nov.
17. Also, *Alpinia padacanica* Valetton ex K. Heyne, Nutt. plant. Ned. Ind. ed. of 1922, 530, becomes **Languas padacanica** comb. nov.
18. Also, *Alpinia Rafflesiana* Wallich, Cat. lith. no. 6575 (1832) becomes **Languas Rafflesiana** comb. nov.
19. Also, *Alpinia regia* Valetton ex K. Heyne, Nutt. plant. Ned. Ind. ed. of 1922, 531 becomes **Languas regia** comb. nov.
20. Also, *Alpinia uviformis* Horaninow, Prod. Scit. 35 (1862) becomes **Languas uviformis** comb. nov.
21. As *Convolvulus crispatus* Wallich, Cat. lith. no. 1403 (1828) had not been validated by a description when Choisy in Mém. Soc. Genève, **31**, 457 (1834) described this species under the name *Ipomoea petaloidea*, if transferred to the genus *Merremia*, instead of the name *M. crispata* Prain, Bengal plants, **2**, 730 (1903) it should bear the name **Merremia petaloidea** comb. nov.
22. On reducing the genus *Gomphia* Schreber (Gen. **1**, 291 : 1789) to *Ouratea* Aublet (Plant. Guian. **1**, 397 : 1775), *G. Hookeri* Planchon in Hooker's Lond. Journ. Bot. **6**, 3 (1847) becomes **Ouratea Hookeri** comb. nov.
23. On account of the same reduction, *Gomphia sumatrana* Wallich in Cat. lith. no. 2803 (1829) ; Hooker fil., Flora Brit. Ind. **1**, 525 (1872) ; King in Journ. As. Soc. Bengal, **62**, pt. 2, 232 (1893) non Jack in Mal. Misc. no. 5, 29 (syn. *Gomphia oblongifolia* Ridley in Kew Bull. 1925, 281) requires a new name which cannot be *Ouratea oblongifolia* because that combination has been applied by Rusby to another species. Inasmuch as Griffith described this *Ouratea* as *Ochna crocea*, it should be called **Ouratea crocea** comb. nov.
24. By reducing the genus *Pasania* Oersted (in Kjoeb. Vidensk. Meddel. 1866, 81) to *Quercus* Linn., *Pasania lampadaria* Gamble in Kew Bull. 1914, 177, becomes **Quercus lampadaria** comb. nov.
25. By the same reduction *Pasania Maingayi* Schottky in Engl. Jahrb. **47**, 627 (1912), becomes **Quercus Maingayi** comb. nov.
26. As *Phaeomeria* Lindley (Introd. Nat. Syst. ed. 2, 446 : 1836) antedates *Nicolaia* Horaninow (Prod. Scit. 1862, 32), *N. Heyneana* Valetton in Bull. Jard. bot. Buitenzorg ser. 3, **3**, 128 (1921) becomes **Phaeomeria Heyneana** comb. nov.
27. By restricting the genus *Sideroxylon* Linn. as Dubard does

(in Comptes-rend. Acad. Sci. Paris, **152**, 392 : 1911), *S. Pohlmannianum* Benthams and Hooker fil. ex F. Mueller, Census, 91 (1882) becomes **Planchonella Pohlmanniana** comb. nov.

28. As *Polychroa* Loureiro (Flora Cochinch. 559 : 1790) antedates *Pellionia* Gaudichaud (in Freycinet, Voyage Bot. 494 : 1826), *Pellionia javanica* Weddell in Arch. Mus. Paris, **8**, 280 (1855-56) becomes **Polychroa javanica** comb. nov.

29. By the reduction of the genus *Kibessia* De Candolle, Prodr. **3**, 196 (1828) to *Pternandra* Jack in Mal. Misc. **2**, append. p. 3 (1822), *K. azurea* De Candolle, loc. cit., becomes **Pternandra azurea** comb. nov.

30. As *Rinorea* Aublet (Plant. Guian. **1**, 235 : 1775, antedates *Alsodeia* Thouars (Hist. Veg. Afr. **2**, 55 : 1807), *A. Hookeriana* King in Journ. As. Soc. Beng. **58**, pt. 2, 402 (1889), becomes **Rinorea Hookeriana** comb. nov.

31. As *Trichosporum* D. Don (in Edinb. Phil. Journ. July 1822) antedates *Aeschynanthus* Jack (in Trans. Linn. Soc. **14**, 42 : 1823), *A. lamponga* Miquel, Flora Ind. Bat. Suppl. 238 and 563 (1860), becomes **Trichosporum lampongum** comb. nov.

32. Because *Cissus simplex* Blanco, Flora Filip. 72 (1836), antedates *C. pyrrhodasys* Miquel, Flora Ind. Bat. Suppl. **1**, 517 (1860), when this species is transferred to the genus *Vitis*, it does not become *V. pyrrhodasys* Ridley, Flora Mal. Penins. **1**, 476 (1922) but **Vitis simplex** comb. nov.

33. When the genera *Padbruggea* Miquel (Flora Ind. Bat. **1**, pt. 1, 150 : 1855) and *Whitfordiodendron* Elmer (Leaflets Philipp. Bot. **2**, 689 : 1910) are maintained separate, *Padbruggea pubescens* Craib in Kew Bull. 1927, 61, becomes **Whitfordiodendron pubescens** comb. nov.

XXXI—PLANTS NEW TO ASSAM : VII*. C. E. C. FISCHER.

The previously known distribution, if any, is given between the name of the plant and its locality in Assam.

Vernonia talaumifolia Hook. f. et T. var. **hirsutior** C. E. C. Fischer, var. nov. [Compositae] ; a typo foliis subtus pubescentioribus, rhachidibus ramulisque panicularum pedunculique dense tomentosis, involucre majore, bracteis externe sericeo-villosis, pappo brevioris siccitate albo, acheniis minoribus pubescentibus recedit.

Type from Sikkim, Bhotan, Assam, Mishmi Hills.

Garro Hills ; Chitlang, 4000 ft., frt. Nov. Mrs. N. E. Parry 966, (type in Herb. Kew). Garro name *Dogamsi* : a shrub.

This specimen was noted by Miss Kosters as "related to *V. talaumifolia* Hook. f. & T. but involucre larger and achene pubescent."

* Continued from K.B. 1934, 94.

In the type the leaves are at most pubescent on the nerves beneath and not on the rest of the face as in this variety; the panicles and peduncles are hardly tomentose, here they are felted; the involucral bracts are little hairy and the achenes quite glabrous. A striking contrasting feature in the dry state is the reddish-brown pappus of the type.

Veronica cana Wall. [Scrophulariaceae].

Chumba to Sikkim, China.

Delei Valley, 28° 15' N : 96° 35' E, 6000 ft.; fls. pale, almost white, or faintly flushed with violet with very faint violet lines, mauve in bud, April, *F. Kingdon Ward* 8102, "on shady banks near streams in the temperate rain forest."

Veronica capitata Benth. [Scrophulariaceae].

Kunawar to Bhutan, W. China.

Delei Valley, 28° 21' N : 96° 37' E, 11,000 ft., fls. mauve, June, *F. Kingdon Ward* 8391, "on mud slides, rocks and earth-banks in gullies facing N."

Pinguicula alpina Linn. [Lentibulariaceae].

Europe, N.E. Asia, Himalayas in Kumaon and Sikkim.

Delei Valley, 27° 21' N : 96° 37' E, 10,000–11,000 ft., fls. white with a yellow spot in the throat, May, *F. Kingdon Ward* 8231. "on wet gneiss cliffs."

Aeschynanthus deleiensis C. E. C. Fischer, sp. nov. [Gesneriaceae]; ab *Ae. grandiflora* Spr. foliis minoribus, floribus solitariis, pedicellis bracteis calicibusque glanduloso-hirtis differt.

A slender *epiphyte*: branchlets pale-brown, glabrous, when dry longitudinally wrinkled and transversely rugulose. *Leaves* very coriaceous, broadly lanceolate, subcaudately bluntly acuminate, rarely merely narrowed to a blunt point, base acute, 3.2–6 cm. long, 1.5–2.6 cm. wide, quite glabrous, midrib rather wide, not prominent, nerves invisible, margins narrowly cartilaginous, slightly revolute when dry; petioles 0.5–1 cm. long. *Flowers* solitary, axillary; pedicels slender, 0.7–1.5 cm. long, subtended by 3–4 linear-ensiform bracts 1 mm. long, pedicels, bracts, calyx and corolla on the outside more or less densely furnished with slender multicellular, mostly gland-tipped hairs. *Calyx* 1.8 cm. long; tube narrowly campanulate, 1 cm. long; lobes linear-ensiform, acute or subacute. *Corolla* tubular-ventricose, 4.5–5 cm. long, mouth oblique; lobes subequal, broadly rounded. *Stamens* inserted about the middle of the corolla-tube, exerted; filaments flat, glabrous below, above beset with hairs similar to those of the corolla; anthers oblong, 2.2 mm. long, cohering in pairs at the apex. *Disc* annular, 1.2 mm. long. *Pistil* linear, eventually overtopping the stamens, glabrous below, above beset with hairs similar to those of the corolla. *Capsule* linear, glabrous, strongly curved, 15–18 cm. long, the valves everted

and complicate after dehiscence. *Seeds* oblong, granulate, minute, with a single fine silky hair at each end.

Delei Valley, 28° 21' N : 96° 37' E, 5000 ft., fls. scarlet with a short black stripe down each lobe, July, *F. Kingdon Ward* 8447, "epiphyte in thickets, often hanging in long festoons. *Leaves* very hard and leathery."

Aeschynanthus linearifolia C. E. C. Fischer, sp. nov. [Gesneriaceae]; ab *Ae. bracteata* Wall. foliis angustis elongatis, nervis obsoletis, floribus bracteolisque minoribus recedit.

A glabrous *epiphyte*: branches fistular, grey. *Leaves* coriaceous, linear-oblongate, apex bluntly acuminate, base obtuse, midrib impressed above, very prominent below, margins narrowly cartilaginous and slightly revolute when dry, often pitted below, 5.5–10.1 cm. long, 0.8–1.3 cm. wide; petiole channelled above, rugulose, 4–7 mm. long. *Flowers* terminal or axillary; peduncles solitary or fascicled, 1-flowered, 0.8–2 cm. long, subtended by minute, fleshy, ovate bracts; pedicels 5–7 mm. long, slender, subtended by 2 broadly ovate, obtuse bracteoles 0.7–1 cm. long. *Calyx* 1.2–2 cm. long; tube 1–6 mm. long; lobes subequal, ligulate or linear-lanceolate, obtuse or subacute. *Corolla* tubular, slightly widened upwards, more or less curved, 2.5–3.5 cm. long; lobes subequal, broadly oblong, rounded, 4.5–5.5 mm. long, apical margins minutely ciliate. *Stamens* inserted about the middle of the corolla-tube; filaments slender, glabrous below, beset upwards with gland-tipped hairs; anthers shortly exerted, broadly ovate, subcordate, 2.5–3 mm. long, cohering in pairs by the apex. *Disc* annular, fleshy, 1.5 mm. long. *Pistil* linear, included, glabrous. *Fruit* (only one seen) linear, 9 cm. long, curved. *Seeds* not seen.

Delei Valley, 28° 21' N : 96° 37' E, 8000 ft., fls. July, *F. Kingdon Ward* 8470, "Epiphyte in the rain forest. Calyx scarlet, lower half of corolla bright-yellow, upper half almost scarlet, giving an orange effect in combination, the lip spotted." The bracteoles are similar in colour and texture to the calyx in the dry state.

Elsholtzia Thompsoni Hook.f. [Labiateae].

Oudh.

Garro Hills: Richu, 100 ft. fls. pale-mauve, *Mrs. N. E. Parry* 1279. Garro name: *Ducra*.

Celtis sinensis Pers. [Ulmaceae].

China.

Delei Valley 28° 5' N : 96° 30' E, 2000 ft., unripe frt. April, *F. Kingdon Ward* 8007, "a large deciduous tree. Bark grey, smooth, hard, thin, wood very hard, tangential section just below the bark showing a number of short tangential lines (medullary rays) on a brighter background. Abundant in the jungle and conspicuous now for its bright-green foliage."

Lloydia Forrestii Diels [Liliaceae].

W. China.

Delei Valley: Kaso, 28° 21' N: 96° 37' E, 12,000–13,000 ft. fls. July, *F. Kingdon Ward* 8403. "Petals egg-yellow, brown at the base. On alpine turf and meadow slopes on both sides of the ridge in thousands."

XXXII—COLEUS BARBATUS BENTH. E. A. BRUCE.

In the course of naming a collection of plants from Somaliland a question of the status of *Coleus barbatus* Benth. has arisen. This species was described by Bentham in Wall. Pl. As. Rar. 2, 15 (1831), the following names being included as synonyms:—

Plectranthus Forskøhlil Willd. Sp. Pl. 3, 169 (1801); Bot. Mag. t. 2036 (1819), and Vahl? (1790). *P. crassifolius* Willd. l.c. (1801) and Vahl? (1790). *P. barbatus* Andr. Bot. Rep. t. 594 (1809). *P. comosus* Bot. Mag. t. 2318 (1822) and *Ocimum hadiense* et *O. zatarhendi* Forsk.? (1775).

As *hadiense* is the oldest specific epithet it should take precedence over *barbatus*, provided the plants are identical. To ascertain this, *O. hadiense* and other species of *Ocimum* were obtained on loan from Forsskaal's Herbarium, so that a critical examination of the species could be made. It was found, however, that *O. hadiense* was not identical with *C. barbatus* and should be excluded from the synonymy, as well as *P. crassifolius* and *P. comosus*. *C. barbatus* was synonymous with *Plectranthus Forskøhlil* of the Bot. Mag. but not of Vahl and of Willdenow. The epithet *barbatus*, therefore, still stands:—

Coleus barbatus Benth. in Wall, Pl. As. Rar. 2, 15 (1831).

Plectranthus barbatus Andr. Bot. Rep. t. 594 (1809).

Plectranthus Forskøhlil Ait. Hort. Kew. 3, 425 (1811); Bot. Mag. t. 2036 (1819).

Coleus Forskøhlil Briq. in Engl. & Prantl. Pflanzenfam. 4, 3a, 359 (1897).

The three specimens received as *Ocimum hadiense* Forssk. were examined with a view to establishing their relation to other species. Two of the plants appear to be the same, whilst the third, on which *Plectranthus Forskalaei* has been written, is rather different with longer pedicels and a smaller, more glabrous calyx. These specimens were compared with Forsskaal's original description in Fl. Aegypt, Arab. 109 (1775); the first two conform more closely with it, except for the following:—

"... foliis obtusis..." "..... folia ad basin pedunculi conferta." It seems probable that this part of the description refers to *Ocimum α Zatarhendi* Forssk.

O. hadiense, as represented by these two specimens, was then compared with Kew material and was found to be identical with *Ocimum menthifolium* Hochst. ex Benth. (1848).

Carl Christensen, in Dansk Bot. Arkiv. 4, 21 (1922), has published some notes on Forsskaal's Herbarium. He regarded *O. hadiense* Forssk. as a *Plectranthus* and made the combination *Plectranthus hadiensis* (Forssk.) C. Chr. He overlooked the fact, however, that this name had already been used by Schweinfurth for an Abyssinian plant (Wein. Ill. Gart. Zeit. 2: 1894). Christensen's combination, therefore, is invalid. I consider Forsskaal's specimen to be an *Ocimum*, as it has the characteristic decurrent calyx of that genus.

The original combination should therefore be retained as follows:—

Ocimum hadiense Forssk. Fl. Aegypt. Arab. 109 (1775).

Ocimum menthifolium Hochst. ex Benth. in DC. Prod. 12, 34 (1848).

Plectranthus hadiensis (Forssk.) C. Chr. l.c. 21 (1922) non Schweinf.

The third sheet sent out as *O. hadiense* has not been identified with any of Forsskaal's descriptions or with material in the Kew herbarium. It shows some affinity with *Orthosiphon pallidus* Royle, originally described from India, but found also in Arabia.

The specimen of *Ocimum α Zatarhendi* Forssk. closely conforms with Forsskaal's description. But Carl Christensen has pointed out (Dansk Bot. Arkiv. 4, 21) that "Zatarhendi" is really a generic name, and the specific name should be *aegyptiacum*, whilst that of *O. β Zatarhendi* should be *villosum*, as implied by Forsskaal, l.c. 115, n. 368. Christensen transfers the first species to the genus *Plectranthus* as follows:—

Plectranthus aegyptiacus (Forssk.) C. Chr. l.c. 21 (1922).

Ocimum aegyptiacum Forssk. l.c. 115, n. 368 (1775).

Ocimum α Zatarhendi Forssk. l.c. 109 (1775).

Plectranthus Forskalaei Vahl Symb. Bot. 1, 44 (1790).

Coleus Zatarhendi (Forssk.) Benth. Lab. Gen. et Sp. 50 (1832).

Each author since Bentham's time has assumed that Vahl's (1790) and Willdenow's (1801) descriptions of *Plectranthus Forskalaei* were different, but in reality the one is exactly a transcription of the other, and the name should be attributed to Vahl, not to Willdenow as done by Bentham.

To the above should also be added the following synonymy:—

Germanea Forskolaei Poir. Dict. Suppl. 2, 764 (1811).

Plectranthus rupestris Baker in Fl. Trop. Afr. 5, 409 (1900).

and to *Plectranthus Forskalaei* Vahl the reference:—

Willd. Sp. Pl. 3, 169 (1801).

Plectranthus madagascariensis Benth. is included in this synonymy by Christensen, but it seems to be rather different with its shorter pedicels, fewer flowers to each bract, rougher indumentum and in its geographical position.

The type of *Ocimum β Zatarhendi* Forssk. appears to be lost (Christensen says "non repertum"), so Forsskaal's original descrip-

tion was compared with Kew material. It was found that a specimen collected by Schweinfurth (no. 690) at Wolledje, Gebel Melhan, Arabia, and named "*Plectranthus quadridentatus*" by C. B. Clarke agreed with this description but not with the true *P. quadridentatus* Schweinfurth.

As stated above *O. β. Zatarhendi* is equal to *O. villosum* Forssk. This has been transferred by Carl Christensen to the genus *Plectranthus* and the combination *P. villosus* made. Unfortunately this is invalid, having previously been used by Sieber in Benth. Lab. Gen. et Sp. 38 (1832) and T. Cooke in Kew Bull. 1909; so a new name is necessary:—

***Plectranthus arabicus* E. A. Bruce, nom. nov.**

Ocimum β Zatarhendi Forssk. (1775).

Ocimum villosum Forssk. (1775).

Plectranthus villosus (Forssk.) C.Ch. (1922) non Sieb. nec Cooke.

XXXIII—A GRASS WITH SPIRAL PHYLLOTAXIS— *MICRAIRA SUBULIFOLIA*. W. R. PHILIPSON.

A very constant vegetative character of the *Gramineae* is the regular distichous arrangement of the leaves. Mrs. Arber, in her recent work on the *Gramineae*, states that a spiral arrangement may be superficially produced in some species by a twisting of the axis, or, as in the reed, by a slipping of the leaf sheaths over one

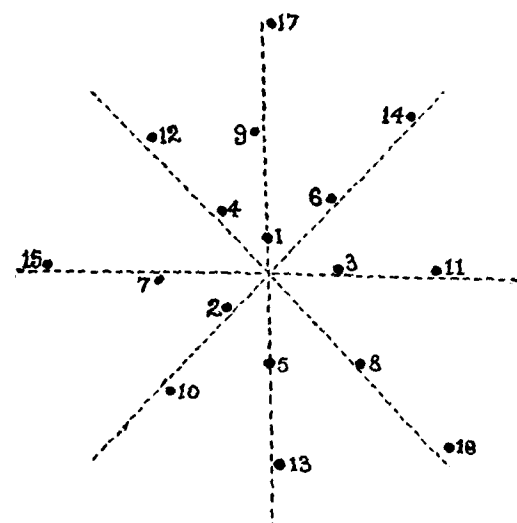


Fig 1. Transverse section passing through the youngest leaf at the apex of the stem. Positions of successive mid-ribs plotted with the camera lucida. The broken lines are separated by an angle of 45°, showing the $\frac{2}{3}$ phyllotaxis, with the 9th mid-rib on the same radius as the 1st.

another. She does not record any instance of true spiral phyllotaxis where the leaf primordia are separated from each other by less than half the circumference. The only suggestion that spiral phyllotaxis may occur in a grass which I have been able to discover, is that put forward by Weatherwax (*Am. Midland Nat.* 16, 1: 1935) to explain the structure of the female inflorescence of maize. *Streptochaeta spicata* Shrad. has been considered to have parts of its spikelets arranged in spirals, but close investigation by Arber (*Ann. Bot.* 43, 35: 1929) did not confirm this view.

My attention was drawn to the peculiar habit and external morphology of *Micraira subulifolia* F. Muell. by Mr. C. E. Hubbard who very kindly put at my disposal the ample herbarium material which he had collected in Queensland in 1930-31 (Glass House Mts., Mt. Ngungun, Hubbard 3380, 5918). The grass grows on the flat tops of volcanic mountains, creeping over the surface to form moss-like carpets. Numerous erect sterile shoots are formed with closely imbricate, spirally arranged, minute leaves. The leaves do not depart from the grass type, having a deeply furrowed blade, a row of hairs for a ligule, and a sheath which enwraps the stem. The blades are separated from the sheaths by a regular abscission layer, and become shed on the lower part of the shoot. The fine axis remains clothed with the overlapping sheaths, and adventitious roots, which form in the stem, grow downwards among the dry sheaths, finally emerging as small prop roots, which help to maintain the shoots erect.

In order to determine if the external spiral arrangement was due to an abnormal phyllotaxis or to later changes in the growth of the axis, several shoots were sectioned with the microtome. In order to soften the dried material and restore the parts as much as possible to their original form, the shoots were subjected to McLean's treatment as modified by Arber (*Ann. Bot.* 40, 447: 1926).

The sections which passed through the apices of these shoots show that the second leaf does not arise opposite the first, as in a normal grass, but slightly to one side. When the mid-ribs of successive leaves are plotted by means of the camera lucida, as in fig. 1, it is seen that the distance between them is fairly constant, and seems to approximate more nearly to $\frac{2}{3}$ the circumference of the axis than to any other of the usual schemes of phyllotaxis.

The spiral arrangement is not due to a twisting of the internodes, because the nerves of the leaves run straight through the cortex for several internodes from the point of insertion of the leaf until they fuse with the central system of bundles. Nor is it due to a twisting of the sheaths, as these are inclined straight outwards from the stem, like the feathers of a shuttle-cock.

The outer cortex becomes sclerenchymatous in the older parts of the stem, and this tissue is seen in section (fig. 2) to present eight ridges and eight depressions to the outside of the stem. It is in the region of these depressions that the leaf traces pass out.

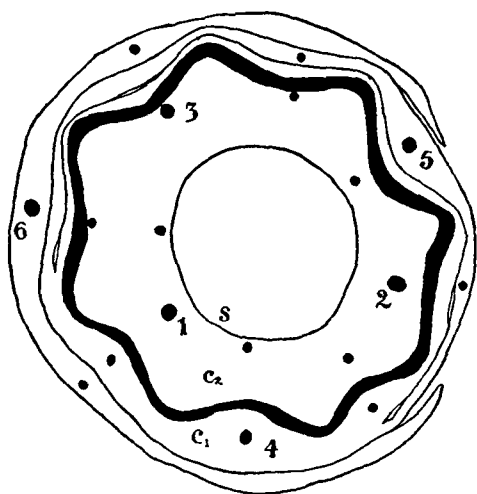


Fig. 2. Transverse section through an older part of the stem. Sclerenchymatous tissue and vascular bundles in solid black. Successive mid-ribs numbered. C₁, C₂, outer and inner cortex; S, central system of bundles.

and it can be seen that each mid-rib is separated from that of the preceding leaf by two of these furrows, an arrangement that results in the ninth mid-rib after that of any given leaf passing out through the same furrow, which confirms that the phyllotaxis is $\frac{2}{3}$. In the basal region of one of the shoots examined the mid-ribs appeared to be arranged in four longitudinal rows instead of eight, and it is probable that in the young plant the typical distichous arrangement is found.

This species is also aberrant in the structure of its spikelets, having a palea with six nerves instead of the two usual in grasses.

XXXIV—CONTRIBUTIONS TO THE FLORA OF SIAM.* ADDITAMENTUM XXXIX.

Iodocephalus glandulosus Kerr [Compositae—Vernonieae]; affinis *I. Eberhardtii* Gagnep., sed habitu erecto foliisque acutis differt.

Herba annua, erecta, 40–60 cm. alta. *Caulis* parce ramosus, leviter striatus, pilis brunneis T-formatis apresse hirsutus et plus minusve luteo-glanduloso-punctatus. *Folia* alterna, petiolata, lanceolata vel elliptica, apice acuta vel mucronulata, basi acuta, leviter inaequilateralia, supra viridia, subtus pallidiora, pagina utraque ad costam nervosque laterales tomentosa, aliter parce hirsuta, subtus glandulis luteis praedita, nervis lateralibus utrinque

4–6, supra subprominulis, subtus prominentibus, margine distanter minuteque mucronulo-dentata; petiolus 2–12 mm. longus; lamina 1.5–6.5 cm. longa, 0.6–2.5 cm. lata. *Inflorescentia* leviter paniculata, 3–5 capitula gerens; pedunculi capitulorum ad 2.5 cm. longi, 2–3 bracteis praediti. *Capitula* campanulata, c. 7 mm. longa, 7–8 mm. lata. *Involucri bractee* 3–4 seriatæ, ovatae vel lineari-obovatae, acutae vel sub-spinosae, exteriores gradatim breviores, dorso hirsutae glanduloso-punctataeque, 2–5.5 mm. longae, 1–1.75 mm. latae. *Flosculi* c. 20–25, leviter exserti, purpurei vel albi. *Corollae* tubus sursum leviter dilatatus, extus glandulis pilisque paucè instructus, 2.5 mm. longus; lobi 5, triangulares, 2.25 mm. longi. *Antherae* apice apiculatae, basi truncato-auriculatae. *Stylus* cum ramis 2.5 mm. longus, basi disco annulato cinctus, supra hirtellus, ramis subulatis hirtellis. *Achaenia* 2.75 mm. longa, oblongo-obovoidea, supra leviter rotundata, 10-costata, glandulis numerosis intercostalibus instructa; pappus O. *Receptaculum* subplanum, alveolis annulis membranaceis minutis cinctis.

Doi Sutep, c. 1200 m., in evergreen forest, Kerr 789.

Camchaya loloana Kerr [Compositae—Vernonieae]; a *C. tenuiflora* Kerr, cui maxime affinis, involucri bracteis subappressis, setis brevioribus paucioribus ornatis, recedit.

Herba annua, circa 50–80 cm. alta. *Caulis* erectus, sulcatus, parce ramosus, ramis striatis; caulis ramique pilis medifixis appressis et glandulis parcis instructi; rami laterales breves, plus minusve 10 cm. longi. *Folia* infera lanceolata, apice subacuta, basi attenuata, margine undulata, pagina utraque glanduloso-punctata et pilis albis, rigidis, brevibus, parce instructa, ad costam nervosque hirsutiora, ad 6 cm. longa, 2.3 cm. lata; folia supra parviora, ovata, apice obtusa, basi rotundata. *Capitula* hemisphaerica, circa 0.7 cm. diametro, pedunculo 0.2–1.8 cm. longo suffulta. *Involucri bractee* multiseriatæ, subappressae, exteriores gradatim minores, lanceolatae, longe acuminatae, margine ciliatae, dorso appresso-hirsutae glandulosaeque, 3–7 mm. longae, 0.75–1.25 mm. latae; intimae oblongo-lanceolatae, apice acutissimae, margine breviter cilatae, dorso apicem versus pilis glandulisque paucis instructae, 8 mm. longae, 1 mm. latae. *Corolla* purpurea, tubo tenui apicem versus gradatim dilatato, extus glanduloso-piloso, 5 mm. longo, limbo 5-fido, lobis triangularis, 2 mm. longis. *Antherae* 1.5 mm. longae. *Styli* rami exserti. *Achaenia* longe obovata, 10-costata, glabra, 2 mm. longa; pappi setae paucissimae, caducissimae, 2 mm. longae.

Chiengdao, c. 1100 m., in open oak and pine forest, Kerr 6650.

The name *loloana* is an unpublished name of S. T. Dunn, written under *Vernonia*, on the Yunnan sheets of Henry 12375a and 12375b, which are conspecific with the Siamese plant.

Camchaya tenuiflora Kerr [Compositae—Vernonieae]; a *Thorelia montana* Gagnep. floribus longioribus acheniisque pappo interdum ornatis distinguenda.

* Continued from K.B. 1933, 30

Herba annua, erecta, circa 50 cm. alta. *Caulis* sulcatus, ramosus, ramis divaricatis, striatis; caulis ramique pilis medifixis appressis instructi. *Folia* ovato-oblonga vel ovata, apice subacuta, basi attenuata, margine undulata, ad 10 cm. longa, 3 cm. lata, superiora gradatim parviora, pagina utraque dense glanduloso-punctata parceque hirsuta, ad costam nervosque hirsutiora, nervis lateralibus utrinque 8-12, supra subprominulis, subtus prominentibus; petiolus 0.3-1 cm. longus, subamplexicaulis, supra caniculatus, margine caniculi pilis particoloratis instructus. *Capitula* terminalia axillariaque, solitaria, semiglobosa, 0.8 cm. longa, 1 cm. diametro, pedunculis 2.5-4 cm. longis. *Involucri* bractee multi-seriatae, exteriores gradatim parviores, patulae, lineari-ovatae vel lineares, longe acuminatae, margine apicem versus setis satis longis ornatae, dorso pilosae glanduloso-punctataeque, 2.5-6.5 mm. longae, 0.5-1.75 mm. latae; intimae lineari-oblongae, leviter acuminatae, dorso apicem versus pilis brevibus parce instructae, 7 mm. longae, 1.25 mm. latae. *Flosculi* 20-30. *Corolla* 5-lobata, purpurea; tubus pergracilis, extus pilis glandulosis instructus, 6 mm. longus; lobi triangulares, obtusi, glabri, 2 mm. longi. *Antherae* apice appendiculatae, appendiculis triangularis, obtusis, basi auriculatae, auriculis obtusis, 1.75 mm. longae. *Stylus* glaber, basi disco annuliformi, lobato, 0.5 mm. longo, cinctus, armis hirtellis. *Achaenia* oblongo-ovoidea, apice rotundata, glabra, eglandulosa, 10-costata, costis striatis, sulcis intercostalibus foveatis, 2 mm. longa, 0.5 mm. lata, pappo 1-2 setarum, 0.5 mm. longo, caducissimo interdum ornata. *Receptaculum* planum, nudum.

Bangkok, cultivated from seeds from Chaipayum province, Kerr 20563.

This species is very closely allied to *Thorelia montana* Gagnep., differing from the description of that species in the points noted above. The chief distinction between *Camchaya* Gagnep. and *Thorelia* Gagnep. is the presence of a pappus in the former and not in the latter. This is not as obvious a distinction as it might seem. In the species under consideration the pappus is very scanty and fugacious, moreover it does not seem to be present in all the florets of a capitulum. In the writer's opinion *Thorelia* and *Camchaya* are too close to be kept up as distinct genera, and *Thorelia* should be sunk in *Camchaya*. In any case the name *Thorelia* was not available when proposed by Gagnepain, as it had previously been used by Hance for a myrtaceous plant, now usually regarded as a *Tristania*.

The sinking of *Thorelia* involves only one change: *Thorelia montana* Gagnep. becomes:

Camchaya montana (Gagnep.) Kerr, comb. nov.

Vernonia Craibiana Kerr [Compositae—Vernonieae]; *V. Chevalieri* Gagnep. similis sed foliis pro rata angustioribus, achaeniis pilosis inter alia distinguenda.

Frutex scandens; ramuli juventute brunneo-pilosi mox glabrescentes, sicco fere nigri, striati. *Folia* oblongo-ovata, apice longe

acuminata, basi cuneata vel rotundata, margine leviter undulata, ad 13 cm. longa, 3 cm. lata, juventute pagina utraque parce pilosa, cito glabrescentia, nervis lateralibus utrinque 5-7, nervis nervulisque pagina utraque conspicuis, subtus prominentibus, petiolo 0.8-1.3 cm. longo suffulta. *Capitula* in paniculas ramulos laterales terminantes disposita, c. 1 cm. longa, 0.7 cm. lata, pedunculo 1-2-bracteato, 2-4 mm. longo, suffulta. *Involucri* bractee pluri-seriatae, ab exteriori gradatim longiores; exteriores ovatae, acutae, dorso glabrae, margine ciliatae, 2-4.5 mm. longae, 1.5-2 mm. latae; interiores oblongo-obovatae, subciliatae, 6.5 mm. longae, 1.75 mm. latae, 3-nervatae. *Receptaculum* leviter convexum, pilis brunneis instructum. *Flosculi* 8-11. *Corolla* sub-campanulata, glabra, 6.5 mm. longa, lobis 2 mm. longis, purpurea. *Antherae* 3.5 mm. longae, appendiculis obtusis, auriculis truncatis. *Stylus* basi disco breve cinctus. *Achaenia* leviter 10-costata, pilosa, 3 mm. longa; pappus 1-seriatus, rufus, 7 mm. longus.

Korat, Kao Lem, c. 700 m., climbing on trees at edge of evergreen forest, Kerr 9969.

Vernonia sangka Kerr [Compositae—Vernonieae]; a *V. blanda* Wall. ex DC., cui affinis, involucri bracteis pro rata multo latioribus, minus acutis, differt.

Frutex scandens, ramulis leviter striatis, dense brunneo-tomentosis. *Folia* ovata vel elliptico-ovata, apice breviter acuminata, basi cuneata, inaequilateralis, margine undulata, 2.5-10 cm. longa, 1.2-4.5 cm. lata, supra ad costam nervosque laterales pilosa, aliter glabrescentia, subtus pilosa glandulo-punctataque, ad costam nervosque tomentosa, nervis lateralibus utrinque 5-7, subtus prominentibus, nervis transversis prominulis; petiolus dense tomentosus, supra caniculatus, 4-10 mm. longus. *Capitula* in ramos laterales vel terminales disposita, c. 12 mm. longa, 15 mm. lata, pedunculis 2-5 mm. longis suffulta. *Involucri* bractee pluriseriatae; exteriores ovatae, acutiusculae, 1.5-3 mm. longae, 0.75-1 mm. latae, dense pilosae glandulisque instructae; interiores lineari-oblongae, ad 6 mm. longae, 1.5 mm. latae, apicem versus pilosae glandulosaeque. *Flosculi* 10-20, purpurei. *Corolla* 7.5 mm. longa, lobis 2 mm. longis, extus glandulis parce instructa. *Achaenia* 2.5 mm. longa, 10-costata, pilosa; pappus uniseriatus, brunneo-fulvus. *Receptaculum* nudum.

Sangka (Siam)—Samrawng (Cambodia) boundary, c. 300 m., scrub by stream, Kerr 8302.

Vernonia sutepensis Kerr [Compositae—Vernonieae]; affinis *V. Kingii* C. B. Clarke, foliis tomentosis pro rata latioribus, inflorescentia folia excedenti, inter alia differt.

Herba erecta, ad 1 m. alta. *Caulis* striatus, interdum quadrangulatus, primo brunneo-pubescent, mox glabrescent. *Folia* elliptica vel ovato-elliptica, apice subacuta, basi late cuneata rotundatave, margine creno-dentata, ad 7 cm. longa, 3 cm. lata, supra scabrida,

subtus dense brunneo-tomentosa, praesertim ad costam nervosque, nervis lateralibus utrinque 6–8 cum nervis transversalibus subtus prominentibus, supra prominulis; petiolus 3–5 mm. longus, dense tomentosus. *Paniculae* terminales axillariaeque, folia multo excedentes. *Capitula* campanulata, 8–10 mm. diametro, circa 25 flosculos ferentia, pedunculis dense brunneo-tomentosis, 0.5–2.5 mm. longis, suffulta. *Involucris* bracteae multi-seriatae; exteriores gradatim parviores, patentes, anguste triangulares, apice acutae mucronatae, margine longe brunneo-ciliatae, dorso parce glanduloso-pilosae, 1.75 mm. longae, 0.75 mm. latae; medianae appressae, ovatae obovatae, dorso apicem versus nigro-brunneae, apice fortiter subulo-mucronatae, margine longissime brunneo-ciliatae, ad 5 mm. longae, 1.75 mm. latae; intimae lineares vel lineari-obovatae, apice tenue erosae vel breviter mucronulatae, margine integrae vel breviter ciliatae, dorso breviter parceque glanduloso-pilosae ad 12 mm. longae, 1.25 mm. latae. *Corolla* purpurea, extus parce glandulosa; tubus 10 mm. longus; lobi anguste triangulares, 2.5 mm. longi. *Antherae* 2.5 mm. longae. *Achaenia*, vix matura, 2.5 mm. longa, indistincte sulcatula, longe pilosa; pappus biseriatus, albus, 8 mm. longus. *Receptaculum* planum foveolatum, glabrum.

Doi Sutep, 1200–1650 m., common in evergreen forest, *Kerr* 3561.

***Gynura calciphila* Kerr** [Compositae—Senecionideae]; a *G. ovali* DC. foliis cordatis longe petiolatis recedit.

Herba perennis. *Caulis* succosus, 10–20 cm. longus, parce breviter crispatis pubescens, inferne nudus, superne foliosus. *Folia* late ovato-cordata, vel hastata, ad 7.5 cm. longa, 4 cm. lata, apice obtusa, basi cordata, rarius cuneata, margine grosse sinuato-dentata, pagina utraque breviter crispatis pubescentia, nervis lateralibus utrinque 4–5, obscuris; petiolus 4–6 cm. longus, tenue pubescens, basi auriculatus, auriculis lobatis. *Inflorescentia* terminalis, ex 2–6 capitulis in corymbum laxum dispositis constans, scapo 20–30 cm. longo suffulta. *Capitula* campanulata, pedunculis 1–3 cm. longis, 2–3 bracteis linearibus ornatis, suffulta. *Involucris* bracteae interiores 13, lineari-lanceolatae, 7 mm. longae, 1.5 mm. latae, margine scariosae, dorso parce pilosae; exteriores lineares, c. 3 mm. longae. *Flosculi* 50–60, bene exserti. *Corolla* lutea, c. 9 mm. longa, 5-lobata, lobis 0.75 mm. longis. *Antherae* 1.5 mm. longae, filamentis apice dilatatis suffultae. *Styli* rami 3 mm. longi, dimidio superiore hirtelli. *Achaenia* 3.5 mm. longa, 10-costata, minute punctata, glabra; pappus copiosus, albus, c. 6 mm. longus. *Receptaculum* planum, papillatum.

Chumpawn, Siepyuan, *Put* 953.

Though no particulars of the habitat of this plant are given on the label, it was almost certainly collected on the limestone hills at Siepyuan. There are several other collections of this species, all from limestone hills, where the plant is found growing in rock crevices.

***Gynura longifolia* Kerr** [Compositae—Senecionideae]; affinis *G. bicolori* DC., foliis elongato-oblongis, distanter mucro-dentatis, petiolis auriculatis distinguenda.

Planta scandens, surculis brunneo-pubescentibus, cito vix omnino glabra. *Caulis* leviter striatus, sparsim foliosus. *Folia* elongato-oblonga, basi attenuata, rotundata, apice longe attenuata, acuta, ad 22 cm. longa, 3 cm. lata, margine distanter mucro-dentata, sicco supra nigro-fuscentia, subtus pallidiora, costa subtus parce hirsuta, aliter glabra, nervis lateralibus utrinque circa 12, supra obscuris subtus subprominulis, petiolo ad 0.5 cm. longo, supra caniculato, subtus pilis brunneis parce induto, basi utrinque auricula reniformi breviter pedicellata instructo, suffulta; folia summa imminuta. *Capitula* in corymbum laxum disposita, pedunculis 1.5–3 cm. longis, 2–4 bracteis filiformibus instructis, suffulta. *Involucris* bracteae lineares acutae glabrae, interiores margine scariosae, 1 cm. longae, 0.25 cm. latae, exteriores multo breviores. *Flosculi* circa 50, bene exserti. *Corolla* lutea, 13–5 mm. longa, 5-lobata, lobis anguste triangularibus. *Antherae* semi-exsertae, 2 mm. longae, filamentis apice dilatatis suffultae. *Styli* rami 3–5 mm. longi, dimidio superiore hirtelli, demum extrusi. *Achaenia* 4–5 mm. longa, 10-costata, costis minute punctatis, sulcis breviter puberulis; pappus copiosus, albus, 12–14 mm. longus. *Receptaculum* leviter convexum, fimbriatum.

Doi Sutep, c. 1670 m., *Kerr* 3195.

***Gynura truncata* Kerr** [Compositae—Senecionideae]; a *G. angulosa* DC. foliis obtuse lobatis, basi truncatis recedit.

Herba erecta, c. 1.5 m. alta. *Ramuli* valde sulcati, juventute satis dense griseo-hirsuti, mox sparse hirsuti. *Folia* superiora (inferiora non visa) sessilia, haud auriculata, lanceolata, basi truncata, apice rotundata, margine altius pinnatim lobata, lobis utrinque 7–8, rotundatis, pagina utraque minute verrucosa, sicco nigro-brunnea, supra pilis paucis, ad marginem copiosioribus, instructa, subtus pilosa glanduloso-punctataque, nervis lateralibus utrinque 7–8 inconspicuis, ad 10 cm. longa, 4 cm. lata. *Capitula* lateralia vel terminalia, pedunculis 4–7 cm. longis suffulta. *Involucris* bracteae exteriores lineares, c. 8 mm. longae, 0.75 mm. latae, dorso parce hirsutae; interiores, 13 mm. longae, 2 mm. latae, dorso hirsutae, marginibus scariosae. *Corollae* tubus c. 15 mm. longus, glaber, sursum gradatim dilatatus; lobi 1.25 mm. longi, extus parce pilosi. *Antherae* c. 2.5 mm. longae, filamentis apicem versus dilatatis suffultae. *Styli* rami 2 mm. longi, hirtelli. *Achaenia* 10-costata, inter costas papillosa, 4 mm. longa; pappus copiosus, c. 12 mm. longus. *Receptaculum* planum papillosum.

Korat, Bua Yai, c. 200 m., in deciduous forest, *Kerr* 20484.

***Saussurea venosa* Kerr** [Compositae—Cynaroideae]; affinis *S. deltoideae* C. B. Clarke, sed involucris bracteis exterioribus foliaceis, foliis caulinis intermediis sessilibus semiamplexicaulibus differt.

Herba erecta c. 50-60 cm. alta. *Caulis* striatus glandulopilosus leviterque araneosus, dimidio superiore paniculate ramificatus. *Folia* radicalia non visa; folia caulina inferiora ad 8.5 cm. longa, 4 cm. lata, petiolata, pinnatisecta, utrinque 4-5 lobis angulolobulatis, lobis lobulisque apice mucronata, margine plus minusve revoluta, petiolis ad 3.5 cm. longis, saepius plus minusve alatis, canaliculatis, basi subamplexicaulibus, suffulta; folia caulina intermedia sessilia, pinnatim lobatim, basi auriculata semiamplexicaulia; folia suprema lanceolata, margine sinuato-dentata, basi leviter auriculata; omnia supra sicco nigro-brunnea scabrida, subtus ad costam nervosque pilis resiniferis luteis crebre instructa aliter dense niveo-araneosa. *Capitula* solitaria, ramulos laterales terminantia, ad 2 cm. diametro. *Involucri* bractee exteriores foliaceae, interiores excedentes, indumento ei foliorum simili; interiores oblongo-lineares, ad 12 mm. longae, 1.25 mm. latae, apice longe attenuatae, biflectae, dorso brunneo-pilosae, margine ciliatae. *Flosculi* 20-30. *Corolla* alba, 10 mm. longa; tubus 7.5 mm. longus, apicem versus subito dilatatus; lobi 2.5 mm. longi. *Antherae* purpureo-brunneae, c. 3.5 mm. longae, exsertae, basi longe fimbriato-caudatae. *Achaenia* c. 2.5 mm. longa, 4-angulata, ad angulos tuberculata; pappus pallide fuscus, 8 mm. longus, uniseriatus, plumosus. *Receptaculi* fimbriellae c. 8 mm. longae, achaenia multo excedentes.

Doi Chiengdao, c. 2100 m., open rocky ground, *Kerr* 6613.

***Lactuca Garrettii* Kerr** [Compositae—Cichorieae]; ab affini *L. hastata* DC. capitulis maioribus, foliis magis lobatis recedit.

Herba robusta, erecta, 50 cm. alta vel ultra. *Caulis* fistulosus, crebre striatus, juventute leviter brunneo-tomentosus, mox glabrescens, superne ramosus. *Folia* radicalia non visa; folia caulina sessilia, inaequaliter pinnatim lobata, ad 17 cm. longa, 5 cm. lata, lobo terminali ad 8 cm. longo, 3.5 cm. lato, apice longe sensimque acuminato, acuto, lobis lateralibus utrinque 1-3, obtusis, mucronatis, ad 2.5 cm. longis, 1.7 cm. latis, margine remote mucro-dentata, basi auriculata, amplexicaulia, supra glabrescentia, subtus ad costam nervosque prominentes sparsim brunneo-tomentosa. *Capitula* pedunculis 1.5-7 cm. longis, brunneo-tomentosis, suffulta. *Involucri* bractee pluri-seriatae, glabrae, introrsum sensim maiores; exteriores 3 mm. longae; interiores ad 13 mm. longae, 2 mm. latae, margine anguste scariosae. *Flosculi* c. 12, violacei (ex *Garrett*). *Corollae* tubus 5 mm. longus; ligula 12 mm. longa, 5 mm. lata. *Antherae* 5.5 mm. longae. *Achaenia* (omnia matura visa imperfecta, basi erosa) compressa, fere nigra, in rostrum pallidius c. 4.5 mm. longum sensim attenuatum, disco pappifero 0.75 mm. diametro; pappus interior albus, c. 7 mm. longus; pappus exterior ex setis brevissimis constans.

Doi Ka, Pa Ngem, 2145-2195 m., *Garrett* 68.

***Lactuca Putii* Kerr** [Compositae—Cichorieae]; species *L. hastata* DC. affinis a qua capitulis minoribus 4-5-floris differt.

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Herba erecta 60 cm. alta vel ultra. *Caulis* superne paniculatum ramosus, parce crispatis brunneo-tomentosus. *Folia* radicalia non visa; folia caulina petiolata, lyrata, ad 9 cm. longa, 4.8 cm. lata, supra parce breviter pilosa, subtus brunneo-tomentosa praesertim ad costam nervosque, margine dentata, lobo terminali late ovato, breviter acuminato, ad 7 cm. longo, 4.8 cm. lato, lobis lateralibus duobus, ad 1.2 cm. altis, 1.2 cm. latis, rotundatis; petiolus plus minusve alatus, basi interdum leviter auriculatus. *Capitula* nutantia, 4-5-flora, in ramos breves laterales racemiforme disposita. *Involucri* bractee pluriseriatae, inaequales, interiores gradatim maiores; exteriores ovatae, sub-acutae, dorso minute glandulopunctatae, 3-6 mm. longae, 1.5 mm. latae; interiores lineari-oblongae, ad 15 mm. longae, 2.5 mm. latae. *Corollae* tubus 8 mm. longus; ligula 7 mm. longa, 2 mm. lata. *Achaenia* compressa, fere nigra, supra minute hispidula, 7 mm. longa, margine incrassata, utraque facie 3-costata, basi leviter contracta, sursum in rostrum 4 mm. longum sensim attenuata, disco pappifero 0.75 mm. diametro; pappus albus, c. 6 mm. longus; pappus exterior nullus.

Doi Chiengdao, *Put* 367.

***Lactuca riparia* Kerr** [Compositae—Cichorieae]; *L. polycephalae* Benth. affinis, foliis pinnatilobatis, capitulis minoribus inter alia differt.

Herba erecta, probabiliter annua, superne ramosa, ad 40 cm. alta. *Caulis* leviter striatus. *Folia* radicalia pinnatilobata, interdum fere pinnata, petiolata, ad 12 cm. longa, petiolo incluso, 1.7 cm. lata, lobis utrinque 3-4, ovatis apiculatis, ad 0.8 cm. longis, 0.6 cm. latis, infimis multo minoribus, lobo terminali late ovato, ad 2 cm. longo, 1.5 cm. lato; petiolus gracilis, ad 3.5 cm. longus, basi amplexitens, haud auriculatus; folia caulina inferiora minus lobata, petiolo alato basi leviter auriculato; folia superiora sessilia, hastato-triangularia, apice breviter acuminata, basi auriculata, amplexicaulia, auriculis dentatis. *Capitula* in corymbum late ramosum, minute bracteatum, disposita, pedunculis filiformibus ad 1.5 cm. longis suffulta. *Involucri* bractee exteriores aequales triangulariae, 0.75 mm. longae; interiores lineari-lanceolatae, 4 mm. longae, 1 mm. latae. *Flosculi* 16-23 pro capitulo. *Corolla* pallide flava, tubo 1.5 mm. longo, ligula 3 mm. longa, 5-dentata. *Antherae* 1.5 mm. longae, apice truncatae, basi breviter setiferae. *Achaenia* fusca, elliptica, compressa, valde costata, secus costas hispidula, 1.75 mm. longa, apice in rostrum tenue fuscum minute hispidulum, 2.75 mm. longum, angustata; pappus albus, uniseriatus, 3 mm. longus. *Receptaculum* papillatum.

Ubon, Chanuman, on banks of Mè Kong, *Kerr* 8386.

***Lactuca siamensis* Kerr** [Compositae—Cichorieae]; a *L. chinensi* Makino achenii rostro multo brevior, a *L. gracili* DC. capitulis maioribus acheniis longioribus brevius rostratis recedit.

Herba gracilis, erecta, glabra, ad 50 cm. alta. Caulis leviter striata. Folia radicalia longe petiolata, lineari-oblonga, apice rotundata, mucronata, basi longe attenuata, margine integra vel distanter minuteque mucro-dentata, ad 10 cm. longa, 2 cm. lata, petiolo ad 5 cm. longo suffulta; folia caulina similia, sed parviora, sessilia, basi interdum leviter auriculata, auriculis dentatis. Capitula in corymbum late ramosum disposita. Involucri bractee 2-seriatae; exteriores triangulares, 0.75 mm. longae; interiores 11 mm. longae, 1 mm. latae, margine scariosae. Flosculi c. 10, lutei. Corollae tubus c. 3 mm. longus; ligula 7 mm. longa. Achaenia compressa, 6.5 mm. longa, in rostrum breve, c. 1 mm. longum, gradatim attenuata, 8-10 costata, costis minute scabridis; pappus albus, c. 4 mm. longus.

Lôi, Kao Krading, c. 1200 m., in open grassy ground, *Kerr* 8714.

Pentaphragma Winitii *Craib* [Campanulaceae—Campanuleae]; a *P. gamopetalo* Gagnep. caule brevior, staminibus corolla brevioribus, corollae lobis longioribus recedens.

*Caulis brevis, crassus. Folia alterna, subelliptica, parum inaequilateralia, apice rotundata, basi cuneata, circa 15 cm. longa et 8 cm. lata, chartacea, sicca supra subviridia, subtus pallide brunnea, supra setulis brevibus sparse sed apud marginem crebrius instructa, subtus praesertim ad nervos barbellata, costa supra conspicua subtus lata prominente, nervis lateralibus utrinque 5-6 supra conspicuis subtus prominulis intra marginem anastomosantibus, ciliata, petiolo 5.5-7.5 cm. longo barbato suffulta. Inflorescentia spiciformis, axillaris, pedunculo communi ad 1 cm. longo incluso, ad 3.5 cm. longa; bractee inferiores oblongo-spatulatae, circa 6 mm. longae et 3 mm. latae; pedicelli breves; bracteolae deficientes. Calycis segmenta 5, oblonga vel quadrata, apice rotundata, circa 3 mm. longa, 1.5-3 mm. lata, subintegra, nervis tribus, glabra. Corolla alba (ex *Winit*), carnosa, calyci subaequilonga, ad medium 5-lobata, lobis lanceolato-deltoideis obtusis. Filamenta 1 mm. longa, antheris apiculatis filamentis subaequilongis.*

Nan, Mè Sanian, 390 m., evergreen forest, *Winit* 1786.

Agapetes saxicola *Craib* [Vacciniaceae—Thibaudieae]; species foliis inter minora, corymbis paucifloris conspicue bracteatis pilis glanduloso-capitatis instructis, antheris dorso calcaratis distincta.

Frutex ad 1 m. altus (ex Kerr), ramosus, basi tuberosus; ramuli primo pilis longiusculis divergentibus glanduloso-capitatis instructi, mox glabri, demum ad 5 mm. diametro, cortice griseo vel brunneo-griseo obtecti. Folia elliptica vel oblongo-elliptica, apice obtusa, basi rotundata vel cuneato-rotundata, ad 2 cm. longa et 1.1 cm. lata, primo chartacea, mox coriacea, sicco subtus pallidiora, pagina superiore pilis paucis, inferiore pilis longioribus glanduloso-capitatis sparse instructa, costa supra impressa subtus prominula, nervis lateralibus utrinque 4-5 obscuris, margine revoluta, basi vel paulo supra basem glandula latere utroque saepissime instructa, breviter

petiolata. Corymbi e ligno annotino orti, saepissime triflori, floribus inclusis ad 3.5 cm. longi, rhachi basi perulata, bracteis inferioribus sterilibus sublanceolatis 1 cm. longis cum rhachi et pedicellis pilis glanduloso-capitatis tectis; pedicelli 1.5 cm. longi apice articulati; flores albi vel pallide punicei (ex Kerr). Receptaculum pilis longiusculis glanduloso-capitatis instructum, 2 mm. longum. Calycis segmenta deltoidea, acutiuscula, 2 mm. longa, 1.5 mm. lata, dorso pilis paucis glanduloso-capitatis instructa. Corolla campanulata, tubo 7 mm. longo extra pilis glanduloso-capitatis sparse instructo, lobis 6 mm. longis. Filamenta complanata, 4 mm. longa, pilosa, loculis 3.5 mm. longis apice tubuloso-productis, tubis 7 mm. longis ad 0.5 mm. supra basem cornubus duobus 1.75 mm. longis instructis. Discus glaber. Stylus 12 mm. longus, glaber; ovarii loculi 5.

Lôi, Kao Krading, 1200 m., on rocks, *Kerr* 8696.

XXXV—MISCELLANEOUS NOTES.

Birthday and Jubilee Honours.—We record with pleasure the conferment of the following honours:—C.M.G.—MR. E. HARRISON, Director of Agriculture, Tanganyika Territory, and MR. E. J. WORTLEY, O.B.E., Director of Agriculture, Trinidad. O.B.E.—MR. H. WOLFE, Deputy-Director of Agriculture, Kenya Colony. I.S.O.—MR. W. DALLIMORE, V.M.H., Keeper of the Museums, Royal Botanic Gardens, Kew. M.B.E.—MRS. NORA ALCOCK, Plant Pathologist, Department of Agriculture for Scotland, and MR. G. WALTON, Assistant Agriculturist, Northern Rhodesia.

DR. F. N. HOWES.—We record with pleasure the conferment of the degree of Doctor of Science on Mr. F. N. Howes, Botanist in the Museum Department, by the University of South Africa.

DR. E. D. MERRILL.—Dr. E. D. Merrill, Professor of Botany at Columbia University and Director-in-Chief of the New York Botanic Garden since 1930, has been appointed Professor of Botany and Administrator of the Botanical Collections at Harvard University.

MR. R. O. WILLIAMS.—Mr. R. O. Williams, Assistant Director of Agriculture, Trinidad, has been appointed Chief Horticultural Officer, Palestine. Mr. Williams, who left Kew in 1916, has done much valuable work on the flora of Trinidad during his term of office there.

MR. J. C. NAUEN.—Mr. J. C. Nauen, Horticulturist, Department of Agriculture, Bermuda, who left Kew in 1928, has been appointed Assistant Curator at the Botanic Garden, Singapore.

PROFESSOR WENT.—We learn with regret, on going to press, of the death on July 24th, of Professor F.A.F.C. Went, F.L.S., Professor of Botany and Director of the Botanic Garden, Utrecht. An account of Professor Went's work will appear in a subsequent number of the Bulletin.

HENRY WILLIAM CLINTON-BAKER.—Mr. H. W. Clinton-Baker, the Squire of Bayfordbury, Hertford, who died at his home on April 19th, after an attack of pneumonia, was a frequent correspondent of Kew, and will be remembered for his interest in arboriculture, and particularly his devotion to conifers. He was born in 1865 and inherited the Bayfordbury estates on the death of his father in 1903. The pinetum at Bayfordbury, established by Mr. Baker's grandfather in 1837, became one of the most famous in the country. Here also flourish the celebrated cedars, planted in 1765 by Sir William Baker to celebrate the building of the house. It was a happy instance of heredity in tastes that the late Squire should be an enthusiastic student and cultivator of conifers. He made a considerable number of additions to the pinetum during his lifetime, and, shortly before the war, commenced the formation of a new pinetum at Bell's Wood, Bayford, where he has planted most of the new species of conifers introduced from Eastern Asia during the present century. Through his efforts and the co-operation of his brother, Admiral Sir Lewis Clinton-Baker, *Fokienia hodginsii* and *Cupressus formosensis* were brought into cultivation. Mr. Baker's interest in conifers culminated in 1909 when he published two handsome quarto volumes, "Illustrations of Conifers," which contain life-size portraits of the cones and foliage of hardy conifers. A third volume followed in 1913. This work forms an important contribution to the literature of the group. The present writer has prepared a supplementary volume containing photographs of Chinese and other conifers introduced since 1913, and it is much to be regretted that Mr. Baker has not lived to see its completion.

A. BRUCE JACKSON.

The Liberty Hyde Bailey Herbarium.—The herbarium of cultivated plants formed by Dr. L. H. Bailey, of Ithaca, N.Y., has just been presented by him to Cornell University. It comprises over 125,000 mounted herbarium sheets, and includes types of new species of palms, *Carex*, *Vitis*, *Rubus* and other groups. Included in the gift, which will be known as the "Liberty Hyde Bailey Hortorium," in allusion to its character of a horticultural herbarium, are a library of 4,000 volumes, thousands of photographs, the buildings in which the collection is housed, and about a quarter of an acre of surrounding land.

The Archegoniatae*.—Prof. Bower states in his preface that this work deals with the same problem as "The Origin of a Land Flora," though "it is in no sense a second edition of the earlier work." There is, in fact, little resemblance between the two books. The twenty-seven years which have passed since the publication of the "Origin" have seen great changes in the organographic study of primitive vegetation. New facts have been discovered, new theories promulgated, while the influence of Size upon Form, with which subject Prof. Bower's name is intimately connected, was a factor entirely ignored in 1908.

The plan of the work is entirely different from that of the "Origin." The first 23 chapters deal with the various classes of the *Archegoniatae* mainly from a descriptive standpoint. They are treated progressively, starting with the *Anthocerotales* and terminating with the more recent *Filicales*. The second part, consisting of six chapters, is devoted to a series of discussions on features common to the *Archegoniatae* as a whole, e.g. "Alternation and the Land Habit," and "The Conducting System." The work closes with a general organographic analysis and a summary of results and conclusions.

It is inevitable that a work of this kind, supplied as it is with a wealth of illustrations, should be used as a textbook for students. Such, however, is not its primary object. The descriptive side of the work is the groundwork upon which Prof. Bower builds up, with his familiar dexterity, the probable story of Archegoniate plants.

Much of the interest of the book lies in the final eight chapters. The summing-up of the *Bryophyta* discloses an interesting point which may be new to some. One is familiar with the ventilation system of the *Marchantiales* and the foliar elaboration of the *Jungermanniales*, yet no Bryophyte has succeeded in combining these two features in one and the same individual. As Bower says, "Their stunted habit is itself a witness to their lack of morphological initiative in this matter." It was, however, the sporophyte that eventually became dominant on the land and the vascular cryptogams form the main subject of Prof. Bower's considerations.

The interrelationships of size and form have materially affected some of Prof. Bower's earlier views as expressed in the "Origin." He indicates the worthlessness of Jeffrey's anatomical distinctions between the microphyllous Pteridophytes ("*Lycopside*") and the megaphyllous Pteridophytes ("*Pteropsida*"). The latter were characterised as possessing foliar gaps while the former were stated to be without them. As Prof. Bower points out, a foliar gap has no phyletic significance but denotes a size relation of the leaf to the axis which bears it.

* "Primitive Land Plants also known as the Archegoniatae" by F. O. Bower, Sc.D., LL.D., F.R.S. Macmillan & Co., Ltd., London, 1935. Pp. xiv + 658, 449 figures. Price 30/- net.

The telome theory of Zimmermann (1930), or rather a modified form of it, is successfully used by Bower in the interpretation of sporophyte morphology. The telome-unit is composed of a distal sporangium with a stalk supplied usually with a vascular supply. By the linking together of these constructional units in various ways, complex plant bodies may be produced. Prof. Bower finds it necessary to introduce the "enation," which is essentially a lateral, secondary and initially sterile structure, to account for such outgrowths as hairs, scales, spines and small photosynthetic leaves. He finds in Zimmermann's theory a valuable aid in clarifying "the relation of many floating facts already used comparatively but without linkage by specific designation."

Prof. Bower's new work is of the type we have come to associate with him—original, stimulating and written with a charm of style which few botanical writers could emulate. A few of his conclusions and hypotheses will undoubtedly be challenged by other workers in the same field, but that is inevitable and indeed not undesirable. Prof. Bower himself would be the last to suggest that his own personal opinions represented the final word that could be said on the subject.

"Primitive Land Plants" is fittingly dedicated to the friend and former colleague of the author, the late Dr. D. H. Scott, whose famous researches on fossil plants were complementary to those of Professor Bower.

F. BALLARD

Dominions Wild Flowers.*—Lady Rockley has performed a signal service, in this year of the Jubilee of His Majesty the King, in publishing her beautifully-illustrated book "Wild Flowers of the Great Dominions of the British Empire."

At a time when the Dominions and Colonies of the British Empire are so much in our thoughts, Lady Rockley's delightfully-written account of her travels in Canada and Newfoundland, British Columbia, Australia and Tasmania, New Zealand, South Africa, Natal, Rhodesia and Kenya—illustrated mainly by her own vivid and faithful water-colour sketches—cannot fail to be of very great interest not only to gardeners and plant-lovers of the British Isles, but also to lovers of flowers overseas.

The first section of the book, dealing with Canada, Newfoundland and British Columbia, contains a well-written account of the conifers, which are so striking a feature of the Dominion; and the water-colour drawing "Among the Firs of British Columbia" is a fine example of the author's skill as an artist. This is followed by an account of the early spring flowers to be met with throughout the Dominion; an account which will vividly recall the carpets of beauty to those who have seen the spring display of flowers—many

of which we treasure in our gardens—and which will fire those who have not visited the Dominion with a keen desire to do so. The summer flowers, shrubs and plants bearing edible berries are dealt with in detail, special mention being made of the lilies and interesting orchids native to Canada and British Columbia, some of which are well figured.

One hundred pages of the book are devoted to an account of the flowers and trees of Australia, none too many for the wealth of material to be found in the Commonwealth the flora of which she so fully describes. Possibly the most interesting of Lady Rockley's series of flower studies is her plate of the remarkable West Australian orchids of the genus *Caladenia*, and many will consider the sketch of "The Old White Gum" the best picture in the book. It certainly will appeal to all those who have been in the country and have viewed similar landscapes.

The unique and beautiful flora of Western Australia gives scope alike for her pen and her brush where the Christmas tree (*Nuytsia*), Leschenaultias, and the various kangaroo paws (*Anigozanthos*) are among some of the more remarkable plants in this botanical paradise.

The New Zealand flora, with its tree ferns, Cordylines, *Metrosideros* and *Leptospermums*, is described and illustrated in the next fifty pages, and a fine picture of the beautiful white New Zealand alpine flowers is well reproduced. This includes *Ranunculus Lyallii*, so fine a plant in its native home but so difficult to grow successfully at home, *Celmisias*, *Clematis indivisa*, and the New Zealand Edelweiss, *Leucogenes*. The white-flowered *Ourisias*, *Senecio scorzoneroideus*, and many white-flowered *Veronicas* (*Hebe*) which occur on the higher mountains, might also have been included, but they are fully referred to in the text.

The rest of the book, some 116 pages, is devoted to the flowers and general vegetation of South Africa, Rhodesia and Kenya. Only one of the nine excellent plates in this section is reproduced from Lady Rockley's drawings; this is a characteristic collection of nineteen wild flowers brought together from many different localities.

It is impossible in a brief review to do justice to the book, which must be read throughout in order to gain—as one can—a very true and comprehensive impression of the flowers of the Dominions. Lady Rockley has certainly achieved her aim and purpose with singular ability in conveying a vivid picture of the wealth and variety of the trees and flowers and of their brilliant colouring, and of the wide expanses of desert and veld. When one knows the rapidity with which she travelled and the vast distances she covered, often making her sketches from train or car, Lady Rockley is to be congratulated on having presented to plant lovers both at home and overseas so arresting a picture of the botanical wonders of the British Dominions. By her book she deserves to be styled not only "a citizen and gardener of London" but also of the British Dominions.

* "Wild Flowers of the Great Dominions of the British Empire" by The Lady Rockley, C.B.E., Citizen and Gardener of London. Macmillan & Co., Ltd., 1935. Pp. xii + 380. Illustrated. Price 16s.

BULLETIN OF MISCELLANEOUS
INFORMATION No. 6, 7, 8 & 9 1935
ROYAL BOTANIC GARDENS, KEW

The Botanist in Ireland.*—Dr. Praeger, with the publication of this volume, has further increased the great debt owed him by professional and amateur botanists in all parts of the world. The task of writing a scientific work which, at the same time, is intended to serve as a guide book for a botanical holiday is no easy one, and we know of few authors who could have performed it so successfully as Dr. Praeger.

The work is divided into four sections. The first deals with the geology, topography and climate of the country. There is a striking photograph of *Dryas* and *Habenaria intacta* growing side by side, showing the mixture of climatic types in Western Ireland. In the second part the author discusses the several botanical features of the country from many aspects, including ecological divisions and the effect of human interference. Especially useful is a series of notes on rare or interesting plants in the Irish flora. Here much information is gathered together in one place that hitherto had to be sought in scattered books and periodicals.

The main section of the book consists of an account of the Irish flora arranged topographically. For example, under the general heading of the County of Cork there are three sub-headings, Cork City, the Bandon-Kinsall area, and West Cork, under each of which are described the features most worthy of note to the botanical traveller in that particular area. Scattered through this section are numerous maps, plans, geological diagrams, bibliographies, lists of plants, and plates of localities and plants of special interest. This section must be unique in botanical literature and gives the reader an extraordinarily vivid yet scientifically accurate picture of the floral wealth of Ireland.

The last section comprises a Census List of the flora based on the standard of the 11th edition of the London Catalogue, the counties in which each species occurs being indicated by numbers. This list gives in convenient form a summary of the same author's "Irish Topographical Botany" and its Supplements. A very full index completes the work.

In a short review it is impossible to deal in any detail with a volume so packed with information. The novel use of section numbers in place of page numbers is on the whole successful, though the transition to page numbers for the Census list is, perhaps, somewhat confusing. One feature must be singled out for special mention. The plates, the majority of which are from photographs by Mr. R. Welch, are exceptionally fine, combining artistic beauty with a faithful representation of the types of vegetation depicted. Dr. Praeger is to be congratulated on producing a volume which is worthy of his long and patient study of the flora of his native country and which will be an inspiration to many others to follow in his steps.

* By R. Lloyd Praeger, D.Sc. Hodges, Figgis & Co., Publishers to the University, Dublin, 1934. Pp. xii + 587 (sections). Figs. 28. Plates 44. Price 12s. 6d.

XXXVI—CONSERVATION OF LATER GENERIC HOMONYMS.

A. REHDER, C. A. WEATHERBY, R. MANSFELD AND M. L. GREEN.

At the Fifth International Botanical Congress held in Cambridge in 1930, the rule concerning homonyms was altered. Up to that time, botanists following the Rules adopted the earliest available name even if it were a later homonym, provided that the earlier homonym had become a synonym. There were differences of opinion as to whether the earlier homonym had to be a nomenclatural synonym or merely a taxonomic synonym. A full account of these discussions, as well as the result of the ballot, can be read in the Report of the Proceedings of the Fifth International Botanical Congress, Cambridge, 1930, pp. 600–605 (1931).

The Rule concerning homonyms now reads: "A name of a taxonomic group is illegitimate and must be rejected if it is a later homonym, that is if it duplicates a name previously and validly published for a group of the same rank based on a different type. Even if the earlier homonym is illegitimate or is generally treated as a synonym on taxonomic grounds, the later homonym must be rejected" (Art. 61, Intern. Rules of Bot. Nomencl. ed. 3, 1935).

The homonym rule was adopted at Cambridge on the definite understanding that all well-known generic homonyms should, as far as possible, be conserved, in order that the changes in nomenclature due to the change in the Rules should be as few as possible.

For this reason, therefore, a systematic search has been made for later homonyms, using as a basis Dalla Torre & Harms, *Genera Siphonogamarum* and the later supplements of the *Index Kewensis*. The principal references to the employment of each later homonym in important monographs, floras and other standard systematic works have been noted.

The cases have been worked out in detail, and usually a recommendation is made for or against the conservation of the particular generic name concerned.

The work has been undertaken by the following botanists:—

Letters A–B by Prof. A. Rehder of the Arnold Arboretum;
Letter C by Mr. C. A. Weatherby of the Gray Herbarium;

Letters L-P by Dr. R. Mansfeld of the Botanisches Museum, Berlin;

Letters Q-Z by Miss M. L. Green of the Royal Botanic Gardens, Kew.

The cases dealing with the later homonyms contained in the letters D-K will be published at a later date.

The same general plan has been adopted by all writers, although there are some small differences in methods of citation, etc. Each author is responsible for his own contribution. The decisions reached are, of course, not put forward as final, and it is hoped that monographers of groups, and authorities on particular genera, will communicate any differences of opinion either to the authors themselves or to the special committee appointed to consider the cases.

M. L. GREEN.

STATEMENT OF CASES FOR AND AGAINST CONSERVATION.

LETTERS A AND B BY A. REHDER

(The author has included some names for conservation other than homonyms.)

1774 *Abola* Lindl. Fol. Orch. (1853)

versus

Abola Adanson, Fam. II. 31 (1763).

Abola Lindl. Orchidaceae.

Adopted by: Benth. & Hook. f. Gen. III. 566 (1883); Engler & Prantl, Nat. Pflanzenfam. II.-6, p. 198 (1889); Dalla Torre & Harms, Gen. Siphonog. 109, no. 1774 (1900); Lemée, Dict. Pl. Phan. I. 5 (1929).—One species in Colombia.

Standard species: *A. radiata* Lindl. l. c.; the only species of the genus.

Abola Adans. Fam. II. 31 (1763) belonging to the Gramineae has never been adopted by any author and has remained without a specific name. It is a synonym of *Cinna* L. which has priority.

Considering the fact that *Abola* Lindl. a monotypic genus, it is advisable to accept *Caucaea* Schlechter, Orchideenfl. Colomb. 189 (1920) with the standard species: *C. radiata* (Lindl.) Mansfeld in Fedde, xxxv. 343 (1934).

7835 *Acanthonema* Hook. f. in Bot. Mag. LXXXVIII. t. 5339 (1862)

versus

Acanthonema J. G. Agardh in Svensk. Vet. Akad. Handl. 1846, p. 13.

Acanthonema Hook. f. Gesneriaceae.

Adopted by: Benth. & Hook. f. Gen. Pl. III. 1021 (1876); Clarke in DC. Monog. Phan. V. 156 (1883); Engl. & Prantl, Nat. Pflanzenfam. IV.-3, p. 156 (1894); Dalla Torre & Harms, Gen. Siphonog. 472, no. 7835 (1904); Thiselton-Dyer, Fl. Trop.

Afr. IV. 2, p. 502 (1906); Lemée, Dict. Pl. Phan. I. 16 (1929); Hutchins. & Dalz., Fl. W. Trop. Afr. II. 1, p. 237 (1931).—One species in West Trop. Afr.

Standard species: *A. strigosum* Hook. f., l. c., the only species of the genus.

Acanthonema J. G. Ag. (Algae-Cladophoraceae) is reduced by Wille (in Engl. & Prantl, Nat. Pflanzenfam. I. 2, p. 118, 1890) to *Cladophora* Kütz.

In view of the universal acceptance of *Acanthonema* Hook. f. and the fact that there is no synonym to take its place, it is desirable to conserve it against *Acanthonema* J. G. Ag. Dr. Wm. R. Taylor, a member of the Special Committee on Algae, agrees that *Acanthonema* J. G. Ag. may be relinquished.

268 *Achneria* ["Beauv."] Munro in Harvey, Gen. Pl. Cap. ed. 2, 449 (1868)

versus

Achneria Beauvois, Agrost. 72 (1812).

Achneria Beauv. sensu Munro. Gramineae.

Adopted by: Benth. & Hook. f. Gen. III. 1158 (1883); Engler & Prantl, Nat. Pflanzenfam. II. 2, p. 54 (1887); Durand & Schinz, Consp. Fl. Afr. V. 836 (1894); Thiselton-Dyer, Fl. Cap. VII. 456 (1889); Dalla Torre & Harms, Gen. Siphonog. 19, no. 268 (1900); Marloth, Fl. S. Afr. IV. 30 (1915); Lemée, Dict. Pl. Phan. I. 30 (1929).—About 10 species in S. Africa.

Standard species: *Achneria capensis* (Steud.) Dur. & Schinz (*Eriachne capensis* Steud.), the most widely distributed and the first of the S. African species described under *Eriachne*: the genus having been based by Munro on the South African species of *Eriachne*.

Achneria Beauv. belonging also to the Gramineae does not seem to have been accepted by any botanist; it is a synonym or perhaps a section of the earlier *Eriachne* R. Br. (1810).

Though *Achneria* Munro has been generally accepted it does not seem advisable to conserve it, since Munro did not propose a new genus; he only referred 7 African species to *Achneria* Beauvois without indicating that he did not regard the Australian species as congeneric. It was Bentham & Hooker, Gen. Pl. III. 1158 (1883) who definitely separated the African species as *Achneria* Munro non Beauv. By Phillips, Gen. S. Afr. Flow. Pl. 92 (1926) *Achneria* Munro is referred to *Pentastichis* Stapf in This.-Dyer, Fl. Cap. VII. 180 (1899) as a synonym, and probably others will follow him in this disposal. Anyone, however, who maintains *Achneria* Munro as distinct from *Pentastichis*, should adopt the name *Afrachneria* Sprague (Journ. Bot. 1922, 138) for the group, rather than use a name shifted from its original sense to another

group and based on a different type species, which is against the principle of the type method; it may be justified in very few cases when it is the question of conserving universally accepted names of large and important genera as *Alpinia* Roxb. non L., *Protea* R. Br. non L., and *Banksia* L. f. non Forst.

4415 *Acidoton* Swartz, Prodr. Veg. Ind. Occ. 83 (1788)

versus

Acidoton P. Browne, Hist. Jam. 335 (1756).

Acidoton Swartz. Euphorbiaceae.

Adopted by: Swartz, Fl. Ind. Occ. II. 954 (1800); Willdenow, Sp. Pl. IV. 420 (1805); Spach, Végét. Phan. II. 487 (1834); Endl. Gen. Pl. 1116 (1840); Baillon, Ét. Gen. Euphorb. 401 (1858); Grisebach, Fl. Brit. W. Ind. 45 (1864); Mueller-Arg. in DC. Prodr. XV. 2, p. 914 (1866); Benth. & Hook. f. Gen. III. 328 (1880); Engl. & Prantl, Nat. Pflanzenfam. III.-5, p. 64 (1890); ed. 2, XIX.^c 143 (1931); Dalla Torre & Harms, Gen. Siphonog. 277, no. 4415 (1901); Urban, Symb. Antill. III. 302 (1902); Engl. Pflanzenr. IV.-147, ix-xi, p. 24 (1919); Fawcett & Rendle, Fl. Jam. IV. 2, p. 303 (1920); Urb. & Ekm. in Ark. Bot. 209, no. 15, p. 60 (1926); Lemée, Dict. Pl. Phan. I. 37 (1929).—4 species in the W. Indies.

Standard species: *A. urens* Sw. (l. c.), the original species.

Acidoton P. Br. belonging also to the Euphorbiaceae has been adopted only by Ktze. Rev. Gen. II. 591 (1891) and Post & Ktze. Lex. Gen. Phan. 5 (1904). It is a synonym of *Securinega* Juss. (1789) which is a nomen conservandum (see Règl. Internat. 1912, p. 92, no. 4297); therefore *Acidoton* P. Br. cannot be used under the International Rules.

In view of the universal acceptance of *Acidoton* Sw. it is desirable to conserve it. If not conserved, the name of the genus will become *Durandeeldea* Ktze. Rev. Gen. II. 603 (1891); Post & Ktze. Lex. Gen. Phan. 189 (1904) which does not seem to have been used by any other author.

Actinella Lewis in Proc. Acad. Phila. XV. 343, pl. [3] fig. 5 (1863)

versus

Actinella Persoon, Syn. II. 469 (1807).

Actinella Lewis. Schizophyta-Bacillariaceae.

Adopted by: Van Heurck, Syn. Diat. Belg. pl. 35, figs. 16-21 (1884); De Toni, Syll. Alg. II.², 816 (1892); Engl. & Prantl, Nat. Pflanzenf. I.-1^b, p. 119 (1896); Van Heurck, Traité Diatom. 306, fig. 70 (1899).—Four species, fossil and in fresh water.

Standard species: *A. punctata* Lewis, l. c., the original species.

Actinella Pers. Syn. II. 469 (1807) belonging to the Compositae-Helenieae-Heleniinae is an illegitimate name, proposed by Persoon for *Actinea* Juss. in Ann. Mus. Paris, II. 425 (1803), because of the older zoological name *Actinia* belonging to the Mollusks. Also *Ptilepida* Raf. in Am. Month. Mag. 1818, p. 268 is illegitimate, having been proposed as a substitute for the two preceding names. *Actinella* Pers. was adopted by Nuttall, Gen. Am. II. 173 (1818); et in Am. Phil. Trans. n. ser. VII. 378 (1841); Torrey & Gray, Fl. N. Am. II. 381 (1842); Gray, Man. ed. 5, 263 (1872); Benth. & Hook. f. Gen. II. 414 (1873); Gray, Syn. Fl. N. Am. I.-2, p. 344 (1886); Engl. & Prantl, Nat. Pflanzenfam. IV.-5, p. 262 (1890); Dalla Torre & Harms, Gen. 555, no. 9304 (1905). The type of *Actinella* Pers. is *A. heterophylla* (Juss.) Pers., a South American species, but Nuttall referred to the genus a North American plant, *A. acaulis*, and based the generic description chiefly on this species. In this conception the genus was taken up by the authors cited above. By some authors *Actinella* Pers. and *Actinella* Nutt. were considered distinct genera based on different types, but according to Macbride (in Contrib. Gray Herb. n. ser. LVI. 40: 1918) *Actinea heterophylla* and *A. acaulis* are congeneric.

Considering the fact that *Actinella* Pers. is an illegitimate name which has been abandoned by recent authors for the older *Actinea* Juss. the conservation of *Actinella* Lewis is to be recommended. The genus apparently has no synonym to take its place, but it has been referred to *Desmogonium* Ehrenb. in Schomb. Reise, 539 (1848) by some authors as De Toni, Syll. Alg. II.-2, p. 816 (1892) and Van Heurck, Traité Diatom. 304 (1899).

Even if *Actinella* Lewis is not conserved, it does not seem advisable to conserve *Actinella* Pers., but the oldest name *Actinea* Juss. should be accepted, which was adopted by: Willd. Spec. III.-3, p. 2213 (1804); Cassini in Dict. Sci. Nat. Suppl. 51 (1816); Spreng. Syst. III. 574 (1826); Kunth, Syn. Pl. Orb. Nov. II. 512 (1823); Spach, Hist. Vég. X. 17 (1841); Ktze. Rev. Gen. I. 303 (1891); Robins. & Fern. Gray's Man. ed. 7, p. 844 (1908); Macbride in Contr. Gray Herb. n. ser. LVI. 40 (1918); Lemée, Dict. Pl. Phan. I. 57 (1929). Up to 1841 the genus was considered restricted to South American species, but by Kuntze it was revived in the sense of *Actinella* Nutt. including the North American species and based chiefly on *A. acaulis* Nutt. If the South and North American species are considered generically distinct the name for the northern genus would be *Tetranneuris* Greene (1898) with the type species *T. acaulis* (Nutt.) Greene, and the South American species would remain under *Actinea* Juss. with the type *A. heterophylla* Juss.

Adelanthus Mitt. in Jour. Linn. Soc. Bot. VII. 243 (1864)

versus

Adelanthus Endl. Gen. 1327 (1841); Suppl. II. 30 (1842).

Adelanthus Mitt. Jungermanniaceae akrogynae.

Adopted by: Spruce in Jour. Bot. XIV. 196 (1876); Schiffner in Engl. & Prantl, Nat. Pflanzenfam I. 3, p. 99 (1895).—7 species in the subantarctic, tropical and northern temperate region.

Standard species: *A. decipiens* (Hook.) Mitt. (l. c.) (*Jungermannia decipiens* Hooker in Engl. Bot. t. 2657, 1813), the best known and most widely distributed of the original species.

Synon.: *Adelocolia* Mitten in Hemsley, Voy. H. M. S. Challenger, Bot. I. pt. 2, p. 106 (1884).

Adelanthus Endl. belonging to the Icacinaceae is a synonym of *Pyrenacantha* Wight (1831) which is a nomen conservandum versus *Cavanilla* Thunb. of 1792 (see Règl. Internat. 1912, p. 93, no. 4709). The genus was adopted only by Meisner, Pl. Vasc. Gen. 256 (1842) and Baillon, Ét. Euphorb. 662 (1858); in 1852 it was referred by R. Brown in Horsfield, Pl. Jav. 245 to *Pyrenacantha* and was treated by all later authors except Baillon (1858) as a synonym of that genus.

In view of the fact that *Adelanthus* Mitt. has been generally accepted, it seems desirable to conserve it. If not conserved the name *Adelocolia* Mitten apparently not adopted by any later author, would have to take its place. *Adelanthus* Endl. is now universally considered a synonym of *Pyrenacantha* Hook. f. and there seems no possibility that it ever will be separated generically from that genus.

4397 *Adella* L., Syst. ed. 10, II. 1298 (1759), in part

versus

Adelia P. Br., Nat. Hist. Jam. 361 (1756) and

Adelia Britton & Wilson, Bot. Porto Rico & Virg. Isl. V. 487 (1924).

Adelia L. Euphorbiaceae.

Adopted by: Willd. Spec. IV. 867, 1850 (1805), in part; Persoon, Syn. II. 635 (1807), in part; Sprengel, Syst. III. 147 (1826), in part; Endl. Gen. 1117 (1840), in part; Baillon, Ét. Euphorb. 417 (1858); Griseb. Fl. Brit. W. Indies 45 (1864); Benth. & Hook. f. Gen. III. 312 (1880); Pax in Engl. & Prantl, Nat. Pflanzenfam. III.-5, p. 57 (1890); ed. 2, xixc, 109 (1931); Urban in Bot. Jahrb. XV. 338 (1893); Dalla Torre & Harms, Gen. 276, no. 4397 (1901); Pax & Hoffmann in Engl. Pflanzenr. III. 147, VII, p. 64 (1914); Fawcett & Rendle, Fl. Jam. IV. 291 (1920); Lemée, Dict. Pl. Phan. I. 65 (1929).—About 10 species in the W. Ind. and C. Am., north to Tex. and south to Brazil.

Standard species: *A. Ricinella* L. l. c., the only original species retained in the genus; of the other two *A. Bernardia* is the type of *Bernardia* P. Br. and *A. Acidoton*=*Securinega Acidoton* (L.) Fawc. & Rendle.

Adelia P. Br. belonging to the Oleaceae has been adopted by Michx., Fl. Bor. Am. II. 223 (1803); Kuntze, Rev. Gen. II. 410 (1891); Coville in Contrib. U. S. Nat. Herb. IV. 148 (1893); Britton, Man. 725 (1901); Small, Fl. S. E. U. S. 919 (1903); Fernald & Robinson, Gray, Man. ed. 7, 653 (1908).

Adelia Britton & Wilson belonging to the Euphorbiaceae is based on *A. Bernardia* L., the first of the three original species and is a synonym of *Bernardia* P. Br. It has not been adopted in this sense by any other author.

Considering the fact that *Adelia* L. has been accepted in almost all standard works and that *Adelia* P. Br. has only recently, after 1891, been taken up by a number of authors, it seems advisable to conserve *Adelia* L. If not conserved *Ricinella* Muell. Arg. in Linnaea XXXIV. 153 (1863); in DC. Prodr. XV. 2, p. 729 (1866) will take the place of *Adelia* L.; *Ricinella* has been adopted by Baillon, Hist. Pl. V. 201 (1874); Kuntze, Rev. Gen. II. 615 (1891); Small, Fl. S. E. U. S. 699 (1903) and Britton & Wilson, Bot. Porto Rico & Virg. Isl. V. 488 (1924). The failure of conserving *Adelia* L. will make *Adelia* P. Br. the oldest and valid name for *Forestiera* Poir. in Encycl. Méth. Suppl. I. 132 (1810); II. 664 (1911), if the latter name is not in turn conserved, since it has been generally adopted except in the cases mentioned above under *Adelia* P. Br.

3509 *Afzelia* Sm. in Trans. Linn. Soc. IV. 221 (1798)

versus

Afzelia J. F. Gmelin, Syst. Nat. ed. 13, II. 927 (1791).

Afzelia Sm. Leguminosae.

Adopted by: Jussieu in Dict. Sci. Nat. I. 275 (1804); Persoon, Syn. I. 455 (1805); Sprengel, Syst. II. 345 (1825); DC. Prodr. II. 507 (1825); Endl. Gen. 1319 (1841); Benth. & Hook. f. Gen. I. 580 (1865); Oliver, Fl. Trop. Afr. II. 301 (1871); Dalla Torre & Harms, Gen. Siph. 216, no. 3509 (1901); Hutch. & Dalziel, Fl. West Trop. Afr. I. 344 (1928); Lemée, Dict. Pl. Phan. I. 108 (1929).—About 5 species in tropical Africa.

Standard species: *A. africana* Sm. apud Persoon, l. c., the original species.

Afzelia J. F. Gmelin, belonging to the Scrophulariaceae, has been adopted by Kuntze (Rev. Gen. II. 457. 1891) and by some American authors as Small (Fl. S. E. U. S. 1072, 1338. 1903) and Pennell (in Proc. Acad. Sci. Phila. LXXI. 264 (1919); LXXIII. 506 (1922); LXXVII. (354). 1926). It is a synonym of *Seymeria* Pursh (1814) which is a conserved name (see Règl. Intern. Bot. Nom. 1912, p. 99, no. 7602).

Since *Afzelia* Sm. has been generally accepted, it seems desirable to conserve this name. If not conserved, *Afrazzelia* Pierre, Fl. For. Cochinch. V. sub t. 388 (1899) will be the correct name. If united with *Intsia* Thomas (1809) the name for the combined

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genera will be *Afzelia* as Benth. & Hooker and Dalla Torre & Harms have it, in case *Afzelia* is conserved; or if not conserved, the name for the two genera will be *Intsia* as Taubert in Engler & Prantl, Nat. Pflanzenfam. III.-3, p. 140 (1892) has it. By Prain (in Sci. Mem. Med. Off. India, XII. 14. 1901) *Afzelia* is placed under *Pahudia* Miq.

8757 *Ageratina* O. Hoffmann in Bot. Jahrb. XXVIII. 503 (1900); XXX. 426 (1901)

versus

Ageratina Spach, Hist. Vég. Phan. X. 286 (1841).

Ageratina O. Hoffmann. Compositae.

Adopted by: Dalla Torre & Harms, Gen. Siphon. 525, no. 8757 (1905); Engl. & Prantl, Nat. Pflanzenfam. Nachtr. III. 337 (1908); Lemée, Dict. Pl. Phan. I. 118 (1929).—Two species in C. Africa.

Standard species: *A. Goetzeana* O. Hoffm. l. c., the original species.

Ageratina Spach, belonging also to the Compositae, based on three species of *Eupatorium* L. does not seem to have been adopted by any one.

Considering the fact that *Ageratina* O. Hoffm. has no synonym to take its place, it seems advisable to conserve it. By O. Kuntze in Post & Ktze. Lex. Phan. 275 (1904) it is referred as a section to *Herderia* Cass., to which it is very closely related.

4189 *Aglaiia* Lour. Fl. Cochinch. 173 (1790)

versus

Aglaiia Allemão in Nov. Act. Nat. Cur. IV. 93 (1770).

Camunium Adanson, Fam. II. 166 (1763).

Aglaiia Lour. Meliaceae.

Adopted by: Jack in Malay. Misc. I. 33 (1820); Roemer & Schultes, Syst. VI. 211 (1820); DC. Prodr. I. 537 (1824); Sprengel, Syst. IV. 2, p. 246, 250 (1827); Juss. in Mém. Mus. Paris, XIX. 245 (1830); Endl. Gen. 1048 (1840); Miquel, Fl. Ind. Bat. I. 2, p. 543 (1859); Benth. & Hook. f. Gen. I. 334 (1862); Hook. f. Fl. Brit. Ind. I. 554 (1875); Engl. & Prantl, Nat. Pflanzenfam. III.-4, p. 298 (1896); Dalla Torre & Harms, Gen. Siphon. 261, no. 4189 (1901); Lecomte, Fl. Gén. Indo-Chine, I. 750 (1911); Lemée, Dict. Pl. Phan. I. 120 (1929).—About 100 species in Trop. Asia, Australia and Polynesia.

Standard species: *A. odorata* Lour., the original species.

Aglaiia Allemão belonging to the Cyperaceae was published without a species and was adopted by no one. It is referred to *Cyperus* as a synonym.

Camunium Adanson was adopted only by Roxburgh, Hort. Beng. 18 (1814), nomen; Fl. Ind. I. 636 (1832); the only species *C. chinense* Roxb. is considered a synonym of *A. odorata* Lour.

In view of the fact that *Aglaiia* Lour., has been universally accepted and is a large genus of about 100 species the conservation of this name seems highly desirable. *Aglaiia* Allem. has been adopted by no one. If not conserved, *Aglaiia* would be replaced by *Camunium* which has not been used by any one except Roxburgh and not a single specific epithet has been transferred from *Aglaiia* to *Camunium*.

4168 *Aitonia* Thunbg. in Phys. Sallsk. Handl. (Act. Lund.) I. 166 (1776); Nov. Gen. 52 (1782)

versus

Aytonia Forster, Char. Gen. 147 (1776).

Aitonia Thbg. Meliaceae.

Adopted by: Willd. Spec. III. 690 (1800); Pers. Syn. II. 234 (1807); Endl. Gen. 1052 (1840); Harv. & Sond. Fl. Cap. I. 243 (1860); Benth. & Hook. f. Gen. I. 411 (1862); Engl. & Prantl, Nat. Pflanzenfam. III. 4, p. 280 (1896); Lemée, Dict. Pl. Phan. I. 132 (1929).—One species in S. Afr.

Standard species: *A. capensis* Thbg. l. c., the only species of the genus.

Aytonia Forster, belonging to the Marchantiaceae has been adopted by several authors, e.g. by Nees, Europ. Leberm. IV. 33 (1838) and by Schiffner in Engl. & Prantl, Nat. Pflanzenfam. I. 3, p. 30 (1893), but in 1930 (in Rec. Synopt. V^{me} Congr. Internat. Bot. 115) Schiffner proposed *Plagiochasma* Lehm. & Lndnb. (1832) as a nomen conservandum versus *Aytonia* as a nomen rejiciendum, of which he says "descriptio omnino falsa."

Aitonia and *Aytonia* are different spellings of the same name and Linnaeus f. (Suppl. 49, 303. 1781) used the spelling *Aytonia* for Thunberg's genus, while Nees (Europ. Leberm. IV. 33, 1838) used *Aitonia* for Forster's genus. Both genera are named for the same man; Thunberg says: "in honor. Dom. Aiton, Hortulani in Horto Reg. Kew," while Forster says "Dedimus a Joanne Ayton, Hortulano primario . . . in Horto Kew." Both names were published in 1776, but Forster's work appeared apparently in the beginning of 1776, since the preface is dated November 1775, while Thunberg's publication probably appeared later in the year or even in the following year.

In view of the fact that *Aitonia* Thbg. had been generally accepted in all important publications until 1896, and that *Aytonia* was proposed by Schiffner as a nomen rejiciendum, it seems advisable to conserve *Aitonia*, but on the other hand, considering that *Aitonia* Thbg. is a monotypic genus of restricted distribution and

of no economic importance and has been replaced by *Nymanian* in recent publications, it may be as well not to make an exception from the rule. In that case the name of the genus will be *Nymanian* S. O. Lindb. in Not. Saellsk. Fl. Fenn. IX. 290 (1868), which was adopted by Harms in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. II. 36 (1900), in Dalla Torre & Harms, Gen. Siphon. 260, no. 1468 (1901) and by Marloth, Fl. S. Afr. II. 1, p. 113 (1925). Kuntze having overlooked Lindberg's name proposed *Carruthia* for this genus in 1891 (Rev. Gen. I. 141), but in Post & Ktze. Lex. Gen. Phan. 393 (1904) he accepted *Nymanian* as the correct name.

3575 *Aldina* Endl. Gen. 1322 (1841)

versus

Aldina Adans. Fam. II. 328 (1763) and
Aldinia Scop. Introd. 173 (1777).

Aldina Endl. Leguminosae.

Adopted by: Benth. & Hook. f. Gen. I. 560 (1865); Benth. in Martius, Fl. Brasil. XV. 2, p. 12 (1870); Engl. & Prantl, Nat. Pflanzenfam. III. -3, p. 183 (1892); Dalla Torre & Harms, Gen. Siph. 220, no. 3575 (1901); Lemée, Dict. Pl. Phan. I. 142 (1929); and others.—About five species from Guiana and Brazil.

Type species: *Allania insignis* Benth. in Hook. Lond. Jour. Bot. II. 91 (1840) = *Aldina insignis* (Benth.) Endl. in Walp. Rep. I. 843 (1842); the original species.

Synon.: *Allania* Benth. in Hook. Lond. Jour. Bot. II. 91 (1840), non *Allania* Endl. (1836).

Aldina Adans. belonging to the Leguminosae is a synonym of *Brya* P. Br. (1756); it was adopted by no one and has remained without a specific name.

Aldinia Scop. belonging to the Acanthaceae is a synonym of *Justicia* L. (1753), was adopted by no one and has remained without a specific name.

In view of the fact that *Aldina* Endl. has been universally accepted and has no synonym to take its place, *Allania* Benth. (1840) being a later homonym of *Allania* Endl. (1836),¹ it is advisable to conserve it. If not conserved a new name must be coined.

¹This genus was originally spelled *Alania* by Endlicher, Gen. 151 (1836), but this was apparently a slip of the pen, since it is named for Allan Cunningham, not Alan as Endlicher has it. The mistake was corrected in 1842 by Meisner, Pl. Vasc. Gen. 401, II. 304 (1842).

823 *Alepyrum* Hook. f. apud Hieron. in Abh. Naturf. Ges. Halle, XII. 217 (1873)

versus

Alepyrum R. Br., Prodr. 252, 253 (1810).

Alepyrum Hieron. Centrolepidaceae.

Adopted by Engl. & Prantl, Nat. Pflanzenfam, II. -4, p. 16 (1888); ed. 2, XV^a. 32 (1930); Dalla Torre & Harms, Gen. Siph. 52, no. 823 (1900).—Three species in N. Zeal and, Auckland and Campbell Isl.

Standard species: *A. pallidum* Hook. f. Fl. N. Zeal. I. 268 (1853); the better known of the two original species.

Alepyrum R. Br., also belonging to Centrolepidaceae, was adopted by Roem. & Schult. Syst. I. 7, 44 (1817); Sprengel, Syst. I. 23 (1825); Desvaux in Ann. Sci. Nat. XIII. 42 (1828); Endl. Gen. 120 (1837), also by Hook. f. Fl. N. Zeal. I. 268 (1853), including *A. pallidum* Hook. f., the type of *Alepyrum* Hieron.; and in Hook. f., Fl. Tasman. II. 77 (1860). By Hieronymus and later authors it was referred to *Centrolepis*, while *Alepyrum* Hieron. is referred to *Gaimardia* by most recent authors.

In view of the fact that *Alepyrum* Hieron. is not a new name, but a name shifted to a genus typified by a species added later, excluding all the species of the original genus, it seems advisable to drop the name *Alepyrum* Hieron. and adopt *Pseudalepyrum* Dandy (in Jour. Bot. LXX. 331. 1932) as done by Lemée, Dict. Pl. Phan. V. 579 (1934), if the genus in the sense of Hieronymus is to be considered distinct. It is not a genus of wide distribution or economic importance and by most recent authors the species of *Alepyrum* Hieron. are referred to *Gaimardia* (*G. pallida* Hook. f., *G. ciliata* Hook. f., *G. minima* T. Kirk), also by Cheeseman, who says (Man. N. Zeal. Fl. ed. 2, 288. 1925) in referring to these species: "in the 'Pflanzenfamilien' Hieronymus keeps up the genus *Alepyrum* for their reception, a course which is likely to lead to confusion seeing that not one of the species which R. Brown placed in the original genus *Alepyrum*, is retained in it by Hieronymus." See also Benth. Fl. Austr. VII. 203 (1878).

1328 *Alpinia* Roxb. in As. Research. XI. 350 (1810)

versus

Alpinia Linnaeus, Sp. Pl. 2 (1753) and
Languas Koenig in Retz. Observ. III. 64 (1783).

Alpinia Roxb. Zingiberaceae.

Adopted by: Roxb. Fl. Ind. I. 58 (1820); Blume, Enum. Pl. Jav. I. 58 (1830); Endl. Gen. 224 (1837); Miquel, Fl. Ind. Bat. III. 60 (1858); Benth. Fl. Austr. VI. 264 (1873); Benth. & Hook. f. Gen. III. 648 (1883); Engl. & Prantl, Nat. Pflan-

zenfam. II.-6, p. 23 (1889); ed. 2, XV^a. 611 (1930); Hook. f. Fl. Brit. Ind. VI. 252 (1892); Dalla Torre & Harms, Gen. Siph. 25, no. 1328 (1900); Hemsl. in Jour. Linn. Soc. XXXVI. 71 (1903); Lecomte, Fl. Gén. Indo-Chine, VI. 85 (1908); Ridley, Fl. Malay Pen. IV. 277 (1924); Lemée, Dict. Pl. Phan. I. 172 (1929).—40 species in trop. and subtropic Asia and Australia.

Standard species: *A. galanga* (L.) Willd. Spec. I. 12 (1797) (*Maranta galanga* L. Spec. ed. 2, p. 3, 1762).

Alpinia L. (1753) also belonging to Zingiberaceae was based by Linnaeus on *A. racemosa*, an American species, but later Asiatic species were referred to the genus and the name was used by Roxburgh and most later authors exclusively for the Asiatic species which constitute a different genus, while the American species were placed under *Renealmia* L. f. Suppl. 7 (1781), and by almost all later authors the latter name based on *R. exaltata* L. f., which is congeneric with *A. racemosa*, was adopted for the American species. In 1922 however, Merrill (Enum. Philip. Fl. Pl. I. 230) showed that *Alpinia* L. is the proper name for the American species and took up the name *Languas* Koenig apud Retz. (1783) for *Alpinia* Roxb. In this he was followed by Britton & Wilson (Bot. Porto Rico, V. 172. 1924) who used *Languas* for the Asiatic and *Alpinia* L. for the American species. As this transfer would cause confusion, *Renealmia* was proposed as a nomen conservandum (in Rec. Syn. 1930, p. 100 and in Prop. Brit. Bot. 66) and has been accepted as such (Int. Rules, ed. 3, 132. 1935). This was done with the intention of making possible the continued use of *Alpinia* Roxb. for the Asiatic species, but on account of the new homonym rule, the older name *Alpinia* L. invalidates the more recent homonym *Alpinia* Roxb. which would be replaced by *Languas* Koenig if not conserved. It therefore seems to be highly desirable to conserve *Alpinia* in the sense of Roxburgh to avoid a change of name of this large and also economically important genus, as recommended also by Loesener in Engl. & Prantl, Nat. Pflanzenfam. ed. 2, XV^a. 611 (1930).

6583 *Alstonia* R. Br. in Mem. Werner. Soc. I. 75 (1809)

versus

Alstonia Scop. Introd. 198 (1777).

Alstonia Mutis apud L. f. Suppl. 39 (1781).

Alstonia R. Br. Apocynaceae.

Adopted by: Roem. & Schult. Syst. IV. p. xxxv, 415 (1819); Bl. Bijdr. XVI. 1036 (1826); Endl. Gen. 583 (1838); DC. Prodr. VIII. 408 (1844); Miq. Fl. Ind. Bat. II. 436 (1856); Benth. & Hook. f. Gen. II. 705 (1876); Hook. f. Fl. Brit. Ind. III. 641 (1882); Engl. & Prantl, Nat. Pflanzenfam. IV.-2, p. 138 (1895); Dalla Torre & Harms, Gen. 406, no. 6583 (1904);

Ridley, Fl. Malay. Pen. II. 345 (1923); Lemée, Dict. Pl. Phan. I. 176 (1929); Lecomte, Fl. Gén. Indo-Chine, III. 1161 (1933).—About 30 species in Indo-Malaya, trop. Australia and Africa.

Standard species: *A. scholaris* (L.) R. Br., l. c. (*Echites scholaris* L. Mant. 53 [1767]).

Alstonia Scop. belonging also to the Apocynaceae does not seem to have been taken up by any author except Necker, Elem. II. 54 (1790) and has never received any specific name. It is a synonym of *Landolphia* Beauv. which is a conserved name with *Alstonia* Scop. as one of the nomina rejicienda (see Règl. Internat. Congr. 1910, p. 97. 1912).

Alstonia Mutis belonging to the Symplocaceae was mentioned only by a few early authors. In 1832 it was referred as a section to *Symplocos* Jacq. (1760) by G. Don (Gen. Syst. IV. 1) and has never been recognized by any later author as a distinct genus.

In view of the universal acceptance of *Alstonia* R. Br. it is highly desirable to conserve the name for this large and widely distributed genus against the two homonyms which for more than a hundred years have figured only as synonyms. If not conserved, *Pala* Juss. (in Ann. Mus. Paris, XV. 346. 1810) which was published without species and has never been adopted by any author, would have to take its place. It was based on *Pala* Rheede tot Drakenstein, Hort. Ind. Malabar. I. t. 45, which is identical with *Alstonia scholaris*. The next oldest synonym is *Blaberopus* DC. which was separated by him (Prodr. VIII. 410. 1844) from *Alstonia* R. Br. and contains one of the original species (*A. venenata* R. Br.), but by most authors this genus is considered a section or a synonym of *Alstonia* R. Br.

7346 *Alvesia* Welwitsch in Trans. Linn. Soc. XXVII. 55 (1869)

versus

Alvesia Welwitsch, Apont. 587, no. 47 (1859).

Alvesia Welw. (1869). Labiatae.

Adopted by: Benth. & Hook. f. Gen. II. 1176 (1876); Engl. Hochgebirgsfl. Trop. Afr. 362 (1892); Engl. & Prantl, Nat. Pflanzenfam. IV.-3A, p. 350 (1897); De Wildem. & Durand, Ill. Fl. Congo, I. t. 42 (1899); Thiselton-Dyer, Fl. Trop. Afr. V. 378 (1900); Dalla Torre & Harms, Gen. 446, no. 7346 (1904); Lemée, Dict. Pl. Phan. I. 181 (1929).—One species in Trop. Afr.

Standard species: *A. rosmarinifolia* Welw. l. c.

Alvesia Welw. (1859) belonging to the Leguminosae is a synonym of *Bauhinia*, its type species, *A. bauhinoides* Welw. being identical with *B. tomentosa* L.; it was never recognized as a distinct genus by any author.

Considering the fact that *Alvesia* Welw. (1869) is universally recognized and that there is no synonym to take its place, it is desirable to conserve the name, otherwise a new name would have to be created.

6754 *Amblystigma* Benth. in Benth. & Hook. f. Gen. II. 748 (1876)
versus
Amblystigma Raf. Fl. Tell. II. 26 (1836) corr. Ktze., "*Amblostima* Raf."

There is apparently no need to conserve *Amblystigma* Benth. against Rafinesque's name, since Rafinesque published his name as *Amblostima*, which is an entirely different spelling and can hardly be considered a homonym, but Kuntze in 1904 (in Post & Ktze. Lex. 22, 23, corrected Rafinesque's name to *Amblystigma* and proposed the name *Stigmamblys* (l.c. 537) for *Amblystigma* Benth. *Stigmamblys* apparently has not been taken up by any author.

2412 *Anacampseros* Sims, Bot. Mag. XXXIII. t. 1367 (1811)
versus
Anacampseros Mill. Gard. Dict. Abridg. ed. 4 (1754).
Rülingia Ehrhart, Beitr. III. 132 (1788).
Telephiastrum Medikus, Phil. Bot. I. 100 (1789).

Anacampseros Sims. Portulacacæae.
Adopted by: DC. Cat. Hort. Monsp. 77 (1813); DC. Prodr. III. 355 (1928); Endlicher, Gen. II. n. 5176, p. 950 (1839); Harv. & Sond. Fl. Cap. II. 382 (1861-62); Benth. & Hook. f. Gen. Pl. I. 157 (1862); Engl. & Prantl, Pflanzenfam. III. 1b. 57 (1889); Dalla Torre & Harms, Gen. Siphonog. 155, no. 2412 (1900); Schinz in Bull. Herb. Boiss. sér. 2, I. 873 (1901); Schönland in Rec. Albany Mus. I. 50 (1903); N. E. Br. in Kew Bull. 1914, 132; J. M. Black in Trans. & Proc. Roy. Soc. S. Austral. XLI. 44 (1917), et Fl. S. Austr. 228 (1924); Dinter in Fedde, Repert. XIX. 149 (1923); Lemée, Dict. Pl. Phan. I. 228 (1929).—About 15 species from South Africa and one from Australia.

Standard species: *A. filamentosa* (Haw.) Sims, the first of the two original species described and figured by Sims.

Anacampseros Miller, belonging to the Crassulaceae, has been adopted by very few: Adanson, Fam. II. 248 (1763); Haworth, Synops. (1812); Jordan & Fourreau, Ic. Fl. Eur. I. tt. 81-100 (1867); Charbonnel in Bull. Soc. Bot. France, LX. (1913) Sess. Extr. p. cxcix (1920). The species belonging to this genus are usually included in the genus *Sedum*, as also by Berger in Engler & Prantl, Nat. Pflanzenfam. ed. 2, XVIIIa. 436 (1930).

Anacampseros P. Browne, Jamaica, 234 (1756) is not a legitimate generic name, since it lacks a generic description; it consists of two species, the first being probably *Talinum paniculatum* (Jacq.) Gaertn. and the second *Portulaca pilosa* L. (vide Fawcett and

Rendle, Fl. Jam. III. 170, 1914). The second species is marked by P. Browne with a question mark which would indicate that the first species is the type of the genus.

Rülingia Ehrh. was based on three species of which the first, *R. Anacampseros*, should be considered the type of the genus and was retained in *Rülingia* by Haworth (Synops. 124. 1812), while *R. triangularis* and *R. patens* were transferred by him to *Talinum*. He refers *Anacampseros* Sims to *Rülingia* and maintains *Anacampseros* Mill. as a distinct genus.

Telephiastrum [Dillenius, Hort. Elth. 375, t. 281] Med. is based on *Portulaca Anacampseros* L., but no formal generic description is given and no species enumerated; it has not been taken up by any botanist except as a subgenus of *Anacampseros* by Fenzl (in Ann. Wien. Mus. II. 296. 1839).

In view of the universal acceptance of *Anacampseros* Sims as a genus of Portulacaceae and of its importance in horticulture, it is highly desirable to conserve this name against *Anacampseros* Mill. and the two older synonyms. If not conserved, *Telephiastrum* would be the only available name and this is not validly published. The name *Rulingia*, (or *Rülingia*, also *Ruelingia*, both genera named for Joh. Philipp Rüling) should be conserved for *Rulingia* R. Br. (in Bot. Mag. XLVIII. t. 2129. 1820) the universally accepted name for a genus of Sterculiaceae of about 15 species.

4948 *Ancistrocarpus* Oliv. in Jour. Linn. Soc. IX. 173 (1867)
versus
Ancistrocarpus H. B. K. Nov. Gen. Spec. II. 186 (1817).

Ancistrocarpus Oliv. (1867). Tiliaceae.
Adopted by: Benth. & Hook. f. Gen. I. 986 (1867); Oliver, Fl. Trop. Afr. I. 265 (1868); Engl. & Prantl, Nat. Pflanzenfam. III.-6, p. 17 (1890); Dalla Torre & Harms, Gen. 305, no. 4948 (1901); Hutch. & Dalziel, Fl. W. Trop. Afr. I. 240 (1927); Lemée, Dict. Pl. Phan. I. 242 (1929).—Two species in trop. W. Afr.

Standard species: *A. brevispinosus* Oliv. l. c., the better known and more widely distributed of the two original species.

Ancistrocarpus H. B. K. (1817) belonging to the Phytolaccaceae, has been adopted by very few, as Kunth, Syn. I. 473 (1822), and Reichenb. Consp. 165 (1828) and Handb. 239 (1837), and is generally considered a synonym of *Microtea* Sw. (1788).

In view of the fact that *Ancistrocarpus* Oliv. has been universally accepted, while *Ancistrocarpus* H. B. K. is a synonym of *Microtea* Sw., it is desirable to conserve *Ancistrocarpus* Oliv. If not conserved *Acrosepalum* Pierre in Bull. Soc. Linn. Paris, n. ser., no. 1,

p. 22, no. 14, p. 119 (1898-99) would have to take its place; the only species of *Acrosepalum* is *A. Klaineianum* Pierre, l. c., which is a synonym of *Ancistrocarpus densispinosus* Oliv.

2921 **Andrzeiowskia** Reichb. Icon. Pl. Crit. I. 15, t. 13. 1823 (*Andreoskia* Reichb. apud Spach, Hist. Vég. VI. 323. 1838 (nomen); Boiss. Fl. Or. I. 363. 1867); non *Andreoskia* DC. Prodr. I. 190 (1824).—Cruciferae.

Since the name *Andreoskia* DC. (1824) is only an orthographic variant of the name *Andrzeiowskia* Reichb. (1823), both genera being named in honor of A. Andrzeiowski, the conservation against *Andreoskia* DC. of *Dontostemon* Andr. ex DC. Prodr. I. 190 (1824), pro syn.; Ledeb. Fl. Alt. III. 4, 114 (1831), as proposed in Prop. Brit. Bot. 75 and in Rec. Syn. 1930, p. 102, seems unnecessary, because *Andreoskia* DC. is a later homonym and therefore illegitimate. *Dontostemon* Andr. as the next oldest name is the valid name for *Andreoskia* DC. without being made a nomen conservandum, and has been already accepted by most authors (cf. Prop. Brit. Bot. 75, 1929). *Hesperidopsis* taken up by Kuntze (Rev. Gen. I. 30 [1891]) as the name for this genus, was published by DC. in 1821 as a section of *Sisymbrium*.

Andrzeiowskia Reichb. (1823) is the correct name for the monotypic genus based on *Notoceras cardaminefolium* DC. (1821) and has been generally adopted: Meisn. Gen. 10 (1837); Endl. Gen. 863 (1839); Spach in Orb. Dict. 7. 491 (1841); Griseb. Fl. Rum. I. 254 (1843); Lindl. Veg. Kingd. 354 (1847); Benth. & Hook. f. Gen. Pl. I. 70 (1862); Hayek, Prodr. Fl. Pen. Balc. 463 (1925) "*Andrzeiowskia*"; Lemée, Dict. Pl. Phan. I. 257 (1929). The orthographic variant *Andreoskia* Spach seems to have been adopted only by Boissier, Fl. Or. I. 363 (1807); Prantl in Engl. & Prantl, Nat. Pflanzenfam. III. 2, p. 170 (1891) and Dalla Torre & Harms, Gen. 184, 610, no. 2921 (1901). The only species is *A. cardaminefolia* (DC.) Prantl, l. c., sub *Andreoskia* (*A. Cardamine* Reichb.).

974 **Anguillaria** R. Br. Prodr. 273 (1810)

versus

Anguillaria Gaertn. Fruct. I. 372 (1788).

Anguillaria R. Br. Liliaceae.

Adopted by: Spreng. Syst. II. 146 (1825); Roem. & Schult. Syst. VII. p. xcix, 1538 (1830); Endl. Gen. 136 (1837); Hook. Fl. Tasman. II. 46 (1860); F. v. Muell. Fragm. Phyt. Austr. VII. 75 (1870); Benth. Fl. Austr. VII. 29 (1878); Benth. & Hook. f. Gen. III. 824 (1883); Engl. & Prantl, Nat. Pflanzenf.

II.-5, p. 28 (1888); ed. 2, XV^a 272 (1930); Dalla Torre & Harms, Gen. 61, 594, no. 974 (1900); Bailey, Queensl. Fl. V. 1641 (1902); Black, Fl. S. Austr. 106 (1922); Lemée, Dict. Pl. Phan. I. 269 (1929); Ewart, Fl. Victoria, 285 (1930).—Two species in Australia and Tasmania.

Standard species: *A. dioeca* R. Br. l. c., that of the four original species which was retained in the genus by Bentham (l. c.), who reduced two of the other species to synonymy, while the fourth, *A. indica* (L.) R. Br., was referred by Kunth, Enum. Pl. IV. 212 (1843) to his genus *Iphigenia*.

Anguillaria Gaertn. belonging to the Myrsinaceae was adopted only by some early authors as Schreber, Gen. 137 (1789); Lam. Tabl. Encycl. Méth. II. 109 (1793); Cavanilles, Icon. VI. 1, pl. 502-3 (1801). Poir. Encycl. Méth. VII. 684 (1806). It was later merged into *Ardisia* Sw., but in 1841 one of Gaertner's species was recognized by DC. in Ann. Sci. Nat. ser. 2, XVI. 79 as a distinct genus *Heberdenia* Banks apud DC., which was made a nomen conservandum in 1910 (Règl. Internat. 96, no. 6288, 1912).

Considering the fact that *Anguillaria* R. Br. is recognized by almost all modern authors, while *Anguillaria* Gaertn. has become a synonym of *Heberdenia* Banks apud DC. which is a conserved name, it is advisable to conserve *Anguillaria* R. Br. If not conserved, the name of the genus will become *Anguillaraea* Post & Ktze. Lex. Gen. Phan. 276 (1903) which does not seem to have been taken up by any subsequent author, though that name may be considered a simple orthographic variant of *Anguillaria* (see art. A. 57 of the new rules).

5155 **Anneslea** Wall. Pl. As. Rar. I. 5 (1829)

versus

Anneslia Hook. in Salisb. Parad. Lond. t. 64 (1807).

Anneslea Roxb. apud. Andr. Bot. Rep. X. t. 618 (1810).

Anneslea Wall. Theaceae.

Adopted by: Spreng. Gen. 422 (1830); G. Don, Gen. Syst. I. 565 (1831); Meisn. Gen. 40 (1837); Endl. Gen. 1018 (1840); Spach in Orbigny, Dict. I. 546 (1841) "*Annesleia*"; Benth. & Hook. f. Gen. I. 182 (1862); Hook. f. Fl. Brit. Ind. I. 280 (1874); Kurz, For. Fl. Burma, I. 98 (1877); Dalla Torre & Harms, Gen. Siph. 318, no. 5155 (1901); Post & Ktze. Lex. Gen. Phan. 32 (1904) "*Annesleya*"; Brandis, Ind. Trees, 58 (1906); Lecomte, Fl. Gén. Indo-Chine, I. 335 (1910); Melchior in Engl. & Prantl, Nat. Pflanzenfam. ed. 2, XXI. 143 (1925); Lemée, Dict. Pl. Phan. I. 283 (1929).—Two species in India and Malaya.

Standard species: *A. fragrans* Wall., the original species.

Synon.: *Richtera* Reichb. Rep. Herb. 208 (1841), nomen.

Callosmia C. Presl in Abh. Boehm. Ges. Wiss. ser. 5, III. 533 (Bot. Bemerk. 103) (1844).

Daydonia Britten in Jour. Bot. XXVI. 11 (1888).

Mountnorrisia Szysz. in Engl. & Prantl, Nat. Pflanzenf. III.-6, p. 189 (1893).

Anneslia Salisb. Parad. Lond. t. 64 (1807) "*Anneslea*" sub tab. belonging to the Leguminosae, was made a subgenus of *Inga* by G. Don, Gen. Syst. II. 396 (1832) as *Annesleya*, and appears in Steudel's Nomencl. ed. 2, p. 99 (1841) as *Annesleia*. It has not been adopted in any important work, and was rejected in favor of the generally accepted later name *Calliandra* Benth. in Hook. Jour. Bot. II. 138, (1840) which was made a nomen conservandum in 1910 (Règl. Internat. 88, no. 3444. 1912).

Anneslea Roxb. ap. Andrews is a later homonym and also a later synonym of *Euryale* Salisb. (1806) and therefore not a valid name.

In view of the fact that the name *Anneslea* Wall. has been adopted in all important publications except Engler & Prantl, ed. 1, and that the next oldest name, *Callosmia* Presl, has not been taken up by anyone, it seems advisable to conserve the name, though the genus is small and of no economic importance. *Daydonia* Britten is the third synonym of *Anneslea* Wall., though Britten when proposing the name says (l. c.) "for *Anneslea* Wall. is in the rare position of never having received another generic appellation." *Mountnorrisia* Szysz. does not seem to have been taken up by any author.

1904 *Aphananthe* Planch. in Ann. Sci. Nat. sér. 3, X. 265, 337 (1848)

versus

Aphananthe Lk. Enum. Hort. Berol. I. 383 (1821).

Aphananthe Planch. Ulmaceae.

Adopted by: Walp. Ann. Bot. III. 407 (1853); Miquel, Fl. Ind. Bat. I. 2, p. 219 (1859); DC. Prodr. XVII. 207 (1873); Benth. Fl. Austr. VI. 159 (1873); Franch. & Sav. Enum. Pl. Jap. I. 432 (1875); Benth. & Hook. f. Gen. III. 355 (1880); Engl. & Prantl, Nat. Pflanzenfam. III.-1, p. 66 (1888); Hemsl. in Jour. Linn. Soc. XXVI. 452 (1894); Dalla Torre & Harms, Gen. 119, no. 1904 (1900); Bailey, Queensl. Fl. V. 1462 (1902); Merrill, Enum. Philipp. Pl. II. 34 (1923); Lecomte, Fl. Gén. Indo-Chine, V. 690 (1928); Lemée, Dict. Pl. Phan. I. 326 (1929).—Three species in Eastern Asia, Philippine Islands and Australia.

Standard species: *A. philippinensis* Planch. l. c., the original species.

Synon.:

Homoioceltis Bl. Mus. Bot. Lugd.-Bat. II. 64, t. 34 (1852).

Aphananthe Lk., belonging to the Phytolaccaceae, is a synonym of the older *Microtea* Sw. (1788) and apparently has not been adopted by any author.

Considering the fact that *Aphananthe* Planch. has been almost universally adopted, while *Aphananthe* Lk. has not been recognized by any author, the former name should be conserved. If not conserved, the name of the genus would become *Homoioceltis* with the type species *H. aspera* Bl.; this generic name apparently was adopted only by Maximowicz in Bull. Acad. Sci. St. Pétersb. XVIII. 295 (1873).

3874 *Apios* Medik. in Vorles. Churpf. Phys.-ökon. Ges. II. 573 (1787)

versus

Glycine L. Gen. ed. 5, 334 (1754); L. Spec. 753 (1753) p.p., quoad spec. 1.

Bradlea Adans. Fam. II. 324 (1763), quoad *Apios* Corn.

Apios Medik. Leguminosae.

Adopted by: Moench, Meth. 165 (1794); Nutt. Gen. II. 113 (1818); DC. Prodr. II. 390 (1825); Spreng. Syst. III. 310 (1826); G. Don, Gen. Syst. II. 349 (1832); Torr. & Gray, N. Am. Fl. I. 282 (1838); Endl. Gen. Pl. 1296 (1841); Gray, Man. 95 (1848); Benth. & Hook. f. Gen. I. 532 (1865); Maxim. in Bull. Acad. Sci. St. Pétersb. XVII. 396 (1873); Hook. f. Fl. Brit. Ind. II. 188 (1876); Hemsl. in Jour. Linn. Soc. XXVI. 189 (1887); Engl. & Prantl, Nat. Pflanzenf. III.-3, p. 365 (1894); Britt. & Brown, Ill. Fl. N. States, II. 334 (1897); Robinson in Bot. Gaz. XXV. 450 (1898); Britton, Man. 569 (1901); Dalla Torre & Harms, Gen. 243, 615, no. 3874 (1901); Small, Fl. S. E. St. 652 (1903); Rydb. Rocky Mt. Fl. 529, (1917); Lecomte, Fl. Gén. Indo-Chine, II. 421 (1916); Lemée, Dict. Pl. Phan. I. 336 (1929).—Five species in N. Am., E. Asia and India.

Standard species: *A. americana* Medik. (l.c.), the original species. (= *A. tuberosa* Moench, 1794).

Glycine L. is based on *Apios* Boerh. (1720) which is synonymous with *Apios* Medik., and the first species, *G. Apios*, is synonymous with *Apios americana* Medik., but in this sense the genus was adopted only by Post & Ktze. Lex. Gen. Phan. 251 (1904), by Britton in Britt. & Brown, Ill. N. St. ed. 2, II. 418 (1913), and by Small, Fl. S. E. St. 723 (1933). In the list of Standard-species of Linnaean genera proposed to the International Botani-

cal Congress at Cambridge, *G. javanica* is named as the Standard-species (Propos. Brit. Bot. 176. 1929) and this proposition will probably be accepted.

Bradlea Adans. includes the genera *Apios* Med., *Wisteria* Nutt. and *Glycine* L., by most authors it has been considered a synonym of *Apios*, as by: DC. Prodr. II. 390 (1825); Pfeiffer, Nomencl. I. 233, 461 (1873); Jackson, Ind. Kew. I. 161 (1893); Robinson in Bot. Gaz. XXV. 452 (1898); Dalla Torre & Harms, Gen. 243 (1901). By two authors, however, by Britton, Man. 549 (1901) as *Bradleya*, and by Small, Fl. S. E. St. 612 (1903) as *Bradleia*, the genus was considered the oldest name for *Wisteria* Nutt., though Britton in Britton & Brown, Ill. Fl. N. St. II. 293 (1897); ed. 2, II. 373 (1913) uses *Kraunhia* Raf. as the oldest name for that genus. The genus *Bradlea* Adans. has three later homonyms, all orthographic variants of the name: *Bradlaeia* Neck. (1790)=*Siler* Scop. (1772); *Bradleia* Banks ap. Gaertn. (1791)=*Glochidion* Forst. (1776) and *Braddleya* Vellozo (1825)=*Amphirrhox* Spreng. (1827) which is a nomen conservandum (Règl. Internat. 94, no. 5259. 1912).

In view of the fact that *Apios* Moench is almost universally recognized, while both *Glycine* L. p.p. and *Bradlea* have been adopted by only a few authors, the conservation of *Apios* Medik. is strongly recommended.

3532 *Apuleja* Mart. Herb. Fl. Bras. 123 (in Flora, Beibl. 1837, II) (1837)

versus

Apuleja Gaertn. Fruct. II. 439 (1791).

Apuleja Mart. Leguminosae.

Adopted as *Apuleia* by: Benth. in Hook. Jour. Bot. II. 74 (1840); Endl. Gen. 1311 (1841); Spach in Orbigny, Dict. II. 47 (1842); Benth. & Hook. f. Gen. I. 574 (1865); Benth. in Mart. Fl. Bras. XV. 2, p. 176 (1870); Engl. & Prantl, Nat. Pflanzenfam. III. 3, p. 156 (1892); Dalla Torre & Harms, Gen. Phan. 218, no. 3532 (1901); Lemée, Dict. Pl. Phan. I. 352 (1929).—Two species in Brazil and Peru.

Standard species: *A. praecox* Mart. l. c.=*A. leiocarpa* (Vogel) Macbr. in Contr. Gray Herb. LIX. 23 (1919), the original species.

Apuleja Gaertn. belonging to the Compositae was adopted only by a few early botanists as Juss. in Dict. Sci. Nat. II. 307 (1804); in Ann. Mus. Paris, VIII. 178 (1806); Lessing, Syn. 63 (1832). It is a synonym of the older *Berkheya* Ehrh. (1788) which is a generally accepted generic name.

Considering the fact that *Apuleja* Mart. is generally recognized, while *Apuleja* Gaertn. is a synonym of the earlier *Berkheya* Ehrh.

it seems advisable to conserve *Apuleja* Mart. with the accepted spelling *Apuleia*, since i and j in Latin do not constitute different letters, though of different sound. *Zenkeria* Arn. in Mag. Zool. Bot. II. 548 (1838), an older synonym of *Apuleia* Gaertn., is a later homonym of *Zenkeria* Trin. (1837), a generally recognized genus of Gramineae. If not conserved, *Apuleia* Mart. will become *Apoleya* Gleason in Phytologia I. 143 (1935), with the standard-species *A. leiocarpa* (Vogel) Gleason, l. c.

1386 *Arachnitis* Philippi in Bot. Zeit. XXII. 217 (1864)

versus

Arachnites F. W. Schmidt, Fl. Böhm. I. 74 (1793).

Arachnitis Phil. Burmanniaceae.

Adopted by: Phil. in Anal. Univ. Chile, 1865, p. 639; in Verh. Zool. Bot. Ges. Wien, XV. 517, t. 12 (1865) "*Arachnites*"; Philippi f. Cat. Pl. Vasc. Chile, 278 (1881); Benth. & Hook. f. Gen. III. 460 (1883) "*Arachnites*"; Engl. & Prantl, Nat. Pflanzenfam. II.-6, p. 51 (1889) "*Arachnites*"; Dalla Torre & Harms, Gen. 88, no. 1386 (1900); Skottsberg in Svensk Vetensk. Handl. LVI. no. 5, p. 193 (1916) "*Arachnites*"; Hauman & Vanderveken, Cat. Phan. Argentina, I. 306 (1917); Lemée, Dict. Pl. Phan. I. 356 (1929).—One species from Chile to Argentine.

Standard species: *A. uniflora* Phil., l. c., the original species.

Arachnites F. W. Schmidt belonging to the Orchidaceae was adopted by only few early authors as: G. F. Hoffmann, Deutschl. Fl. ed. 2, II. 179 (1804); Todaro, Orch. Sicul. 77 (1842), Hort. Bot. Panorm. II. 14, t. 28 (1879). By all other authors it has been referred as a synonym to *Ophrys* L. *Arachnites* has also been used as the name of a section under *Hypochaeris* by DC. Prodr. VII. I, p. 90 (1838) and "*Arachnitis* Blum." appears as a synonym of sect. *Arachnanthe* (Bl.) of *Renanthera* Lour. in Endl. Gen. Suppl. III. 61 (1843).

Considering the fact that *Arachnitis* Phil. has been universally accepted, and that there is no synonym to take its place, it is advisable to conserve the name against *Arachnites* F. W. Schmidt, which was accepted by only few, and is generally considered a synonym of *Ophrys* L. The two names *Arachnitis* and *Arachnites* must be considered orthographic variants and both spellings have been used by different authors for *Arachnitis* Phil.

4073 **Araliopsis** Engl. in Engl. & Prantl, Nat. Pflanzenfam. III.-4, p. 175 (1896)

versus

Araliopsis Kurz in Andaman Rep. 39 (1870).

Araliopsis Lesq. (1878?). Fossil plant.

Araliopsis Engler. Rutaceae.

Adopted by: Dalla Torre & Harms, Gen. 255, no. 4073 (1901); Engler & Drude, Veget. Erde, IX. III. 1, p. 752 (1915); Verdoorn in Kew Bull. 1926, p. 393; Lemée, Dict. Pl. Phan. I. 358 (1929).

—One species in Gabon.

Standard species: *A. Soyauxii* Engl. l. c., the original species.

Araliopsis Kurz belonging to the Araliaceae, with the only species *A. andamanica* Kurz, does not seem to have been adopted by any one. In Hook. f. Fl. Brit. Ind. II. 735 (1879) it was referred to *Brassaiopsis palmata* Kurz as a synonym.

Araliopsis Lesq. based on a fossil plant of doubtful affinity (Pteridophyta or Araliaceae) has two older synonyms: *Debeya* Miq. (1860) and *Araliophyton* Ettingsh. (1870).

Considering that *Araliopsis* Engl. has been adopted by subsequent authors and has no synonyms, while *Araliopsis* Kurz has been referred to *Brassaiopsis*, and *Araliopsis* Lesq. is invalidated by two older synonyms, it seems advisable to conserve *Araliopsis* Engl.

4927 **Aristotelia** L'Hérit. Stirp. Nov. 31, t. 16 (1784)

versus

Aristotela Adans. Fam. II. 125 (1763).

Aristotelia L'Hérit. Elaeocarpaceae.

Adopted by: Gmelin, Syst. 751 (1791) "*Aristotela*"; Ruiz & Pav. Prodr. 70, t. 12 (1794); Pers. Syn. II. 10 (1807); DC. Prodr. II. 56 (1825); Spreng. Syst. II. 450 (1825) and Gen. I. 393 (1830) "*Aristotelea*"; Endl. Gen. 1024 (1840); Gay, Hist. Chile, Bot. I. 335 (1845); Hook. f. Fl. N. Zeal. I. 33 (1853); Benth. & Hook. f. Gen. I. 237 (1862); Benth. Fl. Austral. I. 279 (1863); F. v. Muell. Fragm. Phytog. Austr. VIII. 2 (1872); Engl. & Prantl, Nat. Pflanzenf. III.-6, p. 8 (1890); Reiche, Fl. Chile, I. 267 (1896); F. M. Bailey, Queensl. Fl. I. 160 (1899); Dalla Torre & Harms, Gen. 304, no. 4927 (1901); Cheeseman, Man. N. Zeal. Fl. 83 (1906); Lemée, Dict. Pl. Phan. I. 358 (1929).—Seven species in Australia, New Zealand and Chile.

Standard species: *A. maqui* L., the original species.

Synonyms:

Friesia DC. Prodr. I. 520 (1824).

Beaumarea Deless. ex Steudel, Nom. ed. 2, I. 192 (1840), pro synon.

Aristotela Adans. belonging to the Compositae is a synonym of *Othonna* L.; it seems not to have been taken up by any author and has never received a specific epithet. There is also a later homonym *Aristotelea* Lour. Fl. Cochinch. 522 (1790) belonging to the Orchidaceae which is generally considered a synonym of *Spiranthes* Rich.

Considering the fact that *Aristotelia* L'Hérit. has been universally accepted, while *Aristotela* Adans. seems not to have been adopted by any author, and is referred as a synonym to the older *Othonna* L., the conservation of *Aristotelia* L'Hérit. is strongly recommended. If not conserved, the genus would have to receive a new name, for *Friesia* DC. is illegitimate, being a later homonym of *Friesia* Spreng. (1818), and *Beaumaria* Deless. was published only in synonymy.

3967 **Augea** Thunb. Prodr. Pl. Cap. 80 (1794)

versus

Augea Thunb. ex Retz. Observ. V. 3 (1789), nomen.

Augia Lour. Fl. Cochinch. 337 (1790).

Augea Thunb. Zygophyllaceae.

Adopted by: Willd. Spec. Pl. II. 630 (1799); Pers. Syn. I. 485 (1805); Thunb. Fl. Cap. ed. Schultes, 389 (1823); Spreng. Syst. II. 356 (1825); Endl. Gen. 1327 (1841); Harv. & Sond. Fl. Cap. I. 355 (1859); Benth. & Hook. Gen. I. 265 (1862); Engl. & Prantl, Nat. Pflanzenfam. III.-4, p. 92 (1890); Dalla Torre & Harms, Gen. 249, no. 3967 (1901); Marloth, Fl. S. Afr. II. 100 (1925); Lemée, Dict. Pl. Phan. I. 358 (1929).—One species in S. Africa.

Standard species: *A. capensis* Thunb., l. c., the original species.

Synon.: *Piotes teretifolia* Soland. mscr. apud Britt. in Jour. Bot. XXII. 147 (1884).

Augea Thunb. ex Retz. belonging to the Haemodoraceae, is a nomen nudum for *Hyacinthus lanatus* and apparently was not adopted by any author. It is universally considered a synonym of *Lanaria* Ait. (1789). Also another synonym, *Argolasia* Juss. (1789), seems not to have been adopted by any author. All three names were published in 1789, but the priority of any of these names has not yet been established.

Augia Lour. a genus of doubtful affinity probably belonging to the Anacardiaceae was mentioned as a genus dubium by only a few authors, as Endl. Gen. 1135 (1840) and Meisn. Pl. Vasc. Gen. II. 349 (1843). By Steud. Nomencl. I. 261 (1871) it was referred to *Calophyllum* as *C. Augia* Steud., but according to Merrill

(Comm. Lour. Fl. Cochinch. mscr.) it is a nomen confusum resting on fruits of *Rhus succedanea* L. and flowers of *Melanorrhoea* Wall. rather than of *Calophyllum*.

In view of the fact that *Augea* Thunb. is universally accepted, while *Augia* Lour. is a nomen confusum and *Augea* Thunb. ex Retz. a nomen nudum, the conservation of *Augea* Thunb. is recommended. If not conserved *Piotes* Soland. ap. Britten will take its place. The names *Augea* and *Augia* are so similar that they should be treated as orthographic variants, though of different origin; *Augea* Thunb. is named in honor of Andreas Auge, gardener and collector in S. Africa (see Thunb. Fl. Cap. ed. Schultes, p. vii), while *Augia* Lour. is derived from the Greek αὐγή, gleam, sheen.

8183 **Augusta** Pohl in Flora, XII. 118 (Feb. 1829)

versus

Augusta Leandro in Denkschr. Akad. Muench. VII. 235 (1819).

Augustia Klotzsch in Monatsb. Berlin Akad. März 1854, p. 124; Abh. Akad. Berlin 1854, p. 80.

Augusta Pohl. Rubiaceae.

Adopted by: Cham. & Schlecht. in Linnaea, IV. 181 (1829); DC. Prodr. IV. 404 (1830) "*Augustea*"; Pohl, Pl. Bras. Icon. II. 1, t. 101-5 (1831); G. Don, Gen. Syst. III. 513 (1834) "*Augustea*"; Meisn. Gen. 159, II. 114 (1838); Benth. & Hook. f. Gen. II. 51 (1873); Baillon, Hist. Pl. VII. 475 (1880); Dalla Torre & Harms, Gen. 493, no. 8183 (1905); Lemée, Dict. Pl. Phan. I. 359 (1929).—One species in Brazil.

Standard species: *A. longifolia* (Spreng.), comb. nov. (*Ucristana longifolia* Spreng., *A. lanceolata* Pohl), the original species.

Synon.:

Ucristana Spreng. Syst. I. 516, 761 (1825) p.p.; non Willd. Sp. Pl. I. 961 (1797).

Schreibersia Pohl in Flora, VIII. 183 (1825), nomen; Endl. Gen. 553 (1838); Steudel, Nom. ed. 2, II. 535 (1841), sphalmate *Schreiberia*.

Bonifacia Manse ex Steud. Nom. ed. 2, I. 216 (1840).

Augusta Leandro, belonging to the Compositae is a synonym of the conserved *Stiffia* Mik. (see Règles Intern. p. 103, no. 9490. 1912).

Augustia Klotzsch belonging to the Begoniaceae, if considered an orthographic variant of *Augusta* and *Augustea*, though of different derivation, is an illegitimate later homonym. It is generally referred to *Begonia* as a section and does not seem to have been adopted by any author as a genus.

Considering the fact that *Augusta* Pohl has been adopted by many authors and that *Augusta* Leandro is a nomen rejiciendum,

it seems advisable to conserve it. If not conserved, the name of the genus would be *Schreibersia* Pohl in Endl., Gen. (1838); Ktze, Rev. Gen. I. 298 (1891); Post & Ktze. Lex. 507 (1904) with the species *S. longifolia* (Spreng.) Ktze., l. c. The name *Ucristana* Spreng. which was taken up by Schumann in Fl. Brasil. VI. 6, p. 241 (1889) and in Engl. & Prantl, Nat. Pflanzenfam. IV. -4, p. 38 (1891) is a nomen confusum; it is cited by Sprengel as *Ucristana* W. and contains 5 species: the original species of *Ucristana* Willd. = *Totoyena* Aubl., one species belonging to *Augusta* Pohl, and three species to *Posoqueria latifolia* Roem. & Schult.

877 **Bakeria** André in Rev. Hort. 1889, p. 84

versus

Bakeria Seem. in Jour. Bot. II. 248 (1864).

Bakeria André. Bromeliaceae.

Adopted by: Baker, Handb. Bromel. 89 (1889); Baillon, Hist. Pl. XIII. 118 (1895); Mez in DC. Monog. Phan. IX. 343 (1896); Engl. & Prantl, Nat. Pflanzenfam. Nachtr. 67 (1877); ed. 2, XVa, 112 (1930); Dalla Torre & Harms, Gen. Siphon. 55, no. 877 (1900); Lemée, Dict. Pl. Phan. I. 485 (1929).—One species probably from Colombia.

Standard species: *B. tillandsioides* André, l. c., the original species.

Bakeria Seem. belonging to the Araliaceae was apparently not adopted by any author. It was referred in 1865 by Benth. & Hook. f. (Gen. I. 946) together with *Nesopanax* Seem. (l. c. 249) to *Plerandra*, and this disposition has been followed by all later authors.

Bakeria André has been renamed *Bakerantha* L. B. Smith in Contrib. Gray Herb. CIV. 72 (1934), because of *Bakeria* Seem. The acceptance of this name is to be recommended, since the genus is small and of no economic importance.

3932 **Balbisia** Cav. in Anal. Cienc. Nat. VIII. 62 (1804)

versus

Balbisia Willd. Spec. III. 2214 (1803).

Balbisia DC. in Guillem. Arch. Bot. II. 233 (1833); Prodr. VI. 447 (1837).

Balbisia Cav. Geraniaceae.

Adopted by: D. Don in Edinb. N. Phil. Jour. XI. 276 (1831); Klotzsch in Linnaea, X. 431 (1835); Meisn. Gen. 58, Comm. 42 (1837); Benth. & Hook. f. Gen. I. 276 (1862); Engl. & Prantl, Nat. Pflanzenfam. III.-4, p. 13 (1890); ed. 2, XIXa. p. 65 (1931); Reiche, Fl. Chile, I. 294 (1896); Dalla Torre & Harms, Gen. 247, no. 3932 (1901); Lemée, Dict. Pl. Phan. I. 490 (1929).—Six species in subtrop. S. America.

Standard species: *B. verticillata* Cav., l. c., the original species.

Balbisia Willd. Spec. III. 2214 (1803) belonging to the Compositae was recognized by only few earlier botanists, as Persoon, Syn. II. 470 (1807); Cassini in Dict. Sci. Nat. III. 169 (1816); H.B.K. Nov. Gen. IV. 252 (1820); Sprengel, Syst. III. 569 (1826). It is a synonym of *Tridax* L., the type species *B. elongata* Willd., being identical with *T. procumbens* L., the type species of *Tridax*.

There is a third homonym *Balbisia* DC. in Guillem. Arch. Bot. II. 233 (1833); Prodr. VI. 447 (1837) belonging also to the Compositae; it was adopted by only few authors, as Endl. Gen. 461 (1838); Cassini in Orbigny, Dict. II. 429 (1842); Lindl. Veg. Kingd. 713 (1847). It is usually referred to *Rhelinodendron* Meisn. (1837), but this is invalidated by the older homonym *Retinodendron* Zenker (1833) and if the former is not conserved the correct name for this genus would be *Vendredia* Baill. (1886).

In view of the fact that *Balbisia* Cav. has been adopted by many authors and in modern general works, its conservation may be considered desirable, but as it is a small genus of restricted distribution and of no economic importance, there is no strong reason to conserve it. If not conserved the next oldest synonym to take its place will be *Ledocarpum* Desf. in Mém. Mus. Paris, IV. 250 (1818) which was adopted by: DC. Prodr. I. 702 (1824) "*Ledocarpum*"; Sprengel, Syst. II. 432 (1825); G. Don, Gen. Syst. I. 768 (1831); Spach, Vég. Phan. III. 269 (1834); Endl. Gen. 1169 (1840) "*Ledocarpum*"; Gay, Hist. Chile, Bot. I. 392 (1845); Philippi f. Cat. Pl. Vasc. Chile, I. 34 (1881). The type species of *Ledocarpum* is *L. chiloense* Desf. which is identical with *B. verticillata* Cav.; the latter name containing the oldest specific epithet.

5195 **Balboa** Planch. & Triana in Ann. Sci. Nat. sér. 4, XIV. 252 (1860)
versus

Balboa Liebm. in Kjoeb. Vidensk. Meddel. 1853, p. 106 (Nov. Pl. Mex. Gen. Dec.) (1853).

Balboa Planch & Triana. Guttiferae.

Adopted by: Benth. & Hook. f. Gen. I. 172 (1862); Vesque, Epharm. t. 78 (1889), in DC. Monog. Phan. VIII. 167 (1893); Engl. & Prantl, Nat. Pflanzenfam. III.-6, p. 229 (1893); ed. 2, XXI. 208 (1925); Dalla Torre & Harms, Gen. 321, no. 5195 (1903); Lemée, Dict. Pl. Phan. I. 491 (1929).—One species in Colombia.

Standard species: *B. membranacea* Planch. & Triana, l. c., the original species.

Balboa Liebm. belonging to the Leguminosae does not seem to have been taken up by any author except in a reprint in Walper's Ann. Bot. IV. 550 (1857). The only species *B. diversifolia* Liebm., l. c., has been referred as a synonym to *Tephrosia madrensis* Seem. Bot. Voy. Herald, 280, t. 61 (1856); the original specific epithet, however, cannot be transferred to *Tephrosia*, since there is already a *T. diversifolia* (Rose) Macbride (1925).

In view of the fact that *Balboa* Planch. & Triana has no synonym to take its place, and that the earlier homonym has not been adopted by any author, it seems advisable to conserve it.

9241 **Balduina** Nutt. Gen. II. 175 (after May, 1818)
versus

Baldwinia Raf. in Am. Monthl. Mag. II. 267 (Feb., 1818), sine descript.
Mnesiteon Raf. Fl. Ludov. 67 (1817).

Balduina Nutt. Compositae.

Adopted by: Cassini in Dict. Sci. Nat. XX. 347 (1821); Elliott, Sketch Bot. S. Car. II. 447 (1824); Sprengel, Syst. III. 619 (1826); DC. Prodr. V. 653 (1836); Endl. Gen. 421 (1838); Meisn. Gen. 215, Com. 132 (1839); Torr. & Gray, Fl. N. Am. II. 388 (1841) "*Baldwinia*"; Chapm. Fl. S. U. S. 240 (1860) "*Baldwinia*"; Benth. & Hook. f. Gen. II. 391 (1873); Gray, Syn. Fl. N. Am. I. 2, p. 302 (1884) "*Baldwinia*"; Engl. & Prantl, Nat. Pflanzenfam. IV.-5, p. 246 (1890); Dalla Torre & Harms, Gen. 552, no. 9241 (1905); Robinson in Proc. Am. Acad. XLVII. 215 (1911); Lemée, Dict. Pl. Phan. I. 491 (1929) "*Baldwinia*."—Three species in the South Eastern U. S.

Standard species: *B. uniflora* Nutt., the first of the two original species, and that retained by Elliott when separating the second species as a distinct genus.

Baldwinia Raf. belonging to the Passifloraceae has not been adopted by any author. It was published without description only with the remark "*Passiflora peltata* must form the new genus *Baldwinia*"; it is therefore not validly published. *Balduina* and *Baldwinia* must be considered orthographic variants since they have been named for the same man and the latter spelling has been used by several authors for Nuttall's genus.

Mnesiteon Raf. was published with two species which have been tentatively identified with *Balduina multiflora* Nutt., a synonym of the type of *Actinospermum* Ell. which is kept as a distinct genus by many authors. *Mnesiteon* Raf., however, has never been taken up for *Actinospermum*, though it has priority; it is perhaps best listed as a nomen dubium.

In view of the fact that *Balduina* has been generally adopted, except by Small, it seems advisable to conserve it. Small (Fl.

S. E. U. S. 1283, 1340. 1903; Man. S. E. Fl. 1454. 1933) uses *Endorima* Raf. in Am. Monthl. Mag. IV. 195 (1819), a name proposed by Rafinesque for *Balduina* Nutt. on account of his earlier *Balduinia* which, however, was not validly published. *Mnesiteon* Raf. needs to be taken into consideration, only if *Balduina* is used in its original conception, that is, including *Actinospermum* Ell., as done by most authors.

2068 **Banksia** L. f. Suppl. 15 (1781)

versus

Banksia Forst. Char. Gen. 7, t. 4 (1776).

Banksia L. f. Proteaceae.

Adopted by: Murray, Syst. 161 (1784); Gmelin, Syst. 262 (1791); Willd. Spec. I. 535 (1797); Persoon, Syn. I. 116 (1805); R. Brown in Trans. Linn. Soc. X. 202 (1809); Prodr. I. 391 (1810); Roem. & Schult. Syst. III. 27, 436 (1818); Sprengel, Syst. I. 484 (1825); Endl. Gen. 343 (1838); Spach, Vég. Phan. X. 427 (1841); Meisn. in DC. Prodr. XIV. I, p. 451 (1856); Hook. f. Fl. Tasman. I. 328 (1860); F. v. Muell. Fragm. Phytog. Austr. VII. 54 (1869); Benth. Fl. Austr. V. 541 (1870); Benth. & Hook. f. Gen. III. 184 (1880); Engl. & Prantl, Nat. Pflanzenfam. III.-1, p. 151 (1889); Dalla Torre & Harms, Gen. 128, no. 2068 (1900); F. M. Bailey, Queensl. Fl. IV. 1358 (1901); Compr. Cat. Queensl. Pl. 455 (1909); Lemée, Dict. Pl. Phan. I. 499 (1929); Ewart, Pl. Victoria, 397 (1930).—Nearly 50 species in Australia.

Standard species: *B. serrata* L. f. op. cit. 126, one of the four original species and the only one of which the flowers are described, therefore it is apparently the type on which the generic description is based.

Banksia Forst. belonging to the Thymelaeaceae does not seem to have been adopted by any author except Scopoli (Introd. 345. 1777). It is a synonym of *Pimelea* Banks & Sol. (1788) which was made a nomen conservatum (Règl. Internat. 1912, p. 95).

There are also the following later homonyms: *Banksea* Koenig ap. Retz. Observ. III. 75 (1783) which is a synonym of *Costus* L.; *Bankesia* Bruce, Voy. Nub. Abyss. V. 91, t. 22, 23 (*Banksia* sub tab.) (1791) which is a synonym of *Hagenia* J. F. Gmel.; *Banksia* Domb. ex DC. Prodr. III. 83 (1828) which was published as a synonym of *Cuphea* P. Br.

Since *Banksia* L. f. has been almost universally accepted and represents a genus of nearly 50 species, also well-known in horticultural literature, it seems highly desirable to conserve it. If not conserved the name of the genus would become *Sirmuelleria* Ktze. Rev. Gen. II. 581 (1891), later merged by its author into *Dryandra*. *Isostylis* R. Br. (apud Spach, Vég. Phan. X. 402 [1841];

apud Steud. Nom. ed. 2, 829 [1840] as synonym.) was published by R. Brown as a section of *Banksia* and Spach enumerates it by name only as a genus intercalated between *Banksia* and *Dryandra*.

1032 **Bartlingia** F. v. Muell. in Pap. Roy. Soc. Tasmania, 1877, p. 116

versus

Bartlingia Reichenb. in Flora, VIII. 241 (1824).

Bartlingia Brongn. in Ann. Sci. Nat. sér. 1, X. 373 (1827).

Bartlingia F. v. Muell. Liliaceae.

Adopted by: F. v. Muell. Syst. Cens. I. 118 (1882); II. 200 (1889); Engl. & Prantl, Nat. Pflanzenfam. Nachtr. 73 (1897); Dalla Torre & Harms, Gen. 64, no. 1032 (1900); Post & Ktze. Lex. Gen. Phan. 61 (1904); Black, Fl. S. Austr. I. 110 (1922); Ewart, Fl. Victoria, 280 (1930); Lemée, Dict. Pl. Phan. II. 1029 (1930).—Eight species in Australia.

Standard species: *B. gracilis* (R. Br.) F. v. Muell. Syst. Cens. I. 118 (1882), the first and best known and most widely distributed of the two original species of *Laxmannia* R. Br. which was renamed by F. v. Muell. *Bartlingia*. In Index Kewensis the name *Bartlingia* F. v. Muell. is credited to Benth. Fl. Austr. VII. 63 (1878), but Bentham cites *Bartlingia* only as a synonym and recommends its rejection. Bentham's reference to F. v. Muell. Fragm. VII. 88 (1870) as the source of the name is misleading, since Mueller in that place only recommends the change of the preoccupied name *Laxmannia* R. Br. and the dedication of the genus to Fr. G. Bartling, but without coining the name *Bartlingia*.

Bartlingia Reichenb. in Flora, VII. 241 (1824) belonging to the Rubiaceae was enumerated by Sprengel, Syst. I. 747 (1825), but identified by him op. cit. Cur. Post. 50 (1827) with *Plocama* Ait.

Bartlingia Brongn. belonging to the Leguminosae was enumerated as a genus dubium of Myrtaceae by a number of authors as Reichenb. Consp. 176 (1828); G. Don, Gen. Syst. II. 39; Meisn. Gen. 107, Comm. 76 (1837); Endl. Gen. 1227 (1840); Schauer in Nov. Act. Leop.-Car. XIX. Suppl. II. 173 (1841); Lindl. Veg. Kingd. 721 (1847); but in 1865 it was referred by Benth. & Hook. f. Gen. Pl. I. 471 to *Pultenaea* Sm. and it was shown that its misleading description was based on a misinterpretation of the undeveloped flowers.

Bartlingia F. v. Muell. was proposed as a new name for *Laxmannia* R. Br. which was invalidated by the earlier *Laxmannia* Forst. (1776). Since the two earlier homonyms of *Bartlingia* F. v. Muell. are clear synonyms of two older genera, and since *Laxmannia*

R. Br. is a younger homonym, the conservation of *Bartlingia* may be advocated, though it would perhaps be more practical to conserve *Laxmannia* R. Br. and to continue to use for *Laxmannia* Forst. the name *Petrobium* R. Br. under which it is generally known.

Laxmannia R. Br. has been used by all authors up to 1877, and its use was continued by Benth. Fl. Austr. VII. 63 (1878); Benth. & Hook. f. Gen. III. 796 (1883); F. M. Bailey, Syn. Queensl. Pl. 552 (1883); Queensl. Fl. V. 1638 (1902); Compr. Cat. Queensl. Pl. 559 (1909); Engl. & Prantl, Nat. Pflanzenfam. II.-5, p. 48 (1888), while *Bartlingia* F. v. Muell. was taken up by the authors cited above.

Laxmannia Forst. Char. Gen. 94, t. 47 (1776) seems to have been adopted only by Scopoli, Introductio. 204 (1777) and by Post & Ktze. Lex. Gen. Phan. 319 (1904).

8350 **Baumannia** K. Schum in Bot. Jahrb. XXIII. 456 (1897)

versus

Baumannia DC. in Mém. Soc. Phys. Genève, IV. 583, t. 1 (Not. Pl. Rar. Jard. Genève, VI. i, t. 1, 25) (1833).

Baumannia Spach, Hist. Vég. Phan. IV. 351 (1835).

Baumannia K. Schum. Rubiaceae.

Adopted by: Engl. & Prantl, Nat. Pflanzenfam. Nachtr. 315 (1897); Post & Ktze. Lex. Phan. 62 (1904); Dalla Torre & Harms, Gen. Siphon. 500, no. 8350 (1905); Thonner, Flow. Pl. Afr. 518 (1915); Lemée, Dict. Pl. Phan. I. 527 (1929).—One species in trop. W. Afr.

Standard species: *B. hedyotoidea* K. Schum., l. c., the original species.

Baumannia DC. belonging also to the Rubiaceae was taken up by a few early authors as Meisn. Gen. 165, Comm. 117 (1838); Endl. Gen. 540 (1838); Spach, Vég. Phan. VIII. 375 (1839); Lindl. Veg. Kingd. 764 (1847), but in 1846 its type *B. geminiflora* was identified by Zuccarini in Gel. Anz. Akad. Wiss. Muench. XXII. 313, with *Damnacanthus indicus* L.

Baumannia Spach belonging to the Oenotheraceae seems not to have been adopted by any author; the name was changed by Spach himself in Nouv. Ann. Mus. Paris IV. 339 (1835) to *Anogra* on account of the earlier homonym *Baumannia* DC. The genus is by most authors included under *Oenothera* L.

In view of the fact that *Baumannia* K. Schum. has no synonym to take its place, and that the earlier homonyms are not valid, its conservation is recommended.

1044 **Baxteria** R. Br. ap. Hook. in Hook. Lond. Jour. II. 492 (1843)

versus

Baxteria Reichenb. Consp. 131 (1828).

Baxteria R. Br. Liliaceae.

Adopted by: Endl. in Lehm. Pl. Preiss. II. 51 (1847); Lindl. Veg. Kingd. 192 (1847); Steudel, Syn. Glum. II. 311 (1855); Benth. Fl. Austr. VII. 120 (1878); F. v. Muell. Syst. Cens. Austr. Pl. 119 (1882); Benth. & Hook. f. Gen. III. 866 (1883); Engl. & Prantl, Nat. Pflanzenfam. II.-5, p. 53 (1888); Dalla Torre & Harms, Gen. Siphon. 65, no. 1044 (1900); Post & Ktze. Lex. Gen. Phan. 63 (1904) "*Baxteria*"; Lemée, Dict. Pl. Phan. I. 529 (1929).—One species in Australia.

Standard species: *B. australis* R. Br. l. c., the original species.

Baxteria Reichb. Consp. 131 (1828) belonging to the Asclepiadaceae was adopted by some earlier authors as Bartl. Ord. 203 (1830); Spach in Orbigny, Dict. II. 510 (1842); Endl. Gen. 597 (1838); Meisn. Gen. 270, Com. 177 (1840); Gardn. in Lond. Jour. Bot. I. 178 (1842); Dcne. in DC. Prodr. VIII. 665 (1844); Lindl. Veg. Kingd. 627 (1847). In 1876 it was included by Bentham & Hooker in *Marsdenia* and by Post & Kuntze in 1904 in *Stephanotis*; it seems not to have been revived by any later author. *Baxteria* and *Baxteria* must be considered orthographic variants and therefore homonyms. Reichenbach proposed the name for *Harrisonia* Hook. (1826) because of the earlier homonym *Harrisonia* Adans., but there is also a *Harrisonia* Neck. of 1790 and a *Harrisonia* R. Br. of 1825 which is generally treated as a valid genus of Simarubaceae and needs conservation.

There is also a third homonym, *Baxteria* Van Heurck, Traité Diatom. 460 (1899) a monotypic genus belonging to the Bacillariaceae, which is treated as a valid genus in Engl. & Prantl, Nat. Pflanzenfam. I.-1^b, p. 101 (1896); this genus should receive another name.

Considering the fact that *Baxteria* R. Br. is generally recognized and has no synonym to take its place, its conservation is recommended. If it should be considered desirable to separate again *Baxteria* Reichb. from *Marsdenia*, Reichenbach's genus must receive a new name.

159 **Beckera** Fresen. in Mus. Senkenberg. II. 132 (1837)

versus

Beckeria Bernh. Syst. Verz. Erfurt, 20 (1800).

Beckera Fresen. Gramineae.

Adopted by: Trinius in Mém. Acad. Sci. St. Pétersb. sér. 6, III. Bot. 174 (1839); Endl. Gen. Suppl. I. 1353 (1841); Meisn.

Gen. 415, Comm. 318 (1843); Heynh. Nom. II. 63 (1846) "*Beckeria*"; Richard, Tent. Fl. Abyss. II. 358 (1851); Steud. Syn. Pl. Glum. I. 117 (1854); Figari & De Not. in Mem. Acad. Torin. 1854, p. 320, t. 3; Walp. Ann. Bot. VI. 936 (1861); Benth. & Hook. f. Gen. III. 1117 (1883); Engl. & Prantl, Nat. Pflanzenfam. II.-2, p. 32 (1887); Durand & Schinz, Consp. Fl. Afr. 736 (1895); Dalla Torre & Harms, Gen. Siphon. 13, no. 159 (1900); Post & Ktze. Lex. Gen. Phan. 63 (1904); Thonner, Blütenpfl. Afr. 88 (1908); Stapf in Oliver, Fl. Trop. Afr. IX. 22 (1917); Lemée, Dict. Pl. Phan. I. 533 (1929).—About 4 species in Abyssinia.

Standard species: *B. polystachya* Fresen. l. c., the original species.

Beckeria Bernh. belongs also to the Gramineae; it is a synonym of *Melica* L. and does not seem to have been recognized by any author.

Beckera and *Beckeria* are orthographic variants and must be considered homonyms; the latter spelling was used by Heynhold (l. c.) for *Beckera* Fresen.

In view of the fact that *Beckera* Fresen. has been universally adopted and has no synonym to take its place, its conservation is strongly recommended.

5768 **Bellucia** Necker, Elem. II. 142 (1790)

versus

Belluccia Adans. Fam. II. 344 (1763).

Bellucia Neck. Melastomataceae.

Adopted by: Naudin in Ann. Sci. Nat. sér. 3, XVI. 102 (1851); Mueller in Walp. Ann. Bot. IV. 701 (1857); Karsten in Linnaea, XXX. 158 (1860); Griseb. Fl. Brit. W. Ind. 263 (1864); Benth. & Hook. f. Gen. Pl. I. 768 (1865); Triana in Trans. Linn. Soc. XXVIII. 22, 141 (1873); Baillon in Adans. XII. 82 (1877); Hist. Pl. VII. 64 (1880); Cogniaux in Mart. Fl. Brasil. XIV. 4, p. 511 (1888); Naudin in DC. Monog. Phan. VII. 1026 (1891); Durand & Pitt. Prim. Fl. Costaric. 167 (1891); Engl. & Prantl, Nat. Pflanzenfam. III.-7, p. 190 (1893); Dalla Torre & Harms, Gen. Siphon. 358, no. 5768 (1903); Post & Ktze. Lex. Gen. Phan. 64 (1904) "*Belluccia*"; Pilger in Verh. Bot. Ver. Brandenburg. XLVII. 181 (1905); Lemée, Dict. Pl. Phan. I. 543 (1929); Gleason in Bull. Torr. Bot. Club, LVIII. 257 (1931).—About 12 species in C. and S. Amer.

Standard species: *B. grossularioides* (L.) Triana (*Blakea quinquenervia* Aubl., *Bellucia Aubletii* Cogn.), the original species referred to, but not named by Necker, also the best known and most widely distributed of all the species.

Belluccia Adans. Fam. II. 344 (1763) belonging to the Rutaceae was not taken up by any author; it is a synonym of *Ptelea* L. and has never received a specific epithet. *Bellucia* Neck. and *Belluccia* Adans. must be considered orthographic variants, both being named after the same man; both spellings have been used for each name, for *Bellucia* Neck. is spelled *Belluccia* by Post & Ktze. (l. c.) and *Belluccia* Adans. is spelled *Bellucia* by Meisner (Gen. II. 46, in synonym. 1836).

In view of the fact that *Bellucia* Neck. is generally recognized and *Belluccia* Adans. is a synonym, it is advisable to conserve *Bellucia* Neck. If not conserved, *Apatitia* Desv. (1825) is apparently the name to be taken up in its place; it seems not to have been adopted by any author.

5329 **Bennettia** Miq. Fl. Ind. Bat. I. ii. 105 (1859)

versus

Bennettia S. F. Gray, Nat. Arr. Brit. Pl. II. 440 (1821).

Bennetia Raf. in Ser. Bull. Bot. I. 220 (1830).

Bennettia R. Br. in Bennett, Pl. Jav. Rar. 249, t. 50 (1852).

Bennettia Miq. Flacourtiaceae.

Adopted by: Benth. & Hook. f. Gen. I. 128 (1862); Engl. & Prantl, Nat. Pflanzenfam. III.-6a, p. 44 (1893); ed. 2, XXI. 442 (1925); Koorders & Valet. Bijdr. Booms. Java, V. 28 (1900); Atl. Baumart. Java II. fig. 336, 337 (1914); Dalla Torre & Harms, Gen. Siphon. 329, no. 5329 (1905); Koorders, Exkursionsfl. Java, II. 635 (1912); Gilg in Bot. Jahrb. LV. 283 (1918); Lemée, Dict. Pl. Phan. I. 550 (1929).—Three species in China, Malaya, and N. Guinea.

Standard species: *B. Horsfieldii* Miq. = *B. leprosipes* (Clos) Koord., the original species.

Bennettia S. F. Gray belonging to the Compositae is a synonym of *Saussurea* DC. and does not seem to have been adopted by any author.

Bennetia Raf. belonging to the Gramineae is a synonym of *Sporobolus* and was not adopted by any author.

Bennettia R. Br. belonging to the Euphorbiaceae was adopted by Baill. Ét. Euphorb. 311 (1858) and by Muell. Arg. in DC. Prodr. XV. ii. 1036 (1866), but by most authors it is considered a synonym of *Galearia* Zoll. & Mor. (1845) which, however, needs conservation on account of *Galearia* Presl (1830).

Considering the fact that *Bennettia* Miq. has been generally accepted, its conservation might be recommended. Since it is, however, a small genus of no economic importance, its three species apparently rare and local, the recently proposed name *Bennettia-dendron* Merr. in Jour. Arnold Arb. VIII. 10 (1927) may be adopted.

3182 **Bergenia** Moench, Meth. 664 (1794)

versus

Bergena Adans. Fam. II. 345 (1763).

Bergenia Neck. Elem. II. 108 (1790).

Bergenia Moench. Saxifragaceae.

Adopted by: Reichenb. Consp. 159 (1828); Spach, Vég. Phan. VI. 59 (1836); Sternb. Rev. Saxifrag. Suppl. II. 2 (1831); Engl. & Prantl, Nat. Pflanzenfam. III. 2a, p. 49 (1890); ed. 2, XVIIIa, 117 (1930); Dalla Torre & Harms, Gen. 199, no. 3182 (1901); Komarov in Fedde, Rep. IX. 393 (1911); Nakai in Bot. Mag. Tokyo, XXVIII. 304 (1914); Fedtchenko, Fl. Aziat. Ross. fasc. 11, t. 2 (1917); Guillaumin in Bull. Mus. Hist. Nat. Paris, XXIV. 359 (1928); Lemée, Dict. Pl. Phan. I. 555 (1929).—About 9 species in N. and E. Asia, Himal.

Standard species: *B. bifolia* Moench=*B. crassifolia* (L.) Fritsch, the original species.

Bergena Adans. belonging to the Lecythidaceae is a synonym of *Lecythis* Loeffl. (1758) and has not been adopted by any botanist.

Bergenia Neck. belonging to the Lythraceae is a synonym of *Lythrum* L. and has not been adopted by any author.

There is a fourth homonym, *Bergenia* Raf. Sylv. Tellur. 102 (1838), which belongs to the Lythraceae and is included in *Cuphea*; it has never been recognized by any botanist.

Since *Bergenia* Moench has been generally adopted and none of the other homonyms have been taken up as valid genera, it seems advisable to conserve it. If not conserved, *Geryonia* Schrank (1818) will become the legitimate name of *Bergenia* Moench, which by many botanists is referred as a subgenus to *Saxifraga* L. Another synonym is *Megasea* Haw. Saxifr. Enum. 6 (1821) which seems to have been used only in horticultural literature.

2804 **Bernieria** Baill. in Bull. Soc. Linn. Paris, I. 434 (1884)

versus

Berniera DC. Prodr. VII. 18 (1838).

Bernieria Baill. Lauraceae.

Adopted by: Durand, Ind. Gen. Phan. 384 (1888); Engl. & Prantl, Nat. Pflanzenfam. III.-2, p. 121 (1889) "*Berniera*"; Dalla Torre & Harms, Gen. Siph. 178, no. 2804 (1900); Post & Ktze. Lex. Gen. Phan. 66 (1904); Lemée, Dict. Pl. Phan. I. 560 (1929).—One species in Madagascar.

Standard species: *B. madagascariensis* Baill., l. c., the original species.

Berniera DC. belonging to the Compositae does not seem to have been adopted by any botanist; it was referred to *Gerbera* Gronov. as a section in 1844 by Schultz Bip. in Flora XXVII. 780.

Since *Bernieria* Baill. has been generally adopted and has no synonym to take its place, it is advisable to conserve it.

5035 **Bernoullia** Oliv. in Hook. Icon. Pl. XII. t. 1169 (1873)

versus

Bernoullia Neck. Elem. II. 97 (1790).

Bernoullia Oliv. Bombacaceae.

Adopted by: Durand, Ind. Gen. Phan. 41 (1888) "*Bernoullia*"; Engl. & Prantl, Nat. Pflanzenfam. III.-6, p. 65 (1890); Dalla Torre & Harms, Gen. Siphon. 310, no. 5035 (1901); Post & Ktze. Lex. Gen. Phan. 66 (1904); Lemée, Dict. Pl. Phan. I. 560 (1929).—One species in C. Am.

Standard species: *B. flammea* Oliv., l. c., the original species. *Bernoullia* Neck. belonging to the Rosaceae, does not seem to have been taken up by any author; it is a synonym of *Geum* L. There is a third homonym, *Bernoullia* Heer, Fl. Foss. Helv. (1876-77), which must receive another name.

Since *Bernoullia* Oliv. has been generally accepted and has no synonym to take its place, while *Bernoullia* Neck. has not been taken up by any author, it is advisable to conserve it.

5708 **Bertolonia** Raddi in Mem. Soc. Ital. Sci. XVIII. 384, t. 5, fig. 3 (1820)

versus

Bertolonia Spin. Cat. Jard. St. Sebast. 24 (1809).

Bertolonia Raf. ap. Desv. Jour. de Bot. IV. 177 (1814), nomen.

Bertolonia Raddi. Melastomataceae.

Adopted by: Raddi in Mem. Soc. Ital. Sci. XX. 113 (Melast. Brasil.) (1828); DC. Prodr. III. 113 (1828); Mart. Nov. Gen. III. 116, t. 257 (1829); G. Don, Gen. Syst. II. 740 (1832); Spach, Vég. Phan. IV. 220 (1835); Meisn. Gen. 114, II. 81 (1838); Endl. Gen. 1209 (1840); Naud. in Ann. Sci. Nat. sér. 3, XV. 317 (1851); Benth. & Hook. f. Gen. I. 755 (1867); Cogn. in Mart. Fl. Bras. XIV.-4, p. 49 (1886); in DC. Monog. Phan. VII. 530 (1891); Engl. & Prantl, Nat. Pflanzenfam. III.-7, p. 172 (1893); Dalla Torre & Harms, Gen. 355, no. 5708 (1903); Post & Ktze. Lex. Gen. Phan. 67 (1904); Lemée, Dict. Pl. Phan. I. 567 (1929).—About 10 species in Brazil.

Standard species: *B. nymphaeifolia* Raddi, l. c., the original species.

Bertolonia Spin, Cat. Jard. St. Sebast. 24 (1809) is a synonym of *Myoporum* Banks, its only species *B. glandulosa* Spin being identical with *M. serratum* R. Br.

Bertolonia Raf. ex Desv. Jour. de Bot. IV. 177 (1814); in Jour. Phys. Chim. Hist. Nat. LXXXIX. 259 (1819) is a synonym of *Lippia*, having been based on *Verbena nodiflora* L.=*Lippia nodiflora* (L.) Michx. and related species. The citation "Raf. in Am. Monthl. Mag. 1818, 267" in Ind. Kew. is incorrect.

Bertolonia DC. in Ann. Mus. Paris, XIX. t. 14 (1812) cited in Ind. Kew and Pfeiffer, Nom., appears op. cit. p. 65, 71, tab. 5 (tab. 14) as *Chabraea* with the species *Ch. purpurea* which is based on *Perdicium purpureum* Vahl=*Leuceria purpurea* (Vahl) Hook. & Arn. belonging to the Compositae.

There are also a few later homonyms:—

Bertolonia Spreng. Neue Entdeck. II. 110, t. 1 (1821); Syst. II. 465 (1825); this is identical with *Chrysochlamys* Poepp. belonging to the Guttiferae.

Bertolonia Sessé & Moc. ex DC. Prodr. II. 589 (1825) is a synonym of *Cercocarpus fothergilloides* H. B. K. belonging to Rosaceae.

Since *Bertolonia* Raddi has been universally accepted, while the two earlier homonyms have not been adopted by any author and are reduced to synonymy, its conservation is highly desirable. If not conserved *Triblemma* R. Br. ap. Sprengel, Gen. I. 342 (1830) would take its place; this name was first published by DC. Prodr. 313 (1828) as a synonym of *Bertolonia* Raddi and seems to have been adopted after Sprengel only by Steudel, Nomencl. II. 698 (1841).

1055 *Bessera* Schult. f. in Linnaea IV. 121 (1829)

versus

Bessera Schult. Obs. Bot. 27 (1809).

Bessera Spreng. Pugill. II. 90 (1815).

Bessera Vellozo, Fl. Flum. 147 (1825).

Bessera Schult. f. Liliaceae.

Adopted by: Roem. & Schult. Syst. VII. p. lviii, 996 (1830); Endl. Gen. 143 (1837); Lindl. Bot. Reg. n. s. XII. t. 34 (1839); Meisn. Gen. 399, II. 302 (1842); Kunth, Enum. IV. 476, 699 (1843); Spach, Vég. Phan. XII. 255 (1846); Wats. Bot. Calif. II. 157 (1880); Benth. & Hook. f. Gen. III. 801 (1883); Hemsl. Biol. Centr. Am. Bot. III. 377 (1885); Engl. & Prantl, Nat. Pflanzenfam. II.-5, p. 58 (1888); Dalla Torre & Harms, Gen. 66, no. 1055 (1900); Post & Ktze. Lex. Gen. 67 (1904); Macbr. in Contr. Gray Herb. s. nov. LVI. 11 (1918); Lemée, Dict. Pl. Phan. I. 567 (1929).—Four species in South Western U. S. and Mexico (including *Androstephium* Torr. and *Behria* Greene).

Standard species: *B. elegans* Schult. f., the original species.

Bessera Schult. belonging to the Boraginaceae is referred to *Pulmonaria* L., its type *B. azurea* (Bess.) Schult. being identical with *Pulmonaria azurea* Bess.=*P. angustifolia* L. The name has not been taken up by any later author.

Bessera Spreng. has been referred to *Xylosma* Forst. (Flacourtiaceae), its type species *B. spinosa* Spreng. being identical with *X. nitidum* (Hellen.) Gray; the second species, *B. inermis* has been identified with *Flueggea microcarpa* Bl. (Euphorbiaceae). The name has not been taken up by any author.

Bessera Vellozo belonging to the Nyctaginaceae has been referred to *Pisonia* L., and its type species *B. calycanthea* Vell. identified with *Pisonia Olfersiana* Lk. Kl. & Otto (*Torrubia* O. Standl.). The name has not been taken up by any author.

Since *Bessera* Schult. f. has been universally adopted and none of the earlier homonyms accepted by any author, it is advisable to conserve it. If not conserved *Pharium* Herb. in Bot. Reg. XVII. t. 1546 (1832) would take its place; its type *Ph. fistulosum* Herb. is identical with *B. elegans*. This name seems to have been adopted only by Steud. Nomencl. ed. 2, II. 316 (1841).

8855 *Bigelowia* DC. Prodr. V. 329 (1836)

versus

Bigelowia Raf. in Jour. Phys. Chim. Hist. Nat. LXXXIX. 289 (1819), sphalmate "*Bigelonia*."

Bigelowia Sm. in Rees, Cyclop. XXXIX. (1819).

Bigelowia Spreng. Neue Entdeck. II. 150 (1821).

Bigelowia DC. ms. ex Gingins in DC. Prodr. I. 290 (1824), as synon.

Bigelowia Spreng. Syst. I. 366, 404 (1825).

Bigelowia DC. Compositae.

Adopted by: DC. Coll. Mem. IX. 22, t. 5 (1838); Endl. Gen. 385 (1838); Meisn. Gen. 188, II. 127 (1839); Spach, Vég. Phan. X. 29 (1841); Nutt. in Am. Phil. Trans. n. ser. VII. 323 (1841); Torr. & Gray, N. Am. Fl. II. 231 (1841); Gray, Man. 215 (1848); Gray, Syn. Fl. I. pt. II. 135 (1884); Engl. & Prantl, Nat. Pflanzenfam. IV.-5, p. 151 (1890); Dalla Torre & Harms, Gen. 530, no. 8855 (1905); Robins. & Fern. Gray's Man. 798 (1908).—About 40 species in N. Am. s. to Mex. (including *Chrysothamnus* Nutt.); one or two species as limited by Nuttall (1841) and others.

Standard species: *B. nudata* (Michx.) DC., the oldest of the two closely related species grouped by DC. under § Genuinae.

Bigelowia Raf. belonging to the Caryophyllaceae is referred to *Arenaria*, its two species *B. elongata* and *B. montana* being identical with *A. lanuginosa* (Michx.) Rohrb. and *A. montana* L.

Bigelovia Sm. belonging to the Oleaceae was proposed for *Borya* Willd., not Labill. = *Forestiera* Willd.

Bigelovia Spreng. (1821) belonging to the Flacourtiaceae is referred to *Casearia*, its only species *B. brasiliensis* Spreng. having been identified with *Casearia inaequilatera* Camb.

Bigelovia DC. ms. is cited only as a synonym of *Noisettia* H. B. K. (Violaceae) and was never taken up as a valid genus.

Bigelovia Spreng. (1825) belonging to the Rubiaceae has been referred to *Borreria* G. F. W. Mey. The genus has been accepted only by a few earlier botanists as Bl. Bijdr. 945 (1826); Wight & Arn. Prodr. I. 437 (1834); Miquel, Fl. Ind. Bat. II. 333 (1856).

Since *Bigelovia* DC. has been generally accepted, and of the earlier homonyms only *Bigelovia* Spreng. (1825) has been adopted by a few authors, its conservation is advisable. If not conserved *Chondrophora* Raf. New Fl. N. Am. IV. 79 (1836) would take its place; it has in fact been taken up by a few recent American authors as Britton & Brown, Ill. Fl. III. 325 (1898); Britton, Man. Fl. N. St. Can. 930 (1901); Small, Fl. S. E. U. S. 1184 (1903); Man. S. E. Fl. 1342 (1933), but only in the restricted sense of *Bigelovia* as limited by Nuttall (1841), Torrey & Gray (1841), Gray (1848) (= *Bigelovia* § *Genuinae* DC.). *Chondrophora*, moreover, was published without adequate description, being only incidentally mentioned under *Mesadenia* Raf. as a new genus based on *Chrysocoma nudata* Michx. and "with a scaly phoranthé, etc." It seems doubtful whether this should be accepted as valid publication. Most authors except those named above include the species separated by Nuttall as *Chrysothamnus*, while Benth. & Hook. f. Gen. II. 255 (1873) use the latter name instead of *Bigelovia* DC., also Lemée, Dict. Pl. Phan. II. 156 (1930).

2902 **Bivonaea** DC. in Mém. Mus. Paris, VII. 241 (1821); Syst. II. 554 (1821)

versus

Bivonea Raf. Fl. Ludov. 138 (1817).

Bivonia Spreng. Neue Entdeck. II. 116 (1821).

Bivonaea DC. Cruciferae.

Adopted by: DC. Prodr. I. 208 (1824); Spreng. Syst. II. 869 (1825); G. Don, Gen. Syst. I. 221 (1831); Meisn. Gen. 14, II. 13 (1837); Spach, Vég. Phan. VI. 325 (1838); Endl. Gen. 879 (1839); Benth. & Hook. f. Gen. I. 88 (1862); Passerini & Gib. Comp. Fl. Ital. 823 (1880); Parl. Fl. Ital. IX. 679 (1890); Engl. & Prantl, Nat. Pflanzenfam. III.-2, p. 166 (1891); Fiori & Paol. Fl. Anal. Ital. I. 469 (1899); Dalla Torre & Harms, Gen. 183, no. 2902 (1901); Post & Ktze. Lex. Gen. 69 (1904);

Fiori, Nuov. Fl. An. Ital. I. 622 (1924); Lemée, Dict. Pl. Phan. I. 583 (1929) "*Bivonea*."—Four species in the W. Mediterr. Reg. Standard species: *B. lutea* DC. l. c., the original species.

Bivonea Raf. based on *Jatropha stimulosa* Michx. (= *J. urens* L.), without generic description; also in Jour. Phys. Chim. Hist. Nat. LXXXIX. 260 (1819). Rafinesque refers to Neogenyton (1814) as the first publication, but no work of this title of 1814 is known.

Bivonia Spreng. belonging to the Euphorbiaceae is referred to *Bernardia* P. Br., the only species *B. axillaris* Spr. = *Bernardia axillaris* (Spreng.) Muell. Arg.

A later homonym is *Bivonaea* Moc. & Sessé ex DC. Prodr. III. 372 (1828) published as a synonym of *Cardionema* DC. (Caryophyllaceae) now referred to *Acanthonychia* Rohrb.

Considering the fact that *Bivonaea* DC. has been universally accepted, and none of the homonyms has been taken up by any author, its conservation is recommended. If not conserved *Pastorea* Tod. (1854), now considered a section of *Bivonaea*, would take its place.

Bivonaea, *Bivonea* and *Bivonia* are orthographic variants, since they are named in honor of the same man, Ant. Bivona Bernardi, with but slight changes in the ending.

1021 **Blandfordia** Sm. Exot. Bot. I. 5, t. 4 (Dec. 1804)

versus

Blandfordia Andr. Bot. Rep. V. t. 343 (Feb. 1804).

Blandfordia Sm. Liliaceae.

Adopted by: R. Br. Prodr. I. 295 (1810); Salisb. in Trans. Hort. Soc. I. 335 (1812); Poir. in Dict. Sci. Nat. IV. 116 (1816), "*Blandfortia*"; Sprengel, Syst. II. 40 (1825); Roem. & Schult. Syst. VII. p. xxxii. 425 (1829); Endl. Gen. 142 (1837); Meisn. Gen. 399, II. 302 (1842); Spach, Vég. Phan. XII. 376 (1846); Benth. Fl. Austral. VII. 22 (1878); Benth. & Hook. f. Gen. III. 774 (1883); Engl. & Prantl, Nat. Pflanzenfam. II.-5, p. 41 (1888); Dalla Torre & Harms, Gen. Siph. 64, no. 1021 (1900); F. M. Bailey, Queensl. Fl. V. 1624 (1902); Compr. Cat. Queensl. Pl. 553 (1909); Lemée, Dict. Pl. Phan. I. 587 (1929).—Four species in Australia.

Standard species: *B. nobilis* Sm., l. c. the original species.

Blandfordia Andr. belonging to the Diapensiaceae is a synonym of *Galax* L., its type species, *B. cordata* Andr. being identical with *Galax aphylla* L.

Since *Blandfordia* Sm. has been universally accepted and has no synonym to take its place, its conservation is strongly recommended. *Blandfordia* Andr. has not been adopted by any author.

5392 *Blumenbachia* Schrad. in Goetting. Gel. Anz. 1825, p. 1705
versus

Blumenbachia Koeler, Gram. Gall. Germ. 28 (1802).

Blumenbachia Schrad. Loasaceae.

Adopted by: DC. Prodr. III. 340 (1828); Camb. in St. Hil. Fl. Bras. II. 207 (1829); Spreng. Gen. I. 408 (1830); G. Don, Gen. Syst. III. 62 (1834); Meisn. Gen. 125, II. 90 (1838); Spach, Vég. Phan. VI. 244 (1838); Gay, Bot. Hist. Chile II. 432 (1846); Benth. & Hook. f. Gen. I. 804 (1867); Hieron. Pl. Diaphor. Fl. Argent. 120 (1882); Engl. & Prantl, Nat. Pflanzenfam. III.-6a, p. 121 (1894); Urban in Mart. Fl. Bras. XIII. 3, p. 212 (1899); in Nov. Act. Leop.-Carol. LXXVI. 351 (1900); Dalla Torre & Harms, Gen. 333, no. 5392 (1903); Hicken, Chloris Plat. Argent. 165 (1910); Lemée, Dict. Pl. Phan. 599 (1929).—Three species in S. Am.

Standard species: *B. insignis* Schrad., the original species.

Blumenbachia Koeler belongs to *Andropogon* L. (Gramineae), its type species, *B. halepensis* (L.) Koel., being identical with *A. halepensis* (L.) Brot. (*A. arundinacea* Scop.).

In view of the fact that *Blumenbachia* Schrad. has been universally accepted and has no synonym to take its place, its conservation is recommended. *Blumenbachia* Koeler does not seem to have been adopted by any author.

4011 *Boenninghausenia* Reichenb. Consp. 197 (1828) sine descr.;
apud Meisn. Gen. 60, II. 44 (1836)
versus

Boenninghausia Spreng. Syst. III. 153, 245 (1826).

Boenninghausenia Reichenb. Rutaceae.

Adopted by: Bartl. Ord. 390 (1830) "*Boennighausenia*," nomen; Spach, Vég. Phan. II. 314 (1834) "*Boennighausenia*"; Endl. Gen. 1160 (1840); Benth. & Hook. f. Gen. I. 287 (1862); Hook. f. Fl. Brit. Ind. I. 48 (1875); Hemsl. in Jour. Linn. Soc. XXIII. 102 (1886); Engl. & Prantl, Nat. Pflanzenfam. III.-4, p. 129 (1896); Dalla Torre & Harms, Gen. 252, no. 4011 (1901); Koorders, Exkursionsfl. Java II. 421 (1912); Lemée, Dict. Pl. Phan. I. 606 (1929); Rehder in Jour. Arnold Arb. XIV. 225 (1933).—One species in E. and S. Asia and Malaysia.

Standard species: *B. albiflora* (Hook.) Meisn. Gen. II. 44 (1836), the original species.

Boenninghausia Spreng. belonging to the Leguminosae is a synonym of *Chaetocalyx* DC. (1825), and its only species *B. vincentina* (Ker-Gawl.) Spreng. is identical with *Chaetocalyx vincentina* (Ker-Gawl.) DC.

Boenninghausenia and *Boenninghausia* are orthographic variants, since both are named for the same man, Cl. M. Fr.

von Boenninghausen, director of the Botanic Garden at Muenster, Germany.

Since *Boenninghausenia* has been universally accepted, its conservation is recommended. If not conserved, its place will be taken by *Podostaurus* Jungh. in Nat. & Geneesk. Arch. II. 45 (1845) which was only adopted by Endl. Gen. Suppl. V. 101 (1850) who did not recognize its identity with *Boenninghausenia*. Another synonym is *Bodiniera* Lévl. & Vant. in Bull. Acad. Géog. Bot. XI. 48 (1902), see Rehder in Jour. Arnold Arb. XIV. 225 (1933).

6979 *Bonamia* Thouars in Dict. Sci. Nat. V. 145 (1804); Hist. Vég. Isl. Afr. 17 (1805)
versus

Bonamia Neck. Elem. I. 316 (1790).

Bonamia Thouars. Convolvulaceae.

Adopted by: Roem. Collect. 202 (1809); Roem. & Schult. Syst. IV. p. xl. 467 (1819); Spreng. Syst. I. 614 (1825); Choisy in Mém. Soc. Phys. Hist. Nat. Genève, VI. 495 (1833); in DC. Prodr. IX. 439 (1845); G. Don, Gen. Syst. IV. 300 (1837); Endl. Gen. 652 (1839); Meisn. Gen. 275, II. 181 (1840); A. Gray in Proc. Am. Acad. V. 337 (1862); Benth. & Hook. f. Gen. II. 877 (1876); Baill. Hist. Vég. X. 327 (1888); in Bull. Soc. Linn. Paris, II. 817 (1898); Engl. & Prantl, Nat. Pflanzenfam. IV.-3a, p. 17 (1897); Dalla Torre & Harms, Gen. 420, no. 6979 (1904); Lemée, Dict. Pl. Phan. I. 617 (1929).—Three species in Madag. and Sandwich Isls.

Standard species: *B. madagascariensis* Poir. Encycl. Suppl. I. 677 (1810), the original species.

Bonamia Neck. belonging to the Labiatae was separated from *Stachys* L., but does not seem to have been adopted by any author. *Bonamia* and *Bonamia* are orthographic variants, both being named for the same man, François Bonami (see Thouars, l. c.; Pritzel, Thesaur. ed. 2, p. 34) or Bonamy (Cat. Libr. Brit. Mus. Nat. Hist. I. 194) of Nantes who published in 1782 *Florae nannetensis prodromus* (see also Bull. Soc. Sci. Nat. Ouest France, V. 75, 1895).

Since *Bonamia* has been universally accepted and has no synonym to take its place, its conservation is recommended.

6099 *Bonannia* Guss. Fl. Sicul. Syn. I. 355 (1842)
versus

Bonannia Raf. Specchio, I. 115 (1814).

Bonannia Presl, Fl. Sicul. I. 99 (1826).

Bonannia Guss. Umbelliferae.

Adopted by: Benth. & Hook. f. Gen. I. 910 (1867); Parl. Fl.

Ital. VIII. 303 (1888); Tornabene, Fl. Aetn. II. 346 (1890); Engl. & Prantl, Nat. Pflanzenfam. III.-8, p. 226 (1898); Fiori & Paol. Fl. Anal. Ital. II. 174 (1900); Halácsy, Consp. Fl. Graec. I. 641 (1901); Dalla Torre & Harms, Gen. 375, no. 6099 (1903); Fiori, Nuov. Fl. Anal. Ital. II. 61 (1925); Hayek, Prodr. Fl. Pen. Balc. I. 1025 (1927); Lemée, Dict. Pl. Phan. I. 618 (1929).—One species in S. Europe.

Standard species: *B. resinifera* (Guss.) Guss.=*B. graeca* (L.) Halácsy, the original species.

Bonannia Raf. belonging to the Sapindaceae is a synonym of *Blighia* Kon. (1806), its type species *B. nitida* Raf. l. c., being identical with *Blighia sapida* Kon. It has not been taken up by any author.

Bonannia Presl belonging to the Cruciferae is referred to *Sinapis* L., its two species, *B. officinalis* Presl and *B. dissecta* (Lag.) Presl being identical with *S. alba* L. and *S. dissecta* Lag. It does not seem to have been taken up by any author.

In view of the fact that *Bonannia* Guss. has been universally accepted and has no synonym to take its place, its conservation is recommended.

5144 **Bonnetia** Mart. & Zucc. Nov. Gen. Spec. I. 114 (1824)
versus

Bonnetia Schreb. Gen. 363 (1789).

Bonnetia Neck. Elem. I. 368 (1790).

Kieseria Nees in Wied-Neuwied, Reise Brasil. II. 338 (1821).

Bonnetia Mart. & Zucc. Theaceae.

Adopted by: Nees & Mart. in Nov. Act. Acad. Leop.-Carol. XII.-1, p. 36, t. 6 (1824); St. Hilaire, Fl. Bras. I. 301 (1827); Cambess. in Mém. Mus. Hist. Nat. Paris, XVI. 409 (1828); G. Don, Gen. Syst. I. 570 (1831); Meisn. Gen. 40, II. 30 (1837); Endl. Gen. 1020 (1840); Choisy in Mém. Soc. Phys. Hist. Nat. Genève, XIV. 159 (1855); Turcz. in Bull. Soc. Nat. Moscou, XXXI.-1, p. 246 (1858); Benth. & Hook. f. Gen. I. 187 (1862); Baill. Hist. Pl. IV. 236, 259 (1873); Wawra in Mart. Fl. Bras. XII.-1, p. 323 (1886); Oliver in Trans. Linn. Soc. Lond. II.-2, p. 272 (1887); Engl. & Prantl, Nat. Pflanzenfam. III.-6, p. 180 (1893); ed. 2, XXI. 149 (1925); Dalla Torre & Harms, Gen. 317, no. 5144 (1903); Pitard in Act. Soc. Linn. Bordeaux, LVIII. C. R. 49 (1903); Huber in Bol. Mus. Goeldi, VII. 301 (1913); Lemée, Dict. Pl. Phan. I. 619 (1929).—About eight species in trop. Am.

Standard species: *Bonnetia anceps* Mart. & Zucc., that of two original species upon which the description of the flowers is based; of *B. venulosa* Mart. & Zucc. the flowers are unknown.

Bonnetia Schreb. Gen. 363 (1789) belonging also to the Theaceae is a renaming of *Mahurea* Aubl. (1775); its type *B. palustris* (Aubl.) Gmel. Syst. 814 (1791)=*Mahurea palustris* Aubl.

Bonnetia Neck. Elem. I. 368 (1790) belonging to the Scrophulariaceae is a renaming of *Piripea* Aubl. (1775), which is a synonym of *Buchnera* L. (1753) and has not been taken up by any author.

Kieseria Nees in Wied-Neuwied, Reise Brasil. II. 338 (1821); Flora, IV. 298 (1821) was referred to *Bonnetia* Mart. & Zucc. by Nees and Martius in 1824; its type, *K. stricta* Nees becoming *B. stricta* (Nees) Nees & Mart. It was apparently taken up by only few recent authors as Ktze. Rev. Gen. I. 62 (1891) "*Kiesera*"; Post & Ktze. Lex. Gen. Phan. 308 (1904) "*Kiesera*"; Britton in Bull. Torr. Bot. Cl. XLI. 19 (1914). A later homonym *Kiesera* Reinw. ap. Blume, Cat. Gen. Buitenzorg, 93 (1823) nom.; Reinw. in Syll. Pl. Regensb. II. 11 (1925) was taken up by Miquel, Fl. Ind. Bat. I.-1, p. 290 (1850), but is generally united with *Tephrosia* Pers. (1807).

Considering the fact that *Bonnetia* Mart. & Zucc. has been universally accepted and the two earlier homonyms are illegitimate names, while *Kieseria* has been taken up only recently by a few authors, the conservation of *Bonnetia* Mart. & Zucc. is recommended.

3106 **Boscia** Lam. Rec. Planch. t. 395 (1797); Tabl. Encycl. II. 517 (1819)

versus

Boscia Thunb. Prodr. Pl. Cap. 32 (1794).

Boscia Lam. Capparidaceae.

Adopted by: Jaume St. Hil. Expos. Fam. Nat. II. 3 (1805); Lam. Encycl. Méth. Suppl. I. 680 (1810); DC. Prodr. I. 244 (1824); Reichenb. Consp. 188 (1828); G. Don, Gen. Syst. I. 277 (1831); Meisn. Gen. 17, II. 15 (1837); Spach, Vég. Phan. VI. 296 (1838); Endl. Gen. 892 (1839); Arnott in Hook. Jour. Bot. III. 153 (1841); Harv. & Sond. Fl. Cap. I. 60 (1859); Benth. & Hook. f. Gen. I. 108 (1862); Oliver, Fl. Trop. Afr. I. 91 (1868); Engl. & Prantl, Nat. Pflanzenfam. III.-2, p. 232 (1891); Engl. Pflanzenw. Ost-Afr. III. 185 (1895); Pestalozzi in Mitt. Bot. Mus. Zürich, VII. 152 (1898); Dalla Torre & Harms, Gen. 193, no. 3106 (1900); Thonner, Blütenpfl. Afr. 243 (1908); Sprague & M. L. Green in Kew Bull. 1913, 177; Lemée, Dict. Pl. Phan. I. 630 (1929).—About 25 species in trop. and S. Afr.

Standard species: *B. senegalensis* Lam., l. c., the original species.

Boscia Thunb. belonging to the Rutaceae was adopted only by few earlier botanists as Willd. Spec. I. 706 (1797); Persoon, Syn. I. 151 (1805); Thunb. Fl. Cap. I. 576 (1818); Roem. & Schult. Syst. III. 34, 486 (1818); Spreng. Syst. I. 494 (1825);

Arnott in Hook. Jour. Bot. III. 154 (1841). It is referred as a synonym to *Vepris* Comm. (1825), its type, *B. undulata* Thunb., being identical with *V. lanceolata* (Lam.) G. Don.

There is a third homonym *Boscia* Vellozo, Fl. Flum. IV. 150 t. 11 (1825) which is identical with *Fumifera* Leandr. ap. C. A. Mey. (1843).

Considering the fact that *Boscia* Lam. has been universally adopted, its conservation is recommended. If not conserved *Podoria* Pers. (1807) takes its place. The title page of vol. II of *Tableau Encyclopédique* is dated 1793, which would make *Boscia* Lam. the oldest homonym, but according to the bibliographical data given in Jour. Bot. XLIV. 319 the first part of vol. II. was published in 1797 and the second part which includes p. 517 came out in 1819. Plate 395 which contains the figure of *B. senegalensis* appeared in 1797 and constitutes the first publication of the genus. *Boscia* Lam., therefore, must be considered the younger homonym and needs conservation. This invalidates *Boscia* Thunb. for which *Vepris* Comm. ap. Juss. (1825) has been adopted, if the genus is not united with *Toddalia* Juss.

4516 Botryophora Hook. f. Fl. Brit. Ind. V. 476 (1888)

versus

Botryophora Bompard in Hedwigia, 1867, p. 129.

Botryophora J. G. Ag. in Lunds Univ. Aarskr. XXIII. 139 (1887).

Botryophora Hook. f. Euphorbiaceae.

Adopted by: Engl. & Prantl, Nat. Pflanzenfam. III.-5, p. 116 (1890); ed. 2, XIXc, p. 228 (1931); Dalla Torre & Harms, Gen. 283, no. 4516 (1901); Post & Ktze. Lex. Gen. 75 (1904) "*Botryophora*"; Ind. Kew., Suppl. I. 61 (1906) "*Bothryospora*" sphalmate; Ridley, Fl. Mal. Pen. III. 282 (1924); Lemée, Dict. Pl. Phan. I. 635 (1929).—One species in India.

Standard species: *B. Kingii* Hook. f., the original species.

Botryophora Bomp. belonging to the Chlorophyceae-Codiaceae is generally referred to *Halimeda* Lamour. (1812), as in Engl. & Prantl, Nat. Pflanzenfam. I.-2, p. 143 (1893).

Botryophora J. G. Ag. belonging to the Chlorophyceae-Dasycladaceae is adopted in Engl. & Prantl, Nat. Pflanzenfam. I.-2, p. 157 (1893), but by others referred to *Dasycladus* Ag. or *Coccocladus* Cramer.

Since *Botryophora* Hook. f. has been universally adopted and has no synonym to take its place, its conservation is recommended. It is apparently preferable to conserve *Botryophora* Hook. f. which is a valid genus and has no synonym to take its place, than to maintain *Botryophora* J. G. Ag. whose validity is doubtful and has been by some authors referred to other genera.

7042 Bourreria P. Br. Hist. Jam. 168 (1756)=*Beurreria* Jacq. Sel. Stirp. Am. Hist. 44, t. 173. fig. 17 (1763)=*Beureria* Spreng. Syst. I. 647 (1825)

versus

Beureria Ehret, Pl. & Papil. Rar. t. 13 (1755).

Bourreria P. Br. Boraginaceae.

Adopted by: Jacq. Enum. Pl. Carib. 2, 14 (1760); Adans. Fam. II. 177 (1763); Necker, Elem. I. 275 (1790); Benth. & Hook. f. Gen. II. 840 (1876); Hemsl. Biol. C. Am., Bot. II. 369, t. 59 (1881); S. Wats. in Proc. Am. Acad. XXIV. 62 (1889); Donn.-Smith in Bot. Gaz. XXV. 150 (1898); Britt. in Bull. Torr. Bot. Club, XLI. 10 (1914); Britt. & Millsp. Bahama Fl. 359 (1920); Britt. & Wils. Bot. Porto Rico and Virg. Isls. VI. 128 (1925); Standley in Contrib. U. S. Nat. Herb. XXIII. 125 (1924); Lemée, Dict. Pl. Phan. I. 670 (1929).—About 30 species in tropical America.

Standard species: *Bourreria succulenta* Jacq. Enum. Pl. Carib. 14 (1760) (*Cordia Bourreria* L.), that of the two species described by Jacquin which is based on P. Browne's description.

Beurreria Jacq.

Adopted by: Gaertn. f. Fruct. III. 170, t. 212 (1805); H. B. K. Nov. Gen. III. 67 (1818); Mart. Nov. Gen. Spec. II. 138 (1827); G. Don, Gen. Syst. IV. 389 (1837); Endl. Gen. 645 (1839); Spach, Vég. Phan. IX. 32 (1840).

Beureria Spreng.

Adopted by: Reichb. Consp. 118 (1828); Bartl. Ord. 197 (1830); Miers, Contr. Bot. II. 238, t. 86 (1860); Griseb. in Mem. Am. Acad. n. ser. VIII.-2, p. 528 (1863); Fl. Brit. W. Ind. Isls. 481 (1864); Engl. & Prantl, Nat. Pflanzenf. IV.-3a, p. 86 (1893); Dalla Torre & Harms, Gen. 424, no. 7042 (1903); O. E. Schulz in Urb. Symb. Antill. VII. 45 (1911); Urb. Symb. Antill. VIII. 581 (1921).

Beureria Ehret belonging to the Calycanthaceae is identical with *Calycanthus* L. which is a nomen conservandum (see Règl. Internat. ed. 2, p. 86, no. 2663. 1912).

The different spellings of the name including *Beurera* Ktze. are orthographic variants, since the genus is named for J. A. Beurer of Nuremberg; P. Browne, l. c., p. 168-169, uses an incorrect spelling when he says, "I have called it after Mr. Bourer, an apothecary of Nuremberg." As the citations above show, the original spelling is preferred by British and American botanists while *Beurreria* and *Beureria* are preferred by European continental botanists.

Considering the fact that P. Browne's genus has been generally accepted and is a rather important genus of about 30 species, its conservation in its original spelling "*Bourreria*" is recommended;

if a corrected spelling should be desired, *Beureria* or *Beurera* would be preferable rather than *Beurveria*. If not conserved the next oldest name will be *Morelosia* La Llave & Lex. which has been adopted by Kuntze, Rev. Gen. II. 439 (1891).

3185 **Boykinia** Nutt. in Jour. Acad. Philad. VII. 113 (1834)

versus

Boykinia Raf. Neogen. 2 (1825) "*Boykiana*" sphalmate.

Boykinia Nutt. Saxifragaceae.

Adopted by: Torrey & Gray, N. Am. Fl. I. 576 (1840); Endl. Gen. Suppl. I. 1415 (1841); Meisn. Gen. II. 357 (1843); Walp. Rep. II. 362 (1843); Gray, Man. Bot. ed. 2, 143 (1856); Benth. & Hook. f. Gen. I. 636 (1865); S. Watson, Bot. Calif. I. 196 (1876); Engl. & Prantl, Nat. Pflanzenfam. III.-2a, p. 51 (1890); ed. 2, XVIIIa, p. 119 (1930); Dalla Torre & Harms, Gen. 199, no. 3185 (1900); Robins. & Fernald, Gray's Man. ed. 7, p. 445 (1908); Jepson, Man. Flow. Pl. Calif. 458 (1925); Makino & Tanaka, Man. Fl. Nippon, 223 (1927); Lemée, Dict. Pl. Phan. I. 645 (1929); Makino & Nemoto, Nippon Shokub. Sôran, 427 (1931).—Seven species in N. Am., one in Japan.

Standard species: *B. aconitifolia* Nutt. l. c., the original species.

Boykinia Raf. belonging to the Lythraceae does not seem to have been adopted by any author. It is included in *Rotala* L., its type species *B. humilis* Raf. Autikon Bot. 9 (1840) being identical with *Rotala ramosior* (L.) Koehne.

The conservation of *Boykinia* Nutt. is desirable, since it had been generally accepted until Kuntze, Rev. Gen. I. 227 (1891), took up *Therophon* Raf. N. Am. Fl. IV. 66 (1836) which was adopted by: Millsp. Fl. W. Virginia, 361 (1892); Greene, Man. Bay Reg. 121 (1894); Britt. & Brown, Ill. Fl. II. 176 (1897); Britt. Man. Fl. N. St. Can. 480 (1901); Small, Fl. S. E. U. S. 500 (1903), Man. S. E. Fl. 595 (1933); Abrams, Fl. Los Angeles, 189 (1904); N. Am. Flora XXII. 123 (1905) "*Therophon*"; Rydb. Rocky Mtn. Fl. 384 (1917) "*Therophon*." Another synonym is *Telesonix* Raf. Fl. Tellur. II. 69 (1836); not adopted by any author.

1751 **Bracthia** Reichb. f. in Linnaea XXII. 853 (1849)

versus

Bracthia Trevisan, Algae Coccot. 57 (1848).

Bracthia Reichb. f. Orchidaceae.

Adopted by: Walp. Ann. Bot. III. 560 (1853); Reichb. Xenia Orchid. I. 74, t. 29 (1854); Engl. & Prantl, Nat. Pflanzenfam. II.-6, p. 193 (1889); Dalla Torre & Harms, Gen. 109, no. 1751 (1900); Post & Ktze. Lex. Gen. 77 (1904); Kränzlin in Notizbl. Bot. Gart. Berlin, VII. 431 (1920); Lemée, Dict. Pl. Phan. I. 647 (1929).—About 3 species in Colombia.

Standard species: *B. glumacea* Reichb. f., the original species.

Bracthia Trevisan is a genus of uncertain affinity referred to the Chlorophyceae, and does not seem to have been taken up by any author (cf. Engl. & Prantl, Nat. Pflanzenfam. I.-2, p. 27, in nota (1890)).

Since *Bracthia* Reichb. has been generally adopted, it is desirable to conserve the name; if not conserved, *Oncodia* Lindl. Fol. Orchid. Feb. 1853 will take its place, with the type species *O. glumacea* (Reichb.) Lindl.

8808 **Brachyandra** Philippi in Bot. Zeit. XV. 681 (1857) nomen; Fl. Atac. 34, t. 4 (1860)

versus

Brachyandra Naud. in Ann. Sci. Nat. sér. 3, II. 143 (1841).

Brachyandra Philippi. Compositae.

Adopted by: Benth. & Hook. f. Gen. II. 244 (1873); Philippi f. Cat. Pl. Vasc. Chil. 156 (1881); Baill. Hist. Pl. VIII. 132 (1886); Engl. & Prantl, Nat. Pflanzenfam. IV.-5, p. 138 (1890); Reiche, Fl. Chile, III. 263 (1902); Post & Ktze. Lex. Gen. 77 (1904); Dalla Torre & Harms, Gen. Siph. 527 no. 8808 (1905).—One species in Chile.

Standard species: *B. macrogyne* Phil., the original species.

Brachyandra Naud. belonging to the Melastomataceae is a synonym of *Pterolepis* Miq. (1840), its two species *B. perpusilla* and *B. pusilla* Naud. having been transferred to *Pterolepis* as *Pt. perpusilla* (Naud.) Cogn.

Considering the fact that *Brachyandra* Phil. has been universally accepted and has no synonym to take its place, its conservation is to be recommended. By Robinson in 1906 (in Proc. Am. Acad. XLII. 31 and Contr. Gray Herb. n. sér. XXXII. 31) it was reduced to a section of *Helogyne* Nutt. (1841), also by Lemée, Dict. Pl. Phan. II. 511 (1930) it is referred to *Helogyne* Nutt.

6720 **Brachylepis** Wight & Arn. Contr. Bot. Ind. 63 (1834)

versus

Brachylepis C. A. Mey. in Ledeb. Fl. Alt. I. 370 (1829).

Brachylepis Hook. & Arn. in Hook. Jour. Bot. I. 290 (1834).

Brachylepis Wight & Arn. Asclepiadaceae.

Adopted by: G. Don, Gen. Syst. IV. 161 (1837); Endl. Gen. 588 (1838), 1397 (1840); Spach, Vég. Phan. VIII. 538 (1839); Meisn. Gen. 266, II. 174 (1840); Dcne. in DC. Prodr. VIII. 495 (1844); Benth. & Hook. f. Gen. II. 742 (1876); Hook. f. Fl. Brit. Ind. IV. 7 (1883); Baill. Hist. Pl. X. 296 (1890); Engl.

& Prantl, Nat. Pflanzenfam. IV.-2, p. 214 (1895); Dalla Torre & Harms, Gen. 411, no. 6720 (1904); Post & Ktze. Gen. 77 (1904); Fyson, Fl. Nilgiri & Pulney, III. 418, fig. (1920); Lemée, Dict. Pl. Phan. I. 654 (1929).—One species in India.

Standard species: *B. nervosa* Wight & Arn., the original species.

Brachylepis C. A. Mey. belonging to the Chenopodiaceae has been adopted by only few earlier authors, as Spach, Vég. Phan. V. 278 (1836); Reichb. Handb. 239 (1837); Endl. Gen. Suppl. II. 33 (1842); Moq.-Tand. in DC. Prodr. XIII.-2, p. 216 (1849); Fenzl in Ledeb. Fl. Ross. III. 826 (1851). By Benth. & Hook. f. the genus was reduced to a section of *Anabasis* and has been so regarded by subsequent authors.

Brachylepis Hook. & Arn. belonging to the Asclepiadaceae was adopted by only a few earlier authors as Endl. Gen. 593 (1838); Spach, Vég. Phan. VIII. 539 (1839); Meisn. Gen. 269, II. 176 (1840); Decne. in Orbigny, Dict. II. 212 (1842). In 1844 the name was changed to *Melinia* Decne., the original species *B. Candolleana* becoming *M. Candolleana* (H. & A.) Decne.

Since *Brachylepis* Wight & Arn. has been generally accepted and has no synonym to take its place, its conservation is recommended. *Cornachina* Endl. & Fenzl, Nov. Stirp. Dec. 18 (1839) corrected to *Cornacchinia* Endl. Gen. 1397 (1840) proposed as a new name, is invalidated by the earlier *Cornacchinia* Savi (1837).

6408 *Brachynema* Benth. in Trans. Linn. Soc. XXII. 125, t. 22 (1857)

versus

Brachynema Griff. Notul. IV. 176 (1854).

Brachynema Benth. Ebenaceae.

Adopted by: Benth. & Hook. f. Gen. II. 666 (1876); Engl. & Prantl, Nat. Pflanzenfam. IV.-1, p. 165 (1891); Nachtr. 332 (1897); Baill. Hist. Pl. XI. 224 (1892); Dalla Torre & Harms, Gen. 395, 630, no. 6408 (1903); Kuhlmann in Arch. Jard. Bot. Rio, IV. 353 (1925); Lemée, Dict. Pl. Phan. I. 655 (1929).—One species in Brazil.

Standard species: *B. ramiflorum* Benth., l. c., the original species.

Brachynema Griff. belonging to the Verbenaceae was referred to *Sphenodesme* Jack (1820) and made a section of the genus by C. B. Clarke, its type species *B. ferruginea* being identical with *Sphenodesme barbata* Schau. (1847).

There is a third homonym, *Brachynema* F. v. Muell. Fragm. III. 90 (1862), belonging to the Saxifragaceae, which was changed to *Abrophyllum* Hook. f. (1864).

Considering the fact that *Brachynema* Benth. has been universally adopted and has no synonym to take its place, its conservation is recommended. According to Kuhlmann (l. c.) the genus belongs to the Olacaceae near *Tetrastylidium* Engl.

8840 *Bradburia* Torr. & Gray, Fl. N. Am. II. 250 (1841)

versus

Bradburia Raf. Fl. Ludovic. 104 (1817).

Bradburia Torr. & Gray. Compositae.

Adopted by: Endl. Gen. Suppl. III. 67 (1843); Schultz Bip. in Walp. Rep. II. 952 (1843); Lindl. Veg. Kingd. 710 (1847); Benth. & Hook. f. Gen. II. 251 (1873); A. Gray, Syn. Fl. N. Am. I. 2 (1884); Engl. & Prantl, Nat. Pflanzenfam. IV.-5, p. 149 (1890); Dalla Torre & Harms, Gen. 529, no. 8840 (1905); Lemée, Dict. Pl. Phan. I. 661 (1929).—One species in Texas.

Standard species: *B. hirtella* Torr. & Gray, the original species.

Bradburia Raf. belonging to the Leguminosae was adopted by only few authors as Spreng. Syst. III. 255 (1826) "*Bradburia*"; Meisn. Gen. 86, II. 62 (1837); Ktze. Rev. Gen. I. 163 (1891); Engl. & Prantl, Nat. Pflanzenfam. III.-3, p. 362 (1894). It is identical with *Centrosema* Benth. (1838) which is a nomen conservandum (see Règl. Internat. ed. 2, p. 90. 1912).

Considering the fact that *Bradburia* Torr. & Gray has been generally accepted and that *Bradburia* Raf. is a synonym of the conserved *Centrosema* Benth., the conservation of *Bradburia* Torr. & Gray is recommended. If not conserved the name will be replaced by *Mauchia* Ktze. Rev. Gen. I. 352 (1891) which was adopted by Post & Ktze. Lex. Gen. 354 (1904) and by Small, Fl. S. E. U. S. 1187 (1903).

4730 *Bridgesia* Bert. ap. Cambess. in Nouv. Ann. Mus. Paris, III. 234, t. 13 (1834)

versus

Bridgesia Hook. in Hook. Bot. Misc. II. 222, t. 92 (1831).

Bridgesia Hook. & Arn. III. 168, t. 102 (1833).

Bridgesia Bert. Sapindaceae.

Adopted by: Endl. Gen. 1068 (1840); Lem. in Orbigny, Dict. II. 735 (1842); Meisn. Gen. II. 346 (1843); Gay, Fl. Chile, I. 368 (1845); Benth. & Hook. f. Gen. I. 393 (1862); Baill. Hist. Pl. V. 417 (1874); Engl. & Prantl, Nat. Pflanzenfam. III.-5, p. 310 (1895); Dalla Torre & Harms, Gen. 295, no. 4730 (1901); Reiche, Fl. Chile, I. 257 (1898); Lemée, Dict. Pl. Phan. I. 675 (1929); Radlk. in Engl. Pflanzenr. IV.-165, p. 529 (1932).—One species in Chile.

Standard species: *B. incisifolia* Bert. l. c., the original species.

Bridgesia Hook. belonging to the Compositae has been referred to the genus *Polyachyrus* Lag. (1811) and does not seem to have been adopted by any author. Its type, *B. echinopsoides* Hook. is identical with *P. echinopsoides* DC.

Bridgesia Hook. & Arn. belonging to the Phytolaccaceae was adopted by only a few authors as Meisn. Gen. 63, II. 46 (1837); Dietr. Syn. II. 1384, 1616 (1840). It is a synonym of *Ercilla* A. Juss. (1832), its type, *B. spicata* Hook. & Arn., being identical with *E. volubilis* A. Juss. By Heimerl it was referred as a section to *Phytolacca*.

In view of the fact that *Bridgesia* Bert. has been generally adopted and the two earlier homonyms have been referred to other genera, it seems advisable to conserve it. If not conserved the name of the genus would be *Tripterocarpus* Meisn. Gen. 52, II. 37 (1837) with the type species *T. incisifolius* (Bert.) Meisn. l. c., II. 37, though in 1843 Meisner accepted (op. cit II. 346) *Bridgesia* Bert. citing his earlier name as a synonym.

2177 **Brugmansia** Bl. in Bijdr. Natuurk. Wetensch. II. 422 (1828)
versus
Brugmansia Pers. Syn. I. 216 (1805).

Brugmansia Bl. Rafflesiaceae.

Adopted by: Bl. Fl. Jav. I. 13, t. 3-6 (1828); Spreng. Gen. II. 716 (1831); Schott & Endl. Melet. 14 (1832); Endl. Gen. 76 (1836); Meisn. Gen. 367, II. 275 (1842); R. Br. in Trans. Linn. Soc. XIX. 244 (1842); Benth. & Hook. f. Gen. III. 119 (1880); Engl. & Prantl, Nat. Pflanzenfam. III.-1, p. 280 (1889); Dalla Torre & Harms, Gen. 138, no. 2177 (1900); Post & Ktze. Lex. Gen. 81 (1904); Koorders, Exkursionsfl. Java, II. 179 (1912); Ridley, Fl. Malay Pen. III. 19 (1924); Lemée, Dict. Pl. Phan. I. 675 (1929).—Two or three species in Malaysia.

Standard species: *B. Zippelii* Bl., the original species.

Brugmansia Pers. Syst. I. 216 (1805) belonging to the Solanaceae was adopted by: Hedw. Gen. 103 (1806); Roem. & Schult. Syst. IV. p. xxiii. 307 (1819); Bercht. & Presl, Pfiroz. Rostlin. I. 45 (1823); Reichenb. Consp. 126 (1828); Dumortier, Anal. Fam. Pl. 24 (1829); Lindl. in Bot. Reg. XX. t. 1739 (1835); G. Don, Gen. Syst. IV. 474 (1837); Loisel.-Deslongch. Herb. Gén. Amat. sér. 2, I. t. 11 (1839); Spach, Vég. Phan. IX. 70 (1840); Miers in Ann. Mag. Nat. Hist. sér. 2, III. 164 (1849); Lagerheim in Bot. Jahrb. XX. 662 (1895); Britton, Fl. Bermuda, 339 (1918); Britt. & Wils. Bot. Porto Rico Virg. Isls. VI. 173 (1925); Hochreutiner in Candollea IV. 189 (1930). By other authors as Endl., Benth. & Hook. f., Dunal, Engl. & Prantl, the genus was united with *Datura* and usually distinguished as § *Brugmansia* (Pers.) Bernh.

The conservation of *Brugmansia* Bl. is being advocated by some authors, since it has been generally adopted, but *Brugmansia* Pers. has priority; it has been adopted also by many and is a large and horticulturally important genus, and therefore should not be rejected in favour of *Brugmansia* Bl. The name *Brugmansia* Bl. should be replaced by *Rhizanthus* Dumort. Anal. Fam. Pl. 14 (1829) with the type species *Rh. Zippelii* (Bl.) Spach, Vég. Phan. X. 553 (1841), where Spach gives full generic and specific descriptions (see also Harms in Fedde, Rep. Spec. Nov. XXXVI. 286. 1934). A second synonym, *Zippelia* Reichb. Handb. Nat. Pflanzensyst. 164 (1837) with the species *Z. Brugmansia* Reichb. l. c., is invalidated by *Zippelia* Bl. (1830). Another synonym is *Mycetanthus* Reichb. Repert. Herb. [Deutsch. Bot. I.] 61 (1841) which was taken up by Hochreutiner in Candollea, IV. 187 (1930). See also Harms in Fedde, Repert. xxxvi. 286 (1935).

The name *Pseudodatura* was proposed in 1920 by Van Zipp (in Natuurk. Tijdschr. Ned. Ind. LXXX. 1, p. 24) for *Brugmansia* Pers.; he retains *Brugmansia* Bl. for the reason that it had been in general use for a long time.

3296 **Bucklandia** R. Br. ap. Wallich, Num. List no. 7414 (1832),
nom.; Griffith in As. Research. XIX. 1, p. 94, t. 13 (1836)
versus

Bucklandia Presl in Sternb. Vers. II. p. xxxiii (1825).

Bucklandia Brongn. Prodr. 128 (1828).

Bucklandia R. Br. Hamamelidaceae.

Adopted by: Meisn. Gen. II. 109, 359 (1839); Endl. Gen. 805 (1839); Lam. in Orbigny, Dict. II. 759 (1842); Gardn. in Hook. Kew Gard. Misc. I. 322 (1849); Miq. Sumatra, 132, 346, t. 4 (1860); Benth. & Hook. f. Gen. I. 668 (1865); Hook. f. Fl. Brit. Ind. I. 429 (1879); in Bot. Mag. CVI. t. 6567 (1880); Engl. & Prantl, Nat. Pflanzenfam. III. 2a, p. 121 (1891); ed. 2, XVIII.a 336 (1930); Dalla Torre & Harms, Gen. 205, no. 3296 (1901); Post & Ktze. Lex. Gen. 83 (1904); Brandis, Ind. Trees, 301 (1906); Ridley, Fl. Malay Pen. I. 691 (1922); Le-comte in Bull. Mus. Hist. Nat. Paris, XXX. 392 (1924); Lemée, Dict. Pl. Phan. I. 705 (1929).—Three species in S. Asia and Malaysia.

Standard species: *B. populnea* R. Br. ap. Griff., l. c., the original species.

Bucklandia Sternb., a fossil plant belonging to the Cycadaceae has been taken up by many authors, as by Engl. & Prantl, Nat. Pflanzenfam. II.-1, p. 24 (1889) and Seward, Foss. Pl. III. 480 (1917). It has been referred to *Clathraria* Brongn. by some authors, and may be the same as *Williamsia* Carruthers (1870).

Bucklandia Brongn., a fossil plant belonging to the Liliaceae, has been taken up by Endl. Gen. 257 (1837); Unger, Syn. Pl. Foss.

169 (1845). It has been referred to *Syringodendron* Sternb. (1820).

Considering the fact that *Bucklandia* R. Br. has been universally accepted and has no synonym to take its place, its conservation is recommended.

5062 **Buettneria** Loeffl. It. Hisp. 313 (1758) "*Byttneria*"
versus

Butneria Duh. Arb. I. 113, t. 45 (1755).

Buettneria Loeffl. Sterculiaceae.

The name *Buettneria* has been generally adopted but has been spelled in several different ways as follows:

Byttneria Loeffl., l. c.; Adans. Fam. II. 304 (1763); Jacq. Sel. Stirp. Am. Hist. 76 (1763); Scop. Introd. 251 (1777); Jaume St. Hilaire, Expos. II. 70 (1805); DC. Prodr. I. 486 (1824); G. Don, Gen. Syst. I. 524 (1831); Spach, Vég. Phan. III. 489 (1834); S. Moore in Trans. Linn. Soc. ser. 2, IV. 318 (1895); Ridley, Fl. Malay Pen. I. 286 (1922).

Butneria Linn. Syst. ed. 12, p. 181 (1767); Aubl. Hist. Pl. Guiane, I. 241, t. 96 (1775); Cavan. Diss. V. 290, t. 148 (1788); Schreb. Gen. I. 145 (1789); Neck. Elem. II. 306 (1790); Roxb. Pl. Corom. I. 28, t. 29 (1795); St. Hilaire, Fl. Bras. I. 138 (1825); Brongn. Enum. Pl. Mus. 79 (1843).

Bytneria Jacq. Hort. Vindob. I. 10 (1770).

Büttneria Murray, Syst. 197 (1774); Willd. Spec. I. 1117 (1797); Roem. & Schult. Syst. V. p. xxxvii. 467 (1819); H. B. K. Nov. Gen. V. 314, t. 481 (1821); Pohl, Pl. Bras. II. 69, t. 145-154 (1831); Meisn. Gen. 32, II. 26 (1837); Endl. Gen. 998 (1840); Miq. Fl. Ned. Ind. I.-2, p. 184 (1859); Schum. in Mart. Fl. Bras. XII.-2, p. 83 (1886); Engl. & Prantl, Nat. Pflanzenfam. III.-6, p. 84 (1890).

Buettnera Gmelin, Syst. II. 404 (1791); Ktze. Rev. Gen. I. 76 (1891); Post & Ktze. Lex. 83 (1904).

Büttnera Spreng. Syst. I. 789 (1818); Roxb. Fl. Ind. II. 381 (1824).

Buettneria Benth. & Hook. f. Gen. I. 225 (1862); Oliver, Fl. Trop. Afr. I. 239 (1868); Griseb. Fl. Brit. W. Ind. 92 (1869); Baill. Hist. Pl. IV. 129 (1873); Hook. f. Fl. Brit. Ind. I. 376 (1875); Kurz, For. Fl. Brit. Burma, I. 150 (1877); Baker in Jour. Linn. Soc. Bot. XXII. 451 (1887); Britt. in Bull. Torr. Bot. Club, XVI. 155 (1889); Pierre, Fl. For. Cochinch. III. t. 206-7 (1889); Dalla Torre & Harms, Gen. 312, no. 5062 (1903); Gagnep. in Lecomte, Fl. Gén. Indo-Chine, I. 515 (1911); Koorders, Exkursionsfl. Java, II. 594 (1912); Urban, Symb. Antill. VIII. 431 (1920); Merrill, Enum. Philipp. Fl. Pl. III. 48 (1923); Lemée, Dict. Pl. Phan. I. 708 (1929).—More than 50 species in C. & S. Am., S. Asia and Malaysia.

Standard species: *B. scabra* Loeffl., the original species.

Butneria Duh. belonging to the Calycanthaceae is a synonym of *Calycanthus* L. (1759) which is a nomen conservandum (Règl. Intern. p. 86. 1912). It is also spelled in different ways as *Butneria* Duh. Arb. ed. 2, 217, t. 47 (1801) and *Byttneria* Steud. Nom. ed. 2, I. 243 (1840).

Buettneria, *Butneria* and the various other spellings are all orthographic variants, the genus having been named after D. S. A. Büttner or Buettner (1724-1768).

Considering the fact that *Buettneria* has been almost universally accepted and represents a large and important genus, its conservation is recommended with the spelling *Buettneria* which has been generally adopted during the last 70 years. If not conserved, the name of the genus would become *Chaetaea* Jacq. Enum. 17 (1760) which has been adopted by only few as Morong & Britt. in Ann. N. Y. Acad. Sci. VII. 63 (1892) and Rusby in Mem. Torr. Bot. Club, III. no. 3, p. 10 (1893); VI. 11 (1896).

4331 **Buraeavia** Baill. in Adans, XI. 83 (1873)

versus

Bureava Baill. in Adans. I. 71 (1860).

Buraeavia Baill. Euphorbiaceae.

Adopted by: Baill. Hist. Pl. V. 25 (1874); Benth. & Hook. f. Gen. III. 280 (1880); Engl. & Prantl, Nat. Pflanzenfam. III.-5, p. 32 (1896); Dalla Torre & Harms, Gen. 271, no. 4331 (1901); Post & Ktze. Lex. Gen. 85 (1904) "*Bureaua*."—Two species in New Caledonia.

Standard species: *B. carunculata* (Baill.) Baill. l. c., the older of the two original species.

Bureava Baill. belonging to the Combretaceae has been referred to *Combretum*, its type *B. crotonoides* Baill. being identical with *Croton altum* Guill. & Perr. ap. DC. (1828).

In view of the fact that *Buraeavia* Baill. (1873) has been generally accepted and has no synonym to take its place, its conservation is recommended, if retained as a distinct genus; by Pax & Hoffmann in Engl. Pflanzenr. IV.-147, XV, p. 289 (1922) and by Lemée, Dict. Pl. Phan. IV. 150 (1932), it is included in *Longetia* Baill. (1862).

968 **Burchardia** R. Br. Prodr. 272 (1810)

versus

Burchardia Neck. Elem. II. 76 (1790).

Burchardia R. Br. Liliaceae.

Adopted by: Poir. in Dict. Sci. Nat. V. suppl. 136 (1817); Sprengel, Syst. II. 98 (1825); Roem. & Schult. Syst. VII. p.

xxix, 364 (1829); Endl. Gen. 135 (1837); Meisn. Gen. 404, II. 308 (1842); Kunth, Enum. IV. 164 (1843); Spach, Vég. Phan. XII. 235 (1846); Hook. f. Fl. Tasman. 45 (1860); Benth. Fl. Austral. VII. 33 (1878); Benth. & Hook. f. Gen. III. 822 (1883); F. M. Bailey, Syn. Queensl. Fl. 548 (1883); Engl. & Prantl, Nat. Pflanzenfam. II.-5, p. 28 (1888); F. M. Bailey, Queensl. Fl. V. 1640 (1902); Black, Fl. S. Austral. 806 (1922); Lemée, Dict. Pl. Phan. I. 718 (1929); Ewart, Fl. Victoria, 287 (1930).—One species in Australia and Tasmania.

Standard species: *B. umbellata* R. Br. l. c., the original species.

Burchardia Neck. belonging to the Myrtaceae does not seem to have been taken up by any botanist. It is based on some species of *Psidium*, but no binomial combinations have been made under it. Though the spelling of R. Brown's and Necker's genus is identical, they are probably named after different men. R. Brown named his genus "in mem. Jo. Henr. Burchard"; this is apparently Joh. Heinr. Burckhard who wrote Epistola ad G. G. Leibnitium (1750) and Kuntze therefore changed the spelling to "*Burckhardia*," but F. M. Bailey (l. c.) and Black (l. c.) give "Dr. Henry Burchard" and "J. H. Burchard, M.D., an English botanist"; I have, however, been unable to find any trace of an English botanist of that name. Necker gives no derivation, but he may have named his genus after Ernst Fr. Burchard who wrote "De naturali et optima florum anatome" (1741) or after J. H. Burckhard; the latter may also be the man after whom Schmidel named *Burcardia*, dedicating it to "veri systematis sexualis praecursori," though he spells the name *Burkard*. Kuntze, Rev. Gen. I. 845 (1891) takes up Schmidel's name for *Bulgaria* Fries and spells it *Burckhardia*. There are three other names which may and perhaps should be considered orthographic variants and thus would be invalidated by the conservation of *Burchardia* R. Brown. These are; *Burcardia* Heister ap. Duh. (1755) which is a synonym of *Callicarpa* L. (1753); *Burcardia* Schreb. (1789) which is a synonym of *Piriqueta* Aubl. (1775) and *Burcardia* Schmidel (1797) which is identical with *Bulgaria* Fries (1822). *Burcardia* Schreb. was originally published by Scopoli (1777) as *Burghartia* possibly named after G. H. Burghart, who wrote "Iter sabothicum" (1736), and by Gmelin (1791) changed to *Burcarda*.

In view of the fact that *Burchardia* R. Br. has been generally accepted and the previous homonym or homonyms are synonyms, its conservation is recommended. If not conserved the name of the genus will be *Reya* Ktze. Rev. Gen. I. 845 (1891), adopted by Engl. & Prantl, Nat. Pflanzenfam. Nachtr. 72 (1897); Dalla Torre & Harms, Gen. 61, no. 968 (1900) and Post & Ktze. Lex. Gen. 481 (1904).

5311 *Byrsanthus* Guillem. in Deless. Ic. Sel. III. 30, t. 52 (1837) versus

Byrsanthes Presl, Prodr. Monog. Lobel. 41 (1836).

Byrsanthus Guillem. Flacourtiaceae.

Adopted by: Benth. & Hook. f. Gen. I. 800 (1867); Oliver, Fl. Trop. Afr. II. 498 (1871); Mast. in Jour. Linn. Soc. Bot. XIII. 15 (1873); Engl. & Prantl, Nat. Pflanzenfam. III.-6a, p. 34 (1893); ed. 2, XXI. 424 (1925); Dalla Torre & Harms, Gen. 328, no. 5311 (1903); Post & Ktze. Lex. Gen. 86 (1904); Thonner, Blütenpfl. Afr. 394 (1908); Hutchins. & Dalziel, Fl. W. Trop. Afr. I. 167 (1927); Lemée, Dict. Pl. Phan. I. 730 (1929).—One or two species in W. Afr.

Standard species: *B. Brownii* Guillem., l. c., the original species.

Byrsanthes Presl belonging to the Campanulaceae has been adopted by some early botanists as Reichb. Handb. 186 (1837); Endl. Gen. 512 (1838); A. DC. Prodr. VII.-2, p. 407 (1839); Meisn. Gen. 240, II. 148 (1839); Spach, Vég. Phan. IX. 572 (1840). It is generally referred to *Siphocampylus* Pohl (1831) and by Benth. & Hook. f. Gen. II. 548 (1876) distinguished as sect. *Byrsanthes*, by Schönland in Engl. & Prantl, Nat. Pflanzenfam. IV.-5, p. 66 (1889) as sect. *Byrsanthus*. If maintained as a distinct genus, its name would be *Canonanthus* G. Don, Gen. Syst. III. 718 (1834), which has priority over *Byrsanthes* Presl.

Byrsanthus Guill. and *Byrsanthes* Presl are to be considered orthographic variants of the same derivation and are therefore homonyms.

Considering the fact that *Byrsanthus* Guillem. has been generally accepted, its conservation seems to be desirable. If not conserved the name of the genus would be *Anetia* Endl. Gen. 923 (1839) which was adopted only in a few nomenclators, as Reichb. Nom. 177 (1841); Steudel, Nom. ed. 2, I. 97 (1841); Lindl. Veg. Kingd. 743 (1847).

HOMONYMS NOT NEEDING CONSERVATION.

Adenostoma Hook. & Arn. Bot. Beechey Voy. 139, 338, t. 30 (1841).

Adenostoma Bl. in Flora VIII-2, p. 680 (1825), nom. nud.

Since *Adenostoma* Bl. is a nomen nudum and therefore not legitimately published, the later homonym which is universally adopted does not need conservation.

Alberta E. Mey. in Linnaea, XII. 258 (1838).

Albertia Schimp. & Moug. in Mém. Soc. Strasb. II. no. 3 (Pl. Foss. Vosg.) (1837).

Alberta and *Albertia* can hardly be considered orthographic variants and therefore homonyms, since *Alberta* is named in honor

of Albertus Magnus, while *Albertia* is named probably for Friedr. Aug. von Alberti (1795–1878). Both names, therefore, are legitimate.

A more recent homonym of the latter name, *Albertia* Reg. & Schmalh. (1877), is now generally referred partly to *Trachydium* Lindl. and partly to *Kozlovia* Lipsky; this genus is named for Albert Regel.

Anomospermum Miers in Ann. Mag. Nat. Hist. ser. 2, VII. 39 (1851, Jan.).

Anomospermum Dalz. in Hook. Kew Jour. III. 228 (1851, Oct. or later).

Of the two homonyms published in the same year the generally adopted *Anomospermum* Miers has clear priority, having been published in January, while *Anomospermum* Dalz. could not have been published before October, since in the issue which contains the latter name a letter from Athens, Greece, dated Sept. 15, appears.

Agastachys R. Br. in Trans. Linn. Soc. X. 158 (1810).

Agastachys Ehrh. Beitr. IV. 146 (1789).

Agastachys Ehrh. is a uninomial and therefore not a legitimate generic name; this makes unnecessary the conservation of the generally accepted *Agastachys* R. Br. for which Kuntze proposed *Lippomuelleria* (1891).

Batschia Vahl, Symb. Bot. III. 39, t. 56 (1794).

Batschia J. F. Gmel. Syst. II. 315 (1791).

Batschia Mutis apud Thunb. in Nov. Act. Ups. V. 120 (1792).

Batschia Moench, Meth. 567 (1794).

Batschia Vahl has been adopted by a few recent authors, but is generally referred as a synonym to *Humboldtia* Vahl, Symb. III. 106 (1794) which should be conserved against *Humboldtia* Neck. (1790), and against *Humboldtia* Ruiz & Pav. (1794).

Batschia Gmel. is generally referred to *Lithospermum* L., *Batschia* Mutis to *Abuta* Aubl., and *Batschia* Moench to *Eupatorium* L.; all three had been accepted by a number of earlier authors.

Berzelia Brongn. in Ann. Sci. Nat. sér. 1, VIII. 370 (1826, Aug.)

Berzelia Mart. in Nov. Act. Leop.-Carol. Acad. XIII. 292 (1826).

Both genera were published the same year, but *Berzelia* Mart. probably later than August, and until it is shown that it was published before August, the generally adopted *Berzelia* Brongn. would not need conservation.

Biasoletia Koch in Flora, XIX. 163 (1836, March 21).

Biasoletia Presl, Reliqu. Haenk. II. 141 (1836).

Biasoletia Presl was probably published later than March, and until it is shown that it appeared earlier than the generally accepted *Biasoletia* Koch, the latter needs no conservation.

There is also a *Biasoletia* Bert. (1837) which is generally referred as a synonym to *Physocaulis* Tausch or *Chaerophyllum* L. and a *Biasoletia* Pohl ex Baker (1876) which was published as a synonym under *Eupatorium*.

Billiottia DC. Prodr. IV. 618 (1830).

Billiottia Colla, Hort. Ripul. 20 (1824).

Billiottia DC. has been adopted in some important publications, but it is a synonym of the earlier *Melanopsidium* Colla (1824) which has been accepted by several recent authors. Therefore, it seems advisable to follow the rules and adopt the older name, instead of conserving *Billiottia* DC. *Billiottia* Colla is a synonym of *Calothamnus* Labill. (1806). There are two other homonyms: *Billottia* R. Br. (1832)=*Billotia* G. Don (1832)=*Billiotia* Reichb. (1871) which is a synonym of the conserved name *Agonis* DC., and *Billotia* Schultz Bip. (1841) which is universally referred to *Crepis* L.

The various spellings cited above must be considered orthographic variants, because they are all based on the name of Colla's daughter Tecofila Billotti (ex Colla) or Billiotti (ex DC.) or Billoti (ex G. Don); only *Billotia* Schultz Bip. is probably of different derivation and named for Paul Constant Billot of Rambervillers, Vosges (1796–1863).

Blancoa Lindl. Swan River App. 45 (1839).

Blancoa Bl. Rumphia II. 128 (1836), pro synon.

Since *Blancoa* Bl. was published as a synonym, Lindley's name is legitimate. There is a third homonym *Blancoa* Bl. (1847) which is a synonym of *Harpullia* Roxb.

Boissiera Hochst. & Steud. in Flora XXI.–1, p. 25 (1838).

Boissiera Domb. ex DC. Syst. I. 512 (1818), pro synon.

Since *Boissiera* Domb. was published only as a synonym of *Lardizabala*, the generally accepted *Boissiera* Hochst. & Steud. is legitimate. There is a third homonym, *Boissiera* Haenseler apud Willk. & Lange (1861), which is considered a synonym of *Gagea* Salisb.

Bollea Reichb. f. in Bot. Zeit. X. 667 (1852).

Bollea Klotzsch in Schomb. Reise Brit. Guiana, III. 1206 (1848), nom. nud.

Since *Bollea* Klotzsch is a nomen nudum, *Bollea* Reichb. f. is a legitimate name. A third homonym, *Bollaea* Parl. (1858) is generally retained in *Pancratium* L.

Boutonia DC. in Bibl. Univ. Genève, XVII. 134 (Rev. Bignon.) (1838).

Boutonia Bojer, Hort. Maurit. 282 (1837).

Since *Boutonia* Bojer which is based on *Ricinus integrifolius* Willd. was published without generic description, *Boutonia* DC. is

a legitimate name. By some authors the latter is referred as a synonym to *Periblema* DC. (1839), but *Boutonia* DC. has priority. A third homonym *Boutonia* [Bernhardi, Cat. Pl. Hort. Erfurt. (1799)?] Hort. Erfurt. ex Steud. (1840) also lacks a generic description.

Burtonia R. Br. in Ait. Hort. Kew. ed. 2, III. 12 (1811).
Burtonia Salisb. Parad. Lond. t. 73 (1807).

Burtonia R. Br. is a legitimate name, since the name *Burtonia* Salisb. lacks a generic description; it appears only on the plate as *B. grossularioides*, while in the text the plant is described as *Hibbertia grossularioides* without reference to, or a description of, the genus *Burtonia*.

LETTER C BY C. A. WEATHERBY.

(The author has included some names for conservation other than homonyms. Some of the cases are in the form of a report, no recommendation for conservation or otherwise being made.)

8545 Callistemma (Mert. & Koch) Boiss. Fl. Orient. III. 146 (1875)

versus

Callistemma Cass. Dict. Sci. Nat. VI. Suppl. 45 (1817).

Callistemma Cass. (1817). Compositae.

In 1825, Dict. Sci. Nat. XXXVII. 464, Cassini renamed this genus *Callistephus*, without giving any reason for so doing. The later name has been very generally used and is now conserved.

Callistemma Boiss. (1875). Dipsacaceae.

Accepted by: Höck in Engl. & Prantl, Nat. Pflanzenfam. IV, pt. 4, 189 (1891); Halácsy, Consp. Fl. Graec. I. 763 (1901); Vandas, Reliq. Formánek. 269 (1909); Dalla Torre & Sarnth. Fl. Tirol VI. pt. 3, 423 (1912); Holmboe, Bergens Mus. Skrift (Stud. Veg. Cyprus) I. no. 2, 175 (1914); Stojanoff & Stefanoff in Ann. Arch. Agr. Bulg. V. 1077 (1925).—1 or 2 species, in the Levant.

Standard species: *C. brachiatum* (Sibth.) Boiss., the only original species.

By a few recent authors, as Béguinot in Fiori & Paoletti, Fl. Anal. Ital. III. 149 (1903), *Callistemma* Boiss. has been regarded as synonymous with *Scabiosa*, but most writers on the flora of the region in which it occurs have treated it as a separate genus. Janchen in Oesterr. Zeit. LXVI. 395 (1916) and Hayek in Repert. Spec. Nov. Beih. XXX, pt. 2, 509 (1930) take up for it the earlier name *Tremastelma* Raf. Fl. Tellur. IV. 96 (1836).

Callistemma Cass., though ruled out of use by the conservation of *Callistephus*, remains, under present rules, a bar to *Callistemma* Boiss. If the latter is to be retained, it must be conserved against both *Callistemma* Cass. and *Tremastelma* Raf., which was also founded on *Scabiosa brachiata* Sibth. Since the genus contains only one or two species, the best course would probably be to drop the name *Callistemma* altogether and take up *Tremastelma*.

5669 Cambessedesia DC. Prod. III. 110 (1828)

versus

Cambessedea Kunth in Ann. Sci. Nat. III. 336 (1824).

Cambessedea Kunth (1824). Anacardiaceae.

Accepted by: HBK. Nov. Gen. Sp. VII. 2 (1825); Bartling, Ord. Nat. Pl. 396 (1830); Spach, Vég. Phan. II. 186 (1834). By Endl. Gen. 1134 (1840) and apparently all later authors (as, for instance, Lecomte, Fl. Gén. Indo-Chine II. 8 1908); regarded as a synonym of *Buchanania* Spreng. (1800).

Cambessedesia DC. (1828). Melastomaceae.

Accepted by: Mart. Nov. Gen. & Sp. III. 125 (1829); G. Don, Gen. Syst. II. 738 (1832); Cham. in Linnaea IX. 381 (1834); Spach, Vég. Phan. IV. 216 (1835); Meisn. Pl. Vasc. Gen. 114 (1838); Endl. Gen. 1208 (1840); Walp. Repert. II. 120 (1843) (*Cambessedia*); Naud. in Ann. Sci. Nat., sér. 3, XV. 60 (1851); Benth. & Hook. Gen. Pl. I. 737 (1867); Triana in Trans. Linn. Soc. XXVIII. 24 (1871); Baill. Hist. Pl. VII. 43 (1880); Cogn. in Mart. Fl. Bras. XIV, pt. 3, 10 (1883) and in DC. Monog. Phanerog. VII. 15 (1891); Krasser in Engl. & Prantl, Nat. Pflanzenfam. III. pt. 7. 160 (1893); Löfgren, Man. Fam. Nat. Phanerog. Bras. 385 (1919)—Sp. 15, Brazil.

Standard species: *C. hilariana* (Kunth) DC. (*Rhexia hilariana* Kunth) apparently the best-known of the original species.

Cambessedea and *Cambessedesia* were both named for Jacques Cambessedes; they should, therefore, be regarded as variant spellings of the same word and hence homonyms. Since *Cambessedea* Kunth has been little used at any time and apparently not at all in recent years, the universally accepted *Cambessedesia* DC. should be conserved.

6726 Camptocarpus Decne. in DC. Prod. VIII. 493 (1844)

versus

Camptocarpus Koch in Linnaea XVII. 304 (1843).

Camptocarpus Koch (1843), Boraginaceae, has been very generally regarded as a synonym of *Alkanna* Tausch (1824).

Camptocarpus Decne. (1844). Asclepiadaceae.

Accepted by: Lindl. Veg. Kingd. 626 (1847); Benth. & Hook. Gen. Pl. II. 744 (1876); Baillon, Hist. Pl. X. 294 (1891); K. Schumann in Engl. & Prantl, Nat. Pflanzenfam. IV, pt. 2. 215 (1895); Cordemoy, Fl. Ile Réunion 484 (1895); Palacky, Cat. Pl. Madagascar. III. 33 (1907); Choux, Cat. Pl. Madagascar. Asclep. 5 (1931).—4 species, Madagascar, Mauritius.

Standard species: *C. mauritiana* (Poir.) Decne., founded on *Periploca mauritiana* Poir., the first described of the species referable to the genus.

The generally accepted *Camptocarpus* Decne. has no synonyms and, unless conserved, must be renamed.

2684 *Cananga* Hook. f. & Thoms. Fl. Ind. I. 129 (1855)
versus

Cananga Aubl. Hist. Pl. Guian. Franç. I. 607 (1775).

Fitzgeraldia F. v. Muell. Fragm. Phyt. Austral. VI. 1 (1867).

Canangium Baill. Hist. Pl. I. 213 (1868).

Cananga Aubl. (1775). Annonaceae.

Accepted by Jussieu, Gen. Pl. 284 (1789) and by a few other early authors, but generally considered synonymous with *Guatteria* R. & P. (1794). It has, however, been taken up on the ground of priority by Warming, Vidensk. Meddel. V. 144 (1873) and Britton & Wilson, Sci. Survey Porto Rico & Virgin Isls. V. 310 (1924).

Cananga Hook. f. & Thoms. (1855). Annonaceae.

Accepted by: Benth. & Hook. Gen. Pl. I. 24 (1862); Hook. f. & Thoms. Fl. Brit. Ind. I. 56 (1872); Kurz, For. Fl. Burma I. 32 (1877); Prantl in Engl. & Prantl, Nat. Pflanzenfam. III, pt. 2. 33 (1888); Dalla Torre & Harms, Gen. Siphonog. 173 (1901); Prain, Bengal Pl. I. 202 (1903); Finet & Gagnepain in Lecomte, Fl. Gen. Indo-Chine I. 63 (1907); Koorders, Excursionsfl. Java II. 247 (1912); Diels in Bot. Jahrb. XLIX. 128 (1912).—Sp. 3, Oriental tropics.

Standard species: *C. odorata* (Lam.) Hook. f. & Thoms. (*Uvaria odorata* Lam.), the only species originally cited.

Fitzgeraldia F. v. Muell. (1867). Annonaceae.

Apparently generally regarded as a synonym of the preceding.

Canangium Baill. (1868). Annonaceae.

Proposed as a substitute for *Cananga* Hook. f. & Thoms. because of *Cananga* Aubl. Accepted by: King, Mat. Fl. Malay Penins. 289 (1892); Brandis, Indian Trees 16 (1911); Merrill, Interpret. Rumph. Herb. Amboin. 226 (1917) and Enum. Philipp. Pl. II. 158 (1923); Ridley, Fl. Malay Penins. I. 43 (1922); Domin in Bibl. Bot. XXII. 670 (1925).

Both Aublet and Hooker & Thomson apparently took the name *Cananga* from Rumphius. Aublet applied it to an American species not congeneric with the Old World species described by Rumphius; but, since his is the first use of the name after 1753, it must stand, with *C. Ouregou* Aubl. (*Guatteria Ouregou* Dunal) as standard species. *Guatteria* R. & P. (1794) has been conserved against *Cananga* Aubl.

R. Fries in Sv. Vetenskaps-Akad. Handl. XXXIV. 12 (1900) cites *Cananga* Rumph. as published in Herb. Amboin. Auct. index (1755). The entry there is: "Cananga 1. 3. c. 19. t. 2. *Uvaria* L." It might be argued that the citation of *Uvaria* associates *Cananga* with a description and constitutes publication, but this seems doubtful. There is no reference by Rumphius in the text of Herbarium Amboinense to *Uvaria* or any other Linnaean genus; Burmann, who edited the Auctuarium, seems to have inserted in the index what he regarded as Linnaean equivalents of Rumphius's names. Even if published here, *Cananga* would be illegitimate, since it is stated to be a synonym of *Uvaria*.

Since *Cananga* Hook. f. & Thoms. has been widely used and its standard species is much cultivated and of some economic importance, it should probably be conserved. If the substitute *Canangium* is to be used, it must apparently itself be conserved against *Fitzgeraldia*.

7157 *Casselia* Nees & Mart. in Nov. Act. Acad. Leop.-Carol. XI. 73, t. 6 (1823)

versus

Casselia Dumort. Comm. Bot. 21 (1822).

Casselia Dumort. (1822). Boraginaceae.

This is a direct substitute for *Mertensia* Roth, Catalect. I. 34 (1797). Roth's genus is cited as a synonym, the diagnosis closely parallels his and his single species is included. This should dispose of *Casselia* Dumort. but under present rules, though it cannot be used itself, it displaces the generally accepted *Casselia* Nees & Mart.

Casselia Nees & Mart. (1823). Verbenaceae.

Accepted by: Endl. Gen. 634 (1838) and all general works since; Schauer in Mart. Fl. Bras. IX. 173 (1851); Bocquillon in Adansonia III. 237 (1862).—Species about 6 from Brazil.

Standard species: *C. serrata* Nees & Mart., the first mentioned and the more completely described and illustrated of the two original species.

Casselia N. & M., which has no synonyms, should be conserved.

4118 *Castela* Turp. in Ann. Mus. Paris VII. 78, t. 5 (1806)
versus
Castelia Cav. Anal. Cienc. Nat. III. 134, t. 30 (1801).

Castela Turp. is generally accepted for an American genus of *Simarubaceae* of about 10 species and has no synonyms. *Castelia* Cav. is generally regarded as a synonym of *Priva* Adans. (1763). The two were named for different persons, Turpin's genus for René Richard Castel, said to have been "auctor poematis de plantis," Cavanilles' for Juan de Deo Castél, a draughtsman who accompanied Loeffling on his expeditions. The two are, however, so similar in sound as to be a possible source of confusion: and *Castela* Turp. has been spelled *Castelia* by Liebmann, Vidensk. Meddel. 1853. 108 (1854). It may be well to conserve *Castela* Turp.

Catenaria Sorokin in Ann. Sci. Nat. sér. 6, IV. 67 (1876)
versus
Catenaria Roussel ex Desv. Journ. Bot. III. 144 (1813).
Catenaria Sternb. Versuch Fl. Vorwelt I, pt. 4, p. xxv. (1825).
Catenaria Benth. Pl. Junghuhn. 220 (1852).

Catenaria Roussel (1806?). Ceramiaceae?
Apparently attributed by Desvaux to Fl. Calvados (1806), but I do not find the name in that work. Other publications of Roussel are not accessible here. As given by Desvaux, *Catenaria* is a nomen nudum; he makes it a synonym of *Ceramium* Agardh.

Catenaria Sternb. (1825)—"Filicites anomalae."
Original publication not seen. The name appears not to have been used by paleobotanists.
Standard species: (fide Pfeiffer), *C. decora* Sternb. op. cit. t. 52 f. 1.

Catenaria Benth. (1852). Leguminosae.
Adopted by: Miquel Fl. Ind. Bat. I. 256 (1855); C. Muell. Ann. Bot. Syst. IV. 544 (1857). By most later authors it is treated as a subgenus of *Desmodium*—e.g. Bentham & Hook. Gen. I. 520 (1865); Boerlage, Fl. Ned. Ind. I. 360 (1890); Engl. & Prantl, Nat. Pflanzenfam. III, pt. 3. 328 (1894). It has, however, recently been revived by Schindler in Rep. Spec. Nov. XX. 275 (1924).

Standard species: *C. caudata* (Thunb.) Schindler (*C. laburnifolia* Benth.), the original and only species.

Catenaria Sorokin (1876). Chytridiaceae.
Adopted by: Saccardo, Syll. Fung. IX. 360 (1891); Clements and Shear, Gen. Fung. 235 (1931).
Standard species: *C. Anguillulae* Sorok.

Probably neither *Catenaria* Benth., nor *Catenaria* Sorok., being very small genera, and in the case of the former, not generally recognized, is worth conserving. At least the former must be renamed if not conserved, since *Catenaria* Sternb. appears to have been validly published, and *Catenaria* Roussel may have been.

7310 *Ceranthera* Ell. Sketch Bot. So.-Car. II. 93 (1822)
versus
Ceranthera Beauv. Fl. d'Oware II. 11 (1805).
Ceranthera Raf. Am. Monthly Mag. II. 176 (1818).

Ceranthera Beauv. (1805). Violaceae.
Accepted by: Roem. & Schult. Syst. Veg. V. 472 (1819); DC. Prod. I. 313 (1824); G. Don, Gen. Syst. I. 341 (1831); Meisn. Pl. Vasc. Gen. 21 (1837); Hook. f. & Benth. in Hook. Niger Flora 221 (1849). Endlicher, Gen. 911 (1839) reduced it to synonymy under *Alsodeia* and has been followed apparently by all authors subsequent to 1850.

Ceranthera Raf. (1818). Solanaceae.
This is a nomen nudum, published without a description and apparently never accepted or validated by any one.

Ceranthera Ell. (1822). Labiatae.
Accepted by: Spreng. in L. Gen. Pl., ed. 9, II. 467 (1831); Darby, Bot. So. States 205 (1841), and ed. 2. 466 (1855); Benth. & Hook. Gen. Pl. II. 1191 (1876); Gray, Synopt. Fl. N. Am. II, pt. 1. 365 (1878); Chapman, Fl. So. U. S., ed. 3. 380 (1897); Briquet in Engl. & Prantl, Nat. Pflanzenf. IV, pt. 3. 304 (1896); Dalla Torre & Harms, Gen. Siphonog. 443 (1904); Lemée, Dict. Gen. Pl. Phanerog. II. 34 (1930).—Species 2 or 3, southeastern United States.

Standard species: *C. linearifolia* Ell. the only original species.

Bentham, Bot. Reg. sub t. 1300 (1829) substituted the name *Dicerandra* for *Ceranthera* Ell., because of the earlier *Ceranthera* Beauv. He maintained *Dicerandra* in Lab. Gen. Sp. 413 (1834) and in DC. Prod. XII. 242 (1848). He has been followed by G. Don, Gen. Syst. IV. 789 (1837); Endl. Gen. 620 (1838); Meisn. Pl. Vasc. Gen. 285 (1840); Chapman, Fl. So. U. S. 318 (1860) and ed. 2. 318 (1883); and Small, Fl. S. E. U. S. 1044 (1903) and Man. s. e. Fl. 1169 (1933).

If *Ceranthera* Ell. is to be maintained, it must be conserved. It would seem as well, however, to take up *Dicerandra*, a name which was properly substituted for *Ceranthera* Ell. because of the earlier homonym, which has had a certain amount of usage and under which all needful combinations have been made.

4954 **Ceratosepalum** Oliv. Icon. Pl. XXIV. t. 2307 (1894)

versus

Ceratosepalum Oerst. L'Amér. Cent. 18, t. 17 (1863).

Ceratosepalum Oerst. (1863). Passifloraceae.

Published without description but with a plate and analyses ; generally regarded as a synonym of *Passiflora* L.

Ceratosepalum Oliv. (1894). Tiliaceae.

Accepted by : Engl. Pflanzenw. Ost-Afrika pt. C. 262 (1895) ; K. Schumann in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. 233 (1897) ; Dalla Torre & Harms, Gen. Siphonog. 305 (1901) ; Lemée, Dict. Gen. Pl. Phan. II. 43 (1931).—Sp. 1, trop. Africa.

Standard species : *C. digitatum* Oliv., the original and still the only species.

If *Ceratosepalum* Oliv., which has no synonyms, is to be retained, it must be conserved.

4467 **Chaetocarpus** Thwaites in Hooker's Journ. Bot. & Kew Gard. Misc. VI. 300, t. 10A (1854)

versus

Chaetocarpus Schreb. L. Gen. Pl. ed. 8, 75 (1789).

Chaetocarpus Schreb. (1789). Sapotaceae.

† This is a direct renaming of *Pouteria* Aubl. (1775). Aublet's name is cited as a synonym and his diagnosis is partly quoted verbatim and is very closely followed throughout.

Chaetocarpus Thwaites (1854). Euphorbiaceae.

Accepted by the authors of practically all floras dealing with the region in which it occurs, and in all general works up to the present time. The single exception noted is O. Kuntze, who took up *Gaedawakka*, a name used by Linnaeus, Fl. Zeyl. 203 (1747) but later discarded by him, and not used by any author subsequent to 1753 until revived by Kuntze. *Chaetocarpus* Thw. has one synonym, *Regnaldia* Baill. Adansonia I. 187 (1860).—Species about 10, in the tropics of both hemispheres.

Standard species : *C. castanocarpus* (Roxb.) Thwaites, Enum. Pl. Zeyl. 275 (1858). In the original publication of the genus, Thwaites cited a supposed new species, *C. pungens* Thw. He later discovered that he had described the flowers of one species and the fruit of another, and that the flowers belonged to a species already named, *Adelia castanocarpa* Roxb. In his Enumeratio he therefore abandoned *C. pungens*, as a *nomen confusum*, took up *C. castanocarpus* for one element and gave a new name to the other. The former, a rather widely distributed and well-known species, seems best taken as the standard.

Chaetocarpus Thwaites should be conserved. It is unreasonable that a completely illegitimate name like *Chaetocarpus* Schreb. which cannot itself be used, should prevent the use of the later, valid and generally accepted name.

8843 **Chiliophyllum** Phil. in Linnaea XXXIII. 132 (1864)

versus

Chiliophyllum DC. Prod. V. 554 (1836).

Chiliophyllum DC. (1836). Compositae.

Accepted by : Endl. Gen. 408 (1838) ; Meisn. Pl. Vasc. Gen. 200 (1839) ; Brongn. Enum. Gen. Pl. 42 (1843) ; Lindl. Veg. Kingd. 711 (1847). By most authors considered a synonym of *Zaluzania* Pers. (1807).

Chiliophyllum Phil. (1864). Compositae.

Accepted by : Benth. & Hook. Gen. Pl. II. 258 (1873) ; O. Hoffm. in Engl. & Prantl, Nat. Pflanzenfam. IV, pt. 5. 149 (1890) and in Dusén, Sv. Exped. Magellanslând, III, no. 5. 96 (1900) ; Reiche, Fl. Chile III. 277 (1902) ; de Wildem. Phan. Terres Magellan. 156 (1905) ; Macloskie, Rep. Princéton Univ. Exp. Patagonia VIII. 787 (1905) ; Dalla Torre & Harms, Gen. Siphonog. 529 (1905) ; Lemée, Dict. Gen. Pl. Phanerog. II. 104 (1930).—2 species, Chile & Patagonia.

Standard species : *C. densifolium* Phil. the only species originally cited.

Chiliophyllum Phil. which has no synonyms, must be conserved or renamed.

3959 **Chitonía** Moc. & Sessé apud DC. Prod. I. 707 (1824)

versus

Chitonía D. Don in Mem. Werner. Soc. Edinburgh, IV. 317 (1823).

Chitonía D. Don (1823). Melastomataceae.

Renamed *Diplochita* by DC. Prod. III. 176 (1828) because of *Chitonía* Moc. & Sessé, which he had accepted. Under de Candolle's name accepted by Endlicher, Gen. 1219 (1840) and by various other authors up to 1851, when Naudin in Ann. Sci. Nat. sér. 3, XVI. 117, reduced it to sectional rank under *Miconia*. This disposition of it has been accepted by Benth. & Hook. Gen. Pl. I. 764 (1868) ; Cogn. in Mart. Fl. Bras. XIV, pt. 4. 238 (1887) and in DC. Monog. Phanerog. VII. 733 (1891) ; Krasser in Engler & Prantl, Nat. Pflanzenfam. III, pt. 7. 187 (1893) (under the generic name *Tamonea*) ; Dalla Torre & Harms Gen. Siphonog. 357 (1903) ; and most other authors.

Chitonía Moc. & Sessé (1824). Zygophyllaceae.

Generally accepted since its publication.

Standard and only original species : *C. mexicana* Moc. & Sessé, l. c.—About 3 species in Mexico.

Chitonía Moc. & Sessé was renamed *Morkillia* Rose & Painter, Smiths. Misc. Collect. L. 33 (1907) because of *Chitonía* D. Don. It has no other synonyms. Since the genus is small, this renaming should probably stand. It may be pointed out, however, that the name *Chitonía* D. Don (itself proposed as a substitute for *Fothergilla* Aubl., not L.) can hardly be used even if the genus to which it pertains be re-established. *Tamonea* Aubl. (1775) is generally regarded as synonymous with it.

S166A **Chloridion** Stapf in Hook. Icon. Pl. t. 2640 (1900)
versus
Chloridium Link, Obs. Mycol. I. 11 (1809)

Chloridium Link (1809). Dematiaceae.

Accepted: by Nees, Syst. 66 (1817); Agardh, Aphor. Bot. 81 (1821); Dumort. Comm. Bot. 70 (1822); Fries, Pl. Homon. 181 (1825); Spreng. Syst. IV. 553 (1827); Corda, Ic. Fung. I. 17 (1839); Rabenh. Krypt. I. 74 (1844) and others down to Saccardo, Syll. Fung. IV. 320 (1886), Lindau in Engl. & Prantl, Nat. Pflanzenfam. I, pt. 1**, 468 (1900) and Clements & Shear, Gen. Fung. 393 (1931).

Chloridion Stapf (1900). Gramineae.

Accepted by: Dalla Torre & Harms, Gen. Siphon. 589 (1906); Stapf in Prain, Fl. Trop. Afr. IX. 480 (1919).

Chloridium Link is a generally accepted genus of some 20 species; mostly European.

Chloridion Stapf, with a single African species, should be renamed, its name being a variant spelling of *Chloridium*.

Chlorocaulum Clem. Gen. Fung. 78, 175 (1909)
versus

Chlorocaulon Kl. apud Endl. Gen. Suppl. IV, pt. 3. 89 (1850).

Chlorocaulon Klotzsch (1850). Euphorbiaceae.

Accepted by Baill. Étude Gén. Euphorb. 479 (1858); otherwise generally regarded as a synonym of *Argithamnia* or of *Chiro-petalum*.

Chlorocaulum Clem. (1909). Cladoniaceae.

Maintained by Clem. & Shear, Gen. Fung. 320 (1931); not mentioned by Zahlbruckner in Engl. & Prantl, Nat. Pflanzenfam. ed. 2, VIII (1926).

Standard species: *Ch. salazinum* (Bory) Clem., the only species originally cited.

If *Chlorocaulum* Clem. is to be retained it must apparently be conserved.

4065 **Chloroxylon** Scop. Introd. Hist. Nat. 208 (1777)

versus

Chloroxylum P. Br. Nat. Hist. Jamaica. 187, t. 7, f. 1 (1756).

Chloroxylum P. Br. (1756). Rhamnaceae.

Accepted by Adans. Fam. Pl. II. 303 (1763). Thereafter, though its single species is a well-known timber-tree in Jamaica, it remained a genus incertae sedis, not even mentioned by Bentham & Hooker, until in 1889, good specimens having been received at Kew, it was placed by Oliver in *Zizyphus* (Kew Bull. (1889) 127). It was, however, not mentioned by Engler & Prantl and is still listed among genera incertae sedis by Dalla Torre & Harms.

Chloroxylon Scop. (1775). Rutaceae.

Accepted by: DC. Prod. I. 625 (1824); A. Juss. in Mém. Mus. Paris XIX. 252 (seors. 100) (1830); Wight & Arn. Prod. Fl. Ind. Or. I. 123 (1834); Endl. Gen. 1054 (1840) and generally since.—Species 1, in India.

Standard species: *C. Swietenia* DC. (*Swietenia Chloroxylon* Roxb.).

Chloroxylum P. Br. has no generic description. Since, however, its single species is described as new, it may be regarded as technically published under Art. 43 of the Rules of 1930, even though, with a lack of coördination not uncommon in Browne's work, the accompanying plate is labelled *Laurus Chloroxylon* (the name later taken up by Linnaeus). In any case *Chloroxylum* P. Br. was duly published by Adanson in 1763. Since *Chloroxylon* is obviously a variant spelling of the same word, Scopoli's genus must be conserved or renamed. It has no synonyms.

If *Chloroxylum* P. Br. (1756) is regarded as properly published, *Zizyphus*, a later synonym, should be conserved against it. If *Chloroxylum* dates from Adanson (1763), it is sufficiently disposed of by Oliver's reduction of it to synonymy under *Zizyphus*, published in the same work.

6828 **Choristigma** F. Kurtz, Pharm. Post XXX. 443 (1897)

versus

Choristigma Baill. Hist. Pl. XI. 454 (1892).

Choristigma Baill. (1892). Loranthaceae.

Baillon here raised to generic rank a sectional name of his own under *Schoepfia*: (Adansonia III. 117 1864) and substituted it for *Tetrastylidium* Engl. in Mart. Fl. Bras. XII, pt. 2. 33 (1872). Apparently no one has accepted his name.

Choristigma F. Kurtz (1897). Asclepiadaceae.

Accepted by: Dalla Torre & Harms, Gen. Siphonog. 414 (1904).

By K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. III. 302 (1908) regarded as a synonym of *Morrenia* from which it is a segregate.—1 species in Argentina.

Standard species: *C. Stuckertianum* F. Kurtz.

Choristigma Baill. is, in the generic category, a substitute for the earlier *Tetrastylidium* and therefore illegitimate, though, as the name of a section, it antedates Engler's genus. *Choristigma* F. Kurtz, on the other hand, has not yet won general acceptance. It was renamed *Stuckertia* by Post & Kuntze, Lexikon 541 (1903) because of *Choristigma* Baill. This renaming may well stand.

Chrysotrix Mont. in Ann. Sci. Nat., ser. 3, XVIII. 312 (1852)
versus

Chrysotrix Schult. Mant. II. 6 and 144 (1824).

? *Chrysithrix* L. Mant. II. 165 (1771).

Chrysithrix L. (1771) is a generally accepted genus of Cyperaceae, with two or three species in South Africa.

Chrysotrix Schult. (1824) is a substitute spelling of *Chrysithrix* L., which is used, in that form, in R. & S. Syst. II. 7 and 249 (1817).

Chrysotrix Mont. (1852). Chrysotrichaceae.

Accepted by: Cl. Gay, Hist. Chile Bot. VIII. 212 (1852); Zahlbruckner in Engl. & Prantl, Nat. Pflanzenfam. I, 1*. 117 (1905) and ed. 2, VIII. 135 (1926); Clem. & Shear, Gen. Fung. 316 (1931).

Standard species: *C. noli-tangere* Mont. the original and still the only species.

Chrysotrix Mont. was proposed for conservation in 1930 against *Peribotryon* Fries (1832). This, of course, would also maintain it against *Chrysotrix* Schult., which, though illegitimate, would, under present rules, prevent a later use of the name, unless through conservation.

If *Chrysotrix* and *Chrysithrix* are regarded as variant spellings of the same word, Montagne's name should not displace the much older and generally accepted *Chrysithrix* L., and therefore should not be conserved.

Cienkowskia Rostaf. Versuch Syst. Mycetozen 9 (1873)
versus

Cienkowskya Regel & Rach, Ind. Sem. Hort. Petrop. (1858) 48.

Cienkowskya Schweinf. Beitr. Fl. Aethiop. 197 (1867).

Cienkowskya Regel & Rach (1858).

A monotypic genus of unknown origin described from a living specimen in the botanic garden at St. Petersburg and by the authors referred to the "Celastrineae." Bentham & Hooker,

Gen. Pl. I. 997 (1867) pointed out that the description did not fit Celastraceae. It was placed in Boraginaceae, tribe Cordieae, by Durand, Ind. Gen. Phanerog. 281 (1888) and listed under that family, as a genus incertae sedis by Gürke in Engl. & Prantl, Nat. Pflanzenfam. IV, pt. 3a. 377 (1897). According to Baillon in Bull. Soc. Linn. Paris no. 16. 122 (1877), the genus should be regarded as a synonym of *Patagonula* L.

Cienkowskya Schweinf. (1867). Zingiberaceae.

Solms-Laubach, who supplied the text for Zingiberaceae in Schweinfurth's Beiträge, was doubtful as to the validity of this genus. It was accepted by J. D. Hooker, Curt. Bot. Mag. 2. 5994, but is generally regarded as a synonym of *Kaempferia* L.

Cienkowskia Rostaf. (1873). Physaraceae.

Accepted by: Saccardo, Syll. Fung. VII. 329 (1888); Schröter in Engl. & Prantl, Nat. Pflanzenfam. I. pt. 1. 33 (1892); Jahn in op. cit., ed. 2. II. 329 (1928), etc.

Standard species: *C. reticulata* (Alb. & Schw.) Rostaf., the original and still the only species.

If *Cienkowskia* Rostaf. is to be retained, it must be conserved because of the two earlier homonyms.

1569 **Claderia** Hook. f. Fl. Brit. Ind. V. 810 (1890)
versus

Claderia Raf. Sylv. Tellur. 12 (1838).

Claderia Raf. (1838). Meliaceae?

Genus incertum et obliviscendum. Rafinesque apparently had no knowledge of the single species described except what he gleaned from the brief account of "Carabou" in Lam. Encycl. I. 612 (1785). The data there given indicate that the plant concerned was *Melia Azadirachta* L.

Claderia Hook. f. (1890). Orchidaceae.

Accepted by: Pfitzer in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. 104 (1897); Dalla Torre & Harms, Gen. Siphonog. 99 (1900); Ridley, Mat. Fl. Malay Penins. I. 136 (1907) and Fl. Malay Penins. IV. 140 (1924); Schlechter, Orchid., ed. 2, 243 (1927); Lemée, Dict. II. 177 (1930).—One or two species, Malay Peninsula to New Guinea.

Standard species: *C. viridiflora* Hook. f., the only original species.

Claderia Hook. f., which has no synonym, should probably be conserved. Rafinesque's genus, though technically published, must apparently be synonymous with *Melia* L., *Azadirachta* Juss. (1830), or *Murraya* L.; and it represents a kind of pseudo-scientific work, the nomenclatural results of which may well be legislated out of existence.

Cladochaete Sacc. Ann. Myc. X. 318 (1912)

versus

Cladochaeta DC. Prodr. VI. 245 (1837).

Cladochaeta DC. (1837). Compositae.

Adopted by: Endl. Gen. 447 (1838); Meissn. Pl. Vasc. Gen. 219 (1839); Fenzl in Flora XXII. Pt. 2. 727 (1839); Ledeb. Fl. Ross. II. 615 (1845); Lindl. Veg. Kingd. 713 (1847); Boiss. Fl. Orient. III. 228 (1875) (but with doubt); Radde, Fauna & Fl. Südw. Caspi-Gebiet. 386 (1886); Sommier & Levier, Enum. Pl. Caucas. 228 (1900). Regarded as a synonym of *Helichrysum* Gaertn. by Benth. & Hook. Gen. Pl. II. 310 (1873); Baillon, Hist. Pl. VIII. 174 (1886); Hoffmann in Engl. & Prantl, Nat. Pflanzenfam. IV, pt. 5. 190 (1890); Dalla Torre & Harms, Gen. Siphonog. 539 (1905).

Cladochaete Sacc. (1912). Phomaceae.

Adopted by Clem. & Shear, Gen. Fung. 361 (1931).

Standard species: *C. setosa* (Wint.) Sacc.

Although *Cladochaeta* DC. has been reduced to synonymy in most general works, it has been and is likely still to be, used by Russian authors. *Cladochaete* Sacc. should be renamed.

1937 **Clarisia** R. & P. Fl. Peruv. et Chile Prod. 128, t. 28 (1794)

versus

Clarisia Abat in Act. Soc. Med. Sevilla X. 418 (1792) acc. to Dalla Torre & Harms.

Clarisia Abat (1792).. Caryophyllaceae.

Placed by Sprengel, L. Gen. Pl. ed. 9, I. 202 (1830) in synonymy under *Anredera* Juss. (1789). He has apparently been followed by all subsequent authors who have noticed the name at all.

Clarisia R. & P. (1794). Moraceae.

A generally accepted genus.—Species 4, Peru and Brazil.

Standard species: *C. racemosa* R. & P. Syst. Veg. Fl. Peru et Chil. I. 255 (1798).

I have not seen Abat's publication. If the date is correctly given by Dalla Torre & Harms and the genus adequately published, *Clarisia* R. & P. must be conserved if it is to be retained. It has one reported synonym, *Soaresia* Fr.-Allem. (1858)—an earlier homonym of the accepted *Soaresia* Sch.-Bip. (1863) and likely to be displaced by conservation.

7866 **Codonanthe** (Mart.) Hanst. in Linnaea XXVI. 209 (1854)

versus

Codonanthus G. Don, Gen. Syst. IV. 166 (1837).

Codonanthus Hassk. in Flora XXV. Beibl. II. 24 (1842).

Codonanthus G. Don (1837). Loganiaceae?

Listed by Endl. Gen. Pl. 1395 (1840) and DC. Prod. IX. 37

(1845) as a genus dubium. By Planchon in Hook. Icon. Pl. sub t. 796 (1848) placed in Convolvulaceae, and redescribed with considerable changes from the original diagnosis. By Benth. in Hook. Niger Fl. 469 (1849) and Baker & Rendle in Thiselton-Dyer, Fl. Trop. Africa IV, pt. 2. 82 (1905) reduced to synonymy under *Prevostea*; by Benth. & Hook. Gen. Pl. II. 877 (1876) put under *Breweria*. Not mentioned by Engler & Prantl. By Dalla Torre & Harms, following a suggestion of Radlkofer, Abh. Naturw. Ver. Bremen VIII. 413 (1883), treated as a synonym of *Coinochlamys* T. Anders. (1876).

Codonanthus Hassk. (1842). Asclepiadaceae.

A nomen nudum, reduced by Hasskarl himself, Cat. Hort. Bogor. 126 (1844) to his *Cystidianthus* because of *Codonanthus* G. Don.

Codonanthe (Mart.) Hanst. (1854) Gesneriaceae (*Hypocyrtia* § *Codonanthe* Mart.) Nov. Gen. et Sp. III. 49 (1829).

Accepted by: Lemaire, Ill. Hort. II. sub t. 56 (1855); Oerst. Gesnerac. Cent. Am. 54 (1858); Benth. & Hook. Gen. Pl. II. 1011 (1876); Fritsch in Engl. & Prantl, Nat. Pflanzenfam. IV, pt. 3b. 171 (1894); Urban, Symb. Ant. II. 364 (1901); Dalla Torre & Harms, Gen. Siphonog. 475 (1904); Fritsch in Engl. Bot. Jahrb. XXXVII. 491 (1906); Lemée, Dict. Gen. Phan. II. 228 (1930).—Species about 10 from tropical America.

Standard species: *C. aggregata* (Mart.) Hanst. l. c. (*Hypocyrtia aggregata* Mart.).

Codonanthe and *Codonanthus* are probably to be considered variant spellings of the same word. The Greek *κνθη* is regarded by lexicographers as "a peculiar Attic form" of the usual *κνθος*. *Codonanthus* G. Don is, after nearly a century, still a doubtful genus. Unless the two can be regarded as different words, the generally accepted *Codonanthe* Hanst. should probably be conserved.

4899 **Colletia** Comm. apud Juss. Gen. 380 (1789)

versus

Colletia Scop. Introd. Hist. Nat. 207 (1777).

Colletia Scop. (1777). Ulmaceae.

Apparently accepted by no one. Based on *Rhamnus iguanaea* Jacq., which is a *Celtis*.

Colletia Comm. ex Juss. (1789). Rhamnaceae.

A generally accepted genus of 10-20 species in South America.

Standard species: *C. spinosa* Lam. Encycl. Tabl. II. 91 (1793). This is the earliest species described under the genus; Lamarck cites the same collections of Commerson and Jos. Jussieu, from which, according to Jussieu's statement, the original description of the genus was

drawn up. It is, therefore, a particularly suitable standard species. It is, moreover, well known in cultivation.

Colletia Comm., generally accepted, with no synonyms, and including several cultivated species, should be conserved.

3246 *Colmeiroa* F. Muell. Fragm. Phytogr. Austral. VII. 149 (1871)

versus

Colmeiroa Reut. apud Boiss. & Reut. Diagn. Pl. Nov. Hispan. 23 (1842); Mém. Soc. Phys. Genève X. 240, t. 6 (1843).

Colmeiroa Reut. (1843). Euphorbiaceae.

Accepted by: Meisn. Pl. Vasc. Gen. Comment. 370 (1843); Brongn. Enum. Gen. Pl. Hort. Paris 81 (1843); Endl. Gen. Pl. Suppl. III. 99 (1843); Baill. Étude Gén. Euphorb. 552 (1858); Cutanda, Fl. Compend. Madrid. 595 (1861); Lange, Pugillus Pl. Hispan. 319 (1865). Mueller Argovensis, Prod. XV, pt. 2, 446 (1862), reduced it to synonymy under *Securinega* and has been followed by most later authors.—1 species in Spain.

Standard species: *C. buxifolia* (Poir.) Reut.

Colmeiroa F. Muell. (1871). Saxifragaceae.

Accepted by: Engl. in Engl. & Prantl, Nat. Pflanzenfam. III, pt. 20. 87 (1890); Dalla Torre & Harms, Gen. Siphonog. 202 (1901); Lemée, Dict. Gen. Pl. Phan. II. 257 (1930).—1 species, Lord Howe Island.

Standard species: *C. carpodetoides* F. Muell. the only species.

Colmeiroa Reut. has attracted a certain amount of usage; it seems not unlikely that it may be taken up again. It would probably be best to rename *Colmeiroa* F. Muell., which has no synonyms.

1964 *Conocephalus* Bl. Bijdr. 483 (1825)

versus

Conocephalum Wiggers, Prim. Fl. Holsat. 82 (1780).

(*Conocephalus* Necker, Elem. Bot. III. 344; 1790).

Conocephalus Bl. (1825). Moraceae.

Accepted by: Endl. Gen. Pl. 281 (1838); Meisn. Gen. Pl. Phanerog. 350 (1842); Brongn. Enum. Gen. Pl. Mus. Paris 99 (1843); Miquel, Pl. Jungh. (1853); Spreng. Linn. Gen. Pl., ed. 9, I. 109 (1830); Spach, Vég. Phan. XI. 38 (1842); Lindl. Vég. Kingd. 271 (1847); Trécul in Ann. Sci. Nat. sér. 3, VIII. 87 (1847); Miq. Fl. Ind. Bat. I. pt. 2, 283 (1859); Bureau in DC. Prod. XVII. 284 (1873); Kurz, For. Fl. Burma II. 429 (1877); Benth. & Hook. Gen. Pl. III. 380 (1880); Engl. & Prantl, Nat. Pflanzenfam. III. pt. 1, 93 (1888); Hook. Fl. Brit. Ind. V. 545 (1888); Dalla Torre & Harms, Gen. Siphonog. 122 (1900); Merrill,

Enum. Philippine Pl. II. 70 (1923); Ridley, Fl. Malay Penins. III. 356 (1924).

Standard species: *C. suaveolens* Bl., the only species originally cited.

Conocephalum Wigg. (1790). Marchantiaceae.

Accepted (usually as *Conocephalus*) by: Dumort. Comm. Bot. 115 (1822); Syll. Jungerm. 7 (1831); Hübener, Hepat. Germ. 9 (1834); Bisch. in Nov. Act. Acad. Leop. XVII. pt. 2, 971, 977 (1835); Endl. Gen. Pl. 44 (1836); Underwood in Bull. Ill. State Lab. II. 38 (1884) and in Gray's Man. ed. 6, 729 (1890); Schiffn. in Engl. & Prantl, Nat. Pflanzenfam. I. pt. 3, 34 (1893); Migula, Kryptogamenfl. Deutschl. 418 (1904?); and most recent authors.

Standard species: *C. conicum* (L.) Dumort. (*C. trioicum* Wigg.)

Conocephalum Wigg. was proposed for conservation by Schiffner in 1930. This is unnecessary, since Wiggers's use of the name is the first subsequent to 1753 and there is no earlier name for the genus. The spelling was changed to *Conocephalus* by Necker, Elem. III. 344 (1790) and he has been generally, though under the rules incorrectly, followed by bryologists.

Conocephalum has at least two synonyms—*Anthoconum* Beauv. (1804) and *Fegatella* Raddi (1818). The former appears never to have been used; the latter, however, was adopted by Nees, Naturgesch. Eur. Lebermoose IV. 179 (1838) who took it up deliberately in place of *Conocephalus* Neck. because of the established *Conocephalus* Bl. He has been followed by various other authors up to Warnstorf, Kryptogamenfl. Mark Brandenburg I. 87 (1903) and Schiffner himself in Rabenh. Kryptogamenfl. Deutschl. VI. pt. 1, 280 (1907).

Conocephalus Bl. was unanimously employed up to 1934, and no synonyms were cited in general works up to Dalla Torre & Harms. In 1894, however, Warburg reduced to synonymy under it *Poikilospermum* Zippel apud Miquel, Ann. Mus. Lugd. Bat. I. 203 (1864). This genus had previously been regarded as insufficiently known and had been left in the position originally assigned to it by Miquel—in *Urticaceae* near *Leucosyke*. It still holds this position in Dalla Torre & Harms.

Warburg's disposition of *Poikilospermum* has been accepted by Bargagli-Petrucchi in Nuov. Giorn. Bot. Ital. n. ser. IX. 214 (1902) who, however, points out certain differences between it and *Conocephalus* proper and sets up a subgenus for it; by Merrill, Interpret. Herb. Amboin. 199 (1917); and by Winkler in Bot. Jahrb. LVII. 600 (1922). None of these authors appears to have examined the collections of Zippel and Teysmann on which the genus was founded; their conclusions are based on more recent material from Amboina (Zippel's type locality) and New Guinea. All of them retain the name *Conocephalus* Bl.

In 1934 Merrill, *Cont. Arnold Arb.* VIII. 47, abandoned *Conocephalus* Bl. because of *Conocephalum* Wigg. and *Conocephalus* Neck. and took up *Poikilospermum* in its place, making all needed combinations. He also pointed out that *Conocephalus* Bl. had been renamed *Conocephalopsis* by Otto Kuntze, *Rev. Gen. Pl.* III. pt. 2, 136 (1898), because of the earlier use of the name though this had been overlooked by the compilers of the *Index Kewensis* and by Dalla Torre & Harms. He further adds *Balansaephytum* Drake del Castillo (1896) to the synonymy.

The least disturbance in nomenclature would have resulted from conserving *Conocephalus* Bl. against its earlier homonym, and *Fegatella* Raddi against its earlier synonym *Anthoconum*. Since, however, the number of species concerned is not very large (about 35), it is probably better to accept Merrill's treatment of the matter. Should *Poikilospermum* be again segregated generically from *Conocephalus* proper, the latter would become *Balansaephytum*, or, if that also were kept apart, *Conocephalopsis*.

Contarinia Zanard. *Classif. Fic.* 45 (1843)
versus

Contarena Adans. *Fam. Pl.* II. 120 (1763).

Contarenia Vand. *Fl. Lusit. & Bras. Spec.* 42, t. 3, fig. 20 (1788).

Contarena Adans. (1763). *Compositae*.

This is a substitute for *Corymbium* L. (or Gron. apud L.), both Linnaeus and Adanson taking the name from Burman, *Cat. Pl. Afric.* 189, t. 70 (1737). It has apparently not been accepted by anyone.

Contarenia Vand. (1788). *Verbenaceae*.

Accepted by: Roem. *Script. Pl. Hispan. Lusit. Bras.* 125 (1796); Jaume St. Hil. *Expos. Fam. Nat.* II. 346 (1805) (as *Contrarenia*); Roem. & Schult. *Syst. Veg.* III. 17, 294 (1818). It is not mentioned by Endlicher. By Benth. & Hook. *Gen. Pl.* II. 1137 (1876); Briq. in Engler & Prantl, *Nat. Pflanzenfam.* IV, pt. 3, 183 (1895); and Dalla Torre & Harms, *Gen. Siphonog.* 434 (1904) listed as genus incertae sedis under *Verbenaceae*. Benth. & Hook. remark of it: "pessime descripta nequaquam recognoscenda et omnino praetermittenda est."

Contarinia Zanard. (1843). *Rhizophyllidaceae*.

Accepted by: J. Agardh, *Sp. Algar.* II. 492; Ardiss. *Phyc. Medit.* I. 230; Hauck, *Meeresalg.* 31; Schmitz & Hauptfleisch in Engler & Prantl, *Nat. Pflanzenfam.* I, pt. 2, 531 (1897).

Standard and only species: *C. peyssonnelaeformis* Zanard.

All the above seem to have been named for the same person, Nicola Contarini of Venice. If they are to be regarded as variant spellings of the same word, *Contarinia* Zanard. should apparently be conserved. Neither the illegitimate *Contarena* Adans. nor the

very dubious *Contarenia* Vand. should, as matters stand, prevent the use of a well-understood and accepted name. It is, however, possible that the discovery of Vandelli's type might fix the application of his name.

8244 **Coptophyllum** Korth. *Ned. Kruidk. Arch.* II. 161 (1851)
versus

Coptophyllum Gardn. *Lond. Journ. Bot.* I. 133 (1842).

Coptophyllum Gardn. (1842). *Schizaeaceae*.

Accepted by Klotzsch in *Linnaea* XVIII. 527 (1844), but by all recent pteridologists treated as a section of *Anemia*.

Coptophyllum Korth. (1851). *Rubiaceae*.

Accepted by: Miquel, *Fl. Ind. Bat.* II. 175 (1856); Benth. & Hook. *Gen. Pl.* II. 68 (1873); Boerlage, *Fl. Ned. Ind.* II. 57, 128 (1891); K. Schumann in Engler & Prantl, *Nat. Pflanzenfam.* IV, pt. 4, 65 (1897); Dalla Torre & Harms, *Gen. Siphonog.* 495 (1905); Koorders, *Excursionsfl. Java* III. 253 (1912).

Standard species: *Coptophyllum bracteatum* Korth., the only species originally cited.

Coptophyllum Korth., a generally accepted genus with 1-3 species and no synonyms, must be renamed or conserved.

7972 **Crabbea** Harv. in *London Journ. Bot.* I. 26 (1842)

versus

Crabbea Harv. *Gen. S. Afr. Pl.* 276 (1838).

Crabbea Harv. (1838). *Acanthaceae*.

Reduced by Endlicher, *Gen.* 1405 (1840) and by Harvey himself to synonymy under *Barleria* L. and apparently not taken up by any subsequent author.

Crabbea Harv. (1842). *Acanthaceae*.

Accepted by: Nees in *DC. Prod.* XI. 162 (1847) and generally by later authors.—Species about 10 from Africa.

Standard species: *C. hirsuta* Harv. from which "the generic character is exclusively taken."

This is a case of using a name a second time, after the first use has proved taxonomically untenable, in an attempt permanently to honor the person after whom the genus is named. Under present rules the second *Crabbea* is a later homonym and illegitimate. Since it has been generally accepted and apparently has no synonyms it should be conserved.

3745 *Cracca* Benth. in Vidensk. Meddel. Nat. For. Kjøbenh. (1853) 8
versus

Cracca L. Sp. Pl. 752 (1753).

Cracca Medic. Vorles. Churpf. Phys. Ges. II. 359 (1787).

Cracca L. (1753). Leguminosae.

Apparently accepted by no subsequent author except Hill, Hort. Kew 296 (1768) until taken up by Otto Ktze. Rev. Gen. Pl. 173 (1891). He was followed by Britton in Mem. Torr. Bot. Club V. 197 (1894) and Ill. Fl. II. 292 (1897), and by all adherents of the American Code.

Cracca Medic. (1787). Leguminosae.

Accepted by: Gren. & Godr. Fl. Fr. I. 468 (1848); Alef. in Bonplandia IX. 116 (1861), in both cases as a substitute for *Vicia* L. By most other authors treated as a synonym of *Vicia* L. or as a section under that genus.

Cracca Benth. (1853). Leguminosae.

Accepted by: Griseb. Fl. Brit. W. Ind. 182 (1859); Benth. & Hook. Gen. Pl. I. 501 (1865); Hemsl. Biol. Cent.-Am. I. 262 (1880); Taubert in Engl. & Prantl, Nat. Pflanzenfam. III, pt. 3. 277 (1894); Dalla Torre & Harms, Gen. Siphonog. 233 (1901); Urban, Symb. Ant. IV. 285 (1905); Boldingh, Fl. Ned. West-Ind. 217 (1913); Lemée, Dict. Gen. Pl. Phan. II. 351 (1930).—Species about 6, American tropics.

Standard species: *C. glandulifera* Benth., the earliest of Bentham's own species.

Cracca L. is a nomen rejiciendum, *Tephrosia* Pers. being conserved against it. The two are essentially identical, Persoon having transferred to *Tephrosia* all the original species of *Cracca*. It would appear, therefore, that the latter cannot be used under the Rules, but still prevents the use of a later homonym.

Cracca Med. was proposed as a segregate from *Vicia* L., based on *V. Gerhardi* Jacq., *V. benghalensis* L. and a new species, *C. syriaca*. It is therefore not a direct synonym and might be taken up on taxonomic grounds, except for *Cracca* L.

Cracca Benth. has been rather generally accepted, though the choice of name was, to say the least, unfortunate. Because of the two earlier uses of *Cracca*, it was, quite properly, renamed *Benthamantha* by Alefeld in Bonplandia X. 264 (1862), who made the necessary combinations for all the species known to him. This renaming has been accepted by Standley in Contr. U. S. Nat. Herb. XXIII. 447 (1922) (Trees and Shrubs of Mexico); Field Mus. Publ. Bot. III. 290 (1930) (Fl. Yucatan), *ibid.* X. 223 (1931) (Fl. Lantecilla Valley); by Britton & Wilson, Sci. Survey Porto Rico V. 394 (1924); and by Rydb. in N. Am. Fl. XXIV. 243 (1924). Except for the rather general use of *Cracca* Benth., Alefeld's renaming should stand; neither *Tephrosia* nor *Cracca* Benth. ought ever to have been proposed.

If *Cracca* Benth. is to be retained, it must be conserved.

6047 *Crantzia* Nutt. Gen. Am. Pl. I. 177 (1818)

versus

Crantzia Scop. Introd. Nat. Hist. 173 (1777).

Crantzia Sw. Prod. Veg. Ind. Occ. 38 (1788).

Cranzia Schreb. L. Gen. Pl. ed. 8. 143 (1789).

Crantzia Scop. (1777). Gesneriaceae.

Apparently accepted by no one until taken up by Fritsch in Engl. Bot. Jahrb. XXIX, Beibl. 65. 7 (1900). *Alloplectus* Mart. (1829) is conserved against it.

Crantzia Sw. (1788). Buxaceae.

Accepted by: J. F. Gmel. Syst. 286 (1791) (*Cranzia*); Vahl, Symb. II. 99 (1791). Swartz, Fl. Ind. Occ. I. 331 (1797) obligingly changed the name of his genus to *Tricera* because of *Cranzia* Schreb., though his own *Crantzia* antedated Schreber's by a year.

Cranzia Schreb. (1789). Rutaceae.

Apparently accepted by no one (all writers having used *Toddalia* Juss. published the same year though according to Kuntze a few months later) until taken up, curiously enough, by Kuntze, Rev. Gen. Pl. I. 99 (1891), in spite of the two earlier homonyms of whose existence he was perfectly aware. No one has followed him.

Crantzia Nutt. (1818). Umbelliferae.

Accepted by: DC. Coll. Mém. V. 27 (1829) and Prod. IV. 70 (1830) and generally until 1891 when the genus was renamed by Greene, Pittonia II. 192 (Sept., 1891) and two months later by Kuntze, Rev. Gen. Pl. I. 267, because of the earlier uses of *Crantzia*.—About 15 species, N. & S. America and Australia.

Standard species: *C. lineata* (Michx.) Nutt. = *Lilaeopsis chinensis* (L.) Ktze.

In addition to the above, there were three other uses of *Crantzia* subsequent to Nuttall's.

Nuttall, when proposing *Crantzia*, was aware that the name had been used before by Vahl, but that genus "having been referred to *Tricera*," he felt he could use the name again. Because of the many and various uses of *Crantzia*, Greene's renaming as *Lilaeopsis* has been accepted by Drude, in Engl. & Prantl, Nat. Pflanzenfam. Nachtr., II. 52 (1900); Coult. & Rose, Mon. N. Am. Umbellif. 123 (1900); Robinson & Fernald in Gray's Man., ed. 7. 617 (1908); A. W. Hill in Journ. Linn. Soc. XLVII. 525 (1927); Lemée, Dict. Gen. Pl. Phan. IV. 91 (1932); and all followers of the American Code. It should stand.

8158 *Cruckshanksia* Hook. & Arn. Bot. Misc. III. 361 (1833)

versus

Cruckshanksia Hook. & Arn. Bot. Misc. II. 211, t. 90 (1831).

Cruckshanksia Hook. & Arn. (1831). Geraniaceae.

Reduced by Hooker & Arnott themselves to synonymy under *Balbisia* Cav. and apparently not taken up by any one.

Cruckshanksia Hook. & Arn. (1833). Rubiaceae.

Accepted by : G. Don, Gen. Syst. III. 631 (1834) ; Endl. Gen. 530 (1838) ; Poepp. & Endl. Nov. Gen. Sp. Chil. Peruv. III. 31 (1845) ; Gay, Fl. Chile. III. 192 (1847) ; Weddell, Chloris Andina II. 41 (1858) ; Benth. & Hook. Gen. Pl. II. 97 (1873) ; F. Phil. Cat. Pl. Vasc. Chile. 112 (1881) ; K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. IV, pt. 4. 30 (1897) ; Dusén, Svensk. Exped. Magellanslând. III. 124 (1900) ; Reiche, Fl. Chile III. 129 (1902) ; Dalla Torre & Harms, Gen. Siphonog. 492 (1905) ; I. M. Johnston in Contr. Gray Herb. LXXXV. 119 (1929) ; Lemée, Dict. Gen. Pl. Phan. II. 385 (1930).—Species about 5. Chile.

Standard species : *C. hymenodon* Hook. & Arn., the only original species.

Cruckshanksia Miers, Trav. II. 529 (1826) is a *nomen nudum*, never validated, and by Miers himself renamed *Solenomelus* in Trans. Linn. Soc. XIX. 95 (1843). It may, therefore, be disregarded. The earlier *Cruckshanksia* Hook. & Arn. was, however, properly published and under present rules prevents the use of the later *Cruckshanksia* (a second use of the name made after the first had been found to be synonymous with *Balbisia*), unless that be conserved.

If *Cruckshanksia* Hook. & Arn. (1833) be not conserved, the genus must take the name *Rotheria* Meyen, Reise I. 402 (1834).

5986 *Cryptodiscus* Schrenk, Enum. Pl. I. 64 (1841)

versus

Cryptodiscus Corda, Icon. Fung. II. 37 (1838).

Cryptodiscus Corda (1838). Stictidaceae.

Accepted by : Rabenh. in Bot. Zeit. (1851) 453 ; Lindl. Veg. Kingd. 43 (1847) ; Rehm in Rabenh. Kryptogamenfl. Deutschl. I, pt. 3, 158 (1888) ; Saccardo, Syll. Fung. VIII. 669 (1889) ; Lindau in Engl. & Prantl, Nat. Pflanzenfam. I. pt. 1, 249 (1896) ; Clements & Shear, Gen. Fung. 310 (1931).

Standard species : *C. Breutelii* Rabenh.

Cryptodiscus Schrenk (1841). Umbelliferae.

Accepted by : Endl. Gen. Suppl. II. 106 (1842) ; Ledeb. Fl. Ross. II. 366 (1847) ; Lindl. Veg. Kingd. 779 (1847) ; Bunge in Acad. Petrop. Mém. sav. étr. VII. 314 (1854) ; Boiss. Fl. Orient. II. 934 (1872) ; Drude in Engl. & Prantl, Nat. Pflanzenfam. III, pt. 8. 173 (1898) ; Dalla Torre & Harms, Gen. Siphonog. 369 (1903).

Standard species : *C. cachroides* Schrenk, the only species originally cited.

This is a difficult case—two genera with identical names, both widely accepted, one in mycological, the other in phanerogamic literature. *Cryptodiscus* Corda is given 26 species by Saccardo ;

but Lindau, l. c., says that a large number of them do not belong in the genus. Clements & Shear, Gen. Fung. 310, reduce here *Propoliopsis* Rehm, Leaf. Philippine Bot. VI. 2279 (1914) ; otherwise, there are no synonyms. *Cryptodiscus* Schrenk has about four species ; no synonyms for it are given.

The simplest course would seem to be to allow priority to prevail and rename *Cryptodiscus* Schrenk.

6384 *Cryptogyne* Hook. apud Benth. & Hook. Gen. Pl. II. 656 (1876)

versus

Cryptogyne Cass. Dict. Sci. Nat. L. 491, 498 (1827).

Cryptogyne Cass. (1827). Compositae.

Accepted by Spach, Vég. Phan. X. 23 (1841), but by DC. Prod. VI. 147 (1837) and generally by later authors, treated as a section of *Erioccephalus* L.

Cryptogyne Hook. f. (1876). Sapotaceae.

Accepted by : Engler in Engl. & Prantl, Nat. Pflanzenfam. IV, pt. 1. 150 (1891) ; Dalla Torre & Harms, Gen. Siphonog. 394 (1903) ; Palacky, Cat. Pl. Madagascar, II. 26 (1907) ; Thonner, Blütenpfl. Afrikas 448 (1908) ; H. J. Lam in Bull. Jard. Bot. Buitenz. Sér. 3, vii. 7, 186 (1925) Dubard in Ann. Mus. Col. Marseille, Sér. 2, X. 86 (1912) reduced it to synonymy under *Calvaria* Comm., a genus before regarded as doubtful and often placed in the synonymy of *Sideroxylon*, but here reconstituted by Dubard.—Species 1 from Madagascar.

Standard and sole species : *C. Gerardiana* Hook. f. l. c.

Cryptogyne Hook. f., if maintained, must be conserved or renamed. It has no synonyms.

5036 *Cumingia* Vidal, Phan. Cuming, Philipp. 211 (1885)

versus

Cummingia D. Don apud Sweet, Brit. Fl. Gard. III. sub t. 257 (1828).

Cummingia D. Don (1828). Amaryllidaceae.

Accepted by : Endl. Gen. 149 (1836) ; Meisn. Pl. Vasc. Gen. 398 (1842) ; Kunth, Enum. IV. 631 (1843) (*Cumingia*) ; Gay, Fl. Chile. VI. 130 (1853) ; Phil. Fl. Atac. 52 (1860) ; Miers in Trans. Linn. Soc. XXIV. 507 (1864) ; Baker in Journ. Linn. Soc. XVII. 493 (1879) (*Cumingia*) ; I. M. Johnston in Contr. Gray Herb. LXXXV. 23 (1929). By Benth. & Hook. Gen. Pl. III. 679 (1883) reduced to synonymy under *Conanthera*, a disposition which has been accepted by Pax in Engl. & Prantl, Nat. Pflanzenfam. II, pt. 5. 122 (1887), Baillon, Hist. Pl. XIII. 79 (1894), and Dalla Torre & Harms, Gen. Siphonog. 77 (1900).—3 or 4 species from Chile.

Cumingia Vidal (1885). Bombacaceae.

Accepted by: K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. III. pt. 6. 67 (1890); Ceron. Cat. Pl. Herb. Manila 28 (1892); Dalla Torre & Harms, Gen. Siphonog. 310 (1901). Treated as a synonym of *Camptostemon* Mart. by Beccari, Malesia III. 273 (1889); Merr. Enum. Philipp. Pl. III. 46 (1923); Lemée Dict. Gen. Pl. Phan. III. 410 (1930).

Cummingia D. Don, which has been accepted by a considerable number of authors, both early and recent, should be retained; *Cumingia* Vidal, if maintained, should be renamed. Although the two genera were named for different individuals, Don's for Lady Gordon Cumming, Vidal's for Hugh Cuming, their names are variant spellings of the same name: and *Cummingia* has by several authors been spelled *Cumingia*, apparently under the impression that it also was named for Hugh Cuming with reference to his Philippine collections.

7668 *Cuspidaria* DC. Bibl. Univ. Genève XVII. 125 (seors. 9) (1838)

versus

Cuspidaria Link, Handb. Gewächse II. 315 (1831).

Cuspidaria Link (1831). Cruciferae.

This is a raising to generic rank of *Erysimum*, sect. *Cuspidaria* DC. in Mém. Mus. Paris VII. 239 (1821). No one seems to have adopted it.

Cuspidaria DC. (1838). Bignoniaceae.

Very generally adopted since its publication.—6 species in Brazil.

Standard species: *C. pterocarpa* (Cham.) DC. In publishing the genus, DeCandolle stated that it was "fondé sur le *Bignonia tetraquetra* de Chamisso." This was apparently an error for *B. pterocarpa* Cham., since that species appears in place of *B. tetraquetra* in Prod. IX. 178 (1845) and in all subsequent treatments of the genus. *B. tetraquetra* belongs to quite a different group.

Cuspidaria DC. has two synonyms, *Nouletia* Endl. Gen. 1407 (1841) and *Lochmocordia* Mart. ex DC. Prod. IX. 177 (1845). The former is a renaming of "*Cuspidaria* DC. . . . non supr." What "supr." means is not wholly clear; presumably it must refer to *Cuspidaria* Link, since that is the only other use of the name recorded by Endlicher. No one has taken up *Nouletia*; it is not even mentioned in the Index Kewensis or by Bentham & Hooker. *Lochmocordia* was cited in synonymy by DeCandolle, l. c.; apparently neither it nor any of the four specific combinations likewise cited by DeCandolle in synonymy has ever been validly published. *Cuspidaria* Link is by recent authors not kept up even as a section.

Under these circumstances it seems preferable to conserve *Cuspidaria* DC., rather than to take up either of its almost unknown synonyms.

8357 *Cuviera* DC. in Ann. Mus. Paris IX. 222, t. 15 (1807)

versus

Cuviera Koeler, Descr. Gram. Gall. et Germ. 328 (1802).

Cuviera Koel. (1802). Gramineae.

Accepted by Körnicke in Flora LXVI. 423 (1833). Apparently by all other authors, following Gray, Nat. Arr. Brit. Pl. II. 92 (1821), treated as a subgenus of *Elymus* or *Hordeum*.

Cuviera DC. (1807). Rubiaceae.

Very generally accepted since its publication, though by Baillon, Adansonia XII. 189ff. (1878) reduced to synonymy under *Canthium*.

Standard and only original species: *C. acutiflora* DC
—About 15 species in tropical Africa.

Since there is little likelihood of *Cuviera* Koel. being taken up, the generally accepted *Cuviera* DC., which has no synonyms, should probably be conserved.

1508 *Cystopus* Blume, Fl. Javae, n. ser. I, 69 (1858)

versus

Cystopus Lév. in Ann. Sci. Nat., sér. 3, VIII. 371 (1847).

Cystopus Lév. (1847). Peronosporaceae.

Accepted by: Saccardo, Syll. Fung. VII. 233 (1888); Fischer in Rabenh. Kryptogamenfl. Deutschl., ed. 2, I, pt. 4. 415 (1892). Treated as a synonym by O. Kuntze, Rev. Gen. Pl. II, 658 (1891); Schröter in Engl. & Prantl, Nat. Pflanzenfam. I, pt. 1. 110 (1892); Migula, Kryptogamenfl. Deutschl. III, pt. 1. 153 (1910); Clements & Shear, Gen. Fung. 241.

Cystopus Bl. (1858). Orchidaceae.

Reduced by Miquel, Fl. Ind. Bat. III. 733 (1859) to a section of *Anectochilus* Bl.; by Benth. & Hook. Gen. Pl. III. 601 (1883), Pfitzer in Engl. & Prantl, Nat. Pflanzenfam. II, pt. 6. 117 (1883) and Dalla Torre & Harms, Gen. Siphonog. 96 (1900) to synonymy under *Odontochilus* Bl. More recently, however, the genus has been revived and accepted by J. J. Smith, Fl. Buitenzorg VI. 97 (1905); Koorders, Excursionsfl. Java I. 359 (1911); Ames, Orchid. V. 34 (1915); Merrill, Enum. Philippine Pl. I. 274 (1922); Schlechter, Orchid., ed. 2. 116 (1927).

Standard species: *C. uniflorus* Bl.

According to Kuntze, Rev. Gen. Pl. II. 658, *Cystopus* Lév. is an exact synonym of *Albugo* (Pers.) S. F. Gray, Nat. Arr. Brit. Pl. I. 540 (1821). Cretzoiu & J. J. Smith in Act. Fauna Fl.

Univers. (Bucharest) I. 4 (1934), maintain, however, that such is not the case—that Persoon described the conidial state and Léveillé the sexual state of the species concerned; that, moreover, *Albugo* cannot be considered because it was published before 1832, the point of departure for the nomenclature of the group in question. They therefore rename *Cystopus* Bl. *Pristiglottis* and make all needed combinations thereunder.

This renaming should stand.

Cyttaria Berk. in Trans. Linn. Soc. XIX. 37 (1841)

versus

Cyttarium Peterm. Fl. Lips. Exc. 608 (1838).

Cyttarium Peterm. (1838). Compositae.

This was proposed as a segregate from *Gnaphalium* L., based on 3 species, *G. dioicum*, *G. arenarium*, and *G. sylvaticum*. Of these, the first two are now referred to *Antennaria* Gaertn. (1791) and *Helichrysum* L. (1753) respectively; the third is retained in *Gnaphalium*. *Cyttarium* Peterm. is, therefore, not only a nomen confusum, but each of its three elements has a prior name. It cannot be used, but since it was published validly, it would prevent any later use of the name.

Cyttaria Berk. (1841). Cyttariaceae.

Accepted by: Sacc. Syll. Fung. VIII. 4 (1889); Clements & Shear, Gen. Fung. 286 (1931), etc.—About 7 species in South America and New Zealand.

If *Cyttaria* and *Cyttarium* are regarded as variant spellings of the same word, the former should be conserved. A name which cannot itself be used should not be allowed to prevent the later valid use of the same name.

LETTERS L—P BY R. MANSFELD

6365 **Labatia** Sw., Prodr. veget. Ind. occ. (1788) 32

versus

Labatia Scop., Intro. (1777) 197.

Labatia Sw., Sapotaceae,

angenommen in: Flora brasil. VII (1863) 61; Bentham-Hook. Gen. II. (1876) 657; Engler-Prantl, Pffam. IV, 1 (1891) 142; Dalla Torre-Harms, Gen. Siphon. no. 6365; Urban, Symbol. VIII (1921) 525.

Leitart: *L. sessiliflora* Sw., die Originalart—etwa 6 Arten im trop. Amerika.

Labatia Scop., Celastraceae,

ist eine Neubenennung von *Macoucoua* Aubl. (1775) und damit

ein Synonym von *Ilex* L. (1753), vergl. Loesener in Abh. Kais. Leop.-Carol. Akad. LXXVIII (1901) 408. Für *Labatia* Sw. steht kein Name weiter zur Verfügung.

1617 **Laelia** Lindl., Gen. and Spec. orch. pl. (1831) 115

versus

Laelia Adans., Fam. II. (1763) 423.

Laelia Lindl., Orchidaceae,

angenommen von allen späteren Autoren mit Ausnahmen von Reichenbach und Reichenbach f., der *Laelia* vorübergehend mit *Bletia* vereinigt hatte. *Laelia* Lindl. ist eine der am meisten kultivierten Orchideengattungen.

Leitart *L. grandiflora* (Llave et Lex.) Lindl.

Laelia Adans., Cruciferae,

ist gegründet auf (*Crambe* Tournef. u.) *Bunias orientalis* L. (1753). Angenommen wurde die Gattung nur von Persoon, Desvaux u. Reichenbach.

Wenn *Laelia* Lindl. nicht geschützt würde, müsste dafür *Amalia* Reichb., Nom. 52 (1841) eintreten; *Laelia* Lindl. wurde wegen *Laelia* Adans. (von Reichenbach als Gattung anerkannt!) umbenannt.

1236 **Lanaria** Ait., Hort. Kew. ed. 1, I (1789) 462

versus

Lanaria Adans., Fam. II (1763) 225.

Lanaria Ait., Amaryllidaceae,

angenommen von: Endl., Gen. (1837) no. 1256; Bentham-Hook., Gen. III (1883) 675; Engler-Prantl, Pffam. II, 5 (1888) 123; Fl. cap. VI (1896) 4; Dalla Torre & Harms, Gen. siphon. no. 1236; Phillips, Gen. S. Afr. Pl. (1926) 165; Engler-Prantl, Pffam. 2. Aufl. 15a (1930) 427.

Leitart: *L. plumosa* Ait., Südafrika.

Lanaria Adans., Caryophyllaceae.

Adanson zitiert u.a. als Synonym *Gypsophila* L.; die Gattung ist stets als Synonym zu *Gypsophila* gestellt worden.

Mit *Lanaria* Ait. fällt *Argolasia* Juss. Gen. (1789) 60, gegründet auf *Hyacinthus plumosus*, zusammen. Dieser Name ist im Dict. Sc. nat. III (1816) 99 angenommen worden, l.c. XXV (1822) 228 wird angegeben, *Argolasia* Juss. habe die Priorität.

3853 **Lens** Miller, Gard. Dict. Abridg. ed. 4 (1754); Druce in Rep. Bot. Exch. Cl. Brit. Isles (1913) III. (433)
versus

Lens Stickmann, Herb. amb. (1754) 18 et Linn. Amoen. acad. IV (1760) 128 et 143, nomen, sine descr., icone Rumphiana citata.

Lens Stickmann, Leguminosae,
ist ein Synonym von *Entada* Adans.; *Lens phaseoloides* Stickmann=*Entada scandens* Bth.=*Entada phaseoloides* Merr. (1914). *Entada* Adans. (1763) ist gegen *Gigalobium* Boehm. geschützt (Int. Rules 3rd ed. [1935] 98), also auch gegen *Lens* Stickmann (1754).

Lens Miller=*Lens* Moench, Method. (1794) 131, Leitart *L. esculenta* Moench, wird vielfach als Gattung betrachtet oder als Subgenus von *Vicia* oder *Ervum* aufgefasst. Es empfiehlt sich, um Schwierigkeiten zu vermeiden, *Lens* Miller gegen *Lens* Stickmann zu schützen.

3022 **Lepidostemon** Hook. f. et Thoms. in Journ. Linn. Soc. V (1861) 131
versus

Lepidostemon Hassk., Cat. pl. Hort. bogor. (1844) 140.

Lepidostemon Hook. f. et Th., Cruciferae,
angenommen von: Bentham-Hook., Gen. I. (1862) 77; Engler-Prantl, Pflfam. III, 2 (1890) 198; Hook. f., Fl. Brit. Ind. I (1872) 147; Dalla Torre & Harms, Gen. siph. no. 3022.
Einzigste Art: *L. pedunculatus* H. f. et Th., Himalaya.

Lepidostemon Hassk., Convolvulaceae,
ist eine unberechtigte sprachliche Veränderung von *Lepistemon* Blume (1875). *Lepistemon* Blume und *Lepidostemon* Hook. f. et Th. sind bisher nebeneinander als gültig angenommen worden. Ein weiterer Name für *Lepidostemon* Hook. f. et Th. steht nicht zur Verfügung.

8130 **Lerchea** L., Mant. II (1771) 155
versus

Lerchia Zinn, Catal. Pl. Goett. (1757) 30.

Lerchea L., Rubiaceae,
ist allgemein angenommen worden: Endl., Gen. (1840) no. 3251/1; Bentham-Hook., Gen. II (1883) 53; Engler-Prantl, Pflfam. IV, 4 (1897) 23; Dalla Torre & Harms, Gen. siph. no. 8130.

Leitart: *L. longicauda* L.—2 Arten, Malesien.

Lerchia Zinn, Chenopodiaceae,
ist gegründet auf *Chenopodium fruticosum* u. *Ch. altissimum* und damit Synonym von *Suaeda* Forsk. (1775) nomen conserv. (Int.

Rules 3rd ed. [1935] 95); cfr. Sprague in Kew Bull. (1934) 219.
—*Lerchea* Rueling, Ord. pl. (1774) 45 ist ebenfalls gegenüber *Suaeda* Forsk. verworfen.

5990 **Lichtensteinia** Cham. et Schlechtend. in Linnaea I (1826) 394

versus

Lichtensteinia Willd. in Mag. Ges. nat. Fr. Berlin II (1808) 19 et *Lichtensteinia* Wendl., Coll. pl. II (1808) 4.

Lichtensteinia Cham. et Schlechtend., Umbelliferae,
angenommen von Bentham-Hook., Gen. I (1867) 887; Fl. capens. II (1862) 542; Engler-Prantl, Pflfam. III, 8 (1898) 178; Dalla Torre & Harms, Gen. siphon. no. 5990; Phillips, Gen. S. Afr. Fl. Pl. (1926) 450; Burt-Davy, Flow. Pl. Transvaal II (1932) 517.

Leitart: *L. lacera* Cham. et Schlechtend.—5 Arten in Südafrika.
Lichtensteinia Willd., Liliaceae,
ist gegründet auf *L. laevigata* u. *L. undulata* Willd.; diese Arten fallen zusammen mit *Ornithoglossum glaucum* Salisb., der Leitart von *Ornithoglossum* Salisb. (1806).

Lichtensteinia Wendl., Lorantheae,
gegründet auf *L. oleifolia* Wendl.; diese Art wurde schon 1818 von F. G. Dietrich zu *Loranthus* (als *L. speciosus*) gestellt=*Loranthus oleaefolius* (Wendl.) Cham. et Schlechtendal 1828; vergl. Sprague in Kew Bull. (1914) 362. Der Name *Loranthus* sect. *Lichtensteinia* ist von Van Tieghem irrig angewendet worden für die Section *Moquinia* (Spreng.) Sprague. Sprague hat deshalb *Lichtensteinia* als Sectionsnamen fallen lassen und *Tapinanthus* Blume dafür angewendet.

9412 **Ligularia** Cass. in Bull. Soc. philom. (1816) 198
versus

Ligularia Duval, Pl. Succul. Hort. Alençon (1809) II.

Ligularia Cass., Compositae,
angenommen von DC., Prodr. VI (1837) 313, VII (1838) 300; Endl., Gen. (1838) no. 2799; Hoffmann in Engler-Prantl, Pflfam. IV, 5 (1894) 301; Dalla Torre & Harms, Gen. siphon. no. 9412; Hegi, Ill. Fl. Mitteleuropa IV, 2 (1929) 796; Matsu-mura, Ind. pl. Japon. II, 2 (1912) 656.

(Bei Bentham-Hook., Gen. II [1873] 449 u.a. sub *Senecio* L.)
Leitart: *L. sibirica* Cass. in Dict. Sc. nat. XXVI (1823) 402.
—Veber 30 Arten, Europa bis Asien. Die Gattung ist auch in der gärtnerischen Literatur oft angenommen.

Ligularia Duval, Saxifragaceae,
ist gegründet auf *Saxifraga sarmentosa* L. und ist daher Synonym der auf dieselbe Art gegründeten Gattung *Diptera* Borkhausen (1794)=*Saxifraga* sect. *Diptera* Engler.

Falls *Ligularia* Cass. nicht geschützt wird, könnte dafür bei entsprechender Gattungsumgrenzung *Senecillis* Gaertn. eintreten (gegründet auf *Senecillis glauca* Gaertn. = *Ligularia glauca* [L.] O. Hoffm.).

4542 *Limnanthes* R. Br. in Proc. Linn. Soc. (1833) et in Edinb. Philos. Mag. II (1833) 70
versus

Limnanthes Stokes, Bot. Mat. med. I (1812) 300, et
Limnanthus Neck., Elem. II (1790) 27.

Limnanthes R. Br., Limnanthaceae,
ist allgemein angenommen worden: Torr. et Gray, Fl. N. Amer. I. (1838) 209; Endl., Gen. no. 6066 (1840); Bentham-Hook., Gen. I (1862) 274; Engler-Prantl, Pflfam. III, 5 (1896) 137; Dalla Torre & Harms, Gen. siphon. no. 4542; Rydberg, N. Amer. Fl. XXV. 2 (1910) 97.

Leitart: *L. Douglasii* R. Br.—9 Arten, N. Amerika.

Limnanthes Stokes und

Limnanthus Neck. Gentianaceae, sind nur veränderte Schreibweisen von *Limnanthemum* Gmel. (1769) = *Nymphoides* Hill (1756). Für *Limnanthes* R. Br. steht ein weiterer Name nicht zur Verfügung (Reichenbach hat *Limnanthus* geschrieben [Handb. 1837, 290]). Nach *Limnanthes* R. Br. ist die Familie Limnanthaceae benannt.

1483 *Limodorum* L. C. Rich. in Mém. Mus. Paris IV (1818) 50
versus

Limodorum L., Spec. pl. (1753) 950.

Limodorum im Sinne von L. C. Richard (Leitart: *L. abortivum* Sw. in Nov. Acta Soc. Sc. Upsala VI [1799] 80, L. C. Rich., l.c. 58). ist allgemein angenommen worden und sollte geschützt werden, da es sich um eine (auch in nicht systematischen Werken) viel erwähnte Pflanze handelt. Spätere Namen sind *Centrosis* Sw., Adnot. Bot. (1829) 52 und *Jonorchis* Beck, Fl. Niederösterreich. (1890) 215; ferner *Lequeetia* Bubani, Fl. Pyr. II (1901) 57. *Centrosis* Sw. ist ein späteres Homonym von *Centrosis* Thou., es müsste also *Jonorchis* Beck als gültiger Name eintreten.

Limodorum L. (1753), Leitart: *L. tuberosum* L., ist früher mit *Calopogon* R. Br. identifiziert worden, ist aber = *Bletia* R. et Pav.; cfr. Ames, Enum. Orch. U. S. & Can. (1924) 71. *Limodorum* L. ist nur von Ames vorübergehend aufgenommen worden.

Wird *Limodorum* L. C. Rich. geschützt, so wird damit *Bletia* gegen *Limodorum* L. beibehalten.

3328 *Lindleya* H.B.K., Nov. gen. et spec. VI (1823) 239

versus

Lindleya Nees in Flora IV (1821) 299 et

Lindleya H.B.K., Nov. gen. et spec. V (1821) t. 479 et 480; Kunth, Malvac. (1822) 10.

Lindleya Nees, Theaceae,

ist gegenüber *Laplacea* H.B.K. (1822) als nomen rejiciendum vorgeschlagen (Int. Rules 3rd ed. [1935] 135) und von der Mehrheit des Ausschusses angenommen worden.

Lindleya H.B.K. (1821), Flacourtiaceae,

tritt in H.B.K., Nov. gen. et spec. V (1821) auf t. 479 und 480 auf (*Lindleya glabra* [479] u. *Lindleya mollis* [480]). Im Exemplar der Bibliothek des Botan. Museums Dahlem sind beide Tafeln doppelt, die Doppel tragen die Namen *Casearia javitensis* (479) und *Casearia hirsuta* (480). Im Text sind nur die Casearien genannt. Bei Kunth (1822) tritt der Name *Lindleya* nur als nomen nudum auf.

Lindleya H.B.K. (1823), Rosaceae,

einzige Art *L. mespiloides* H.B.K., Mexico, angenommen von allen Autoren, z.B.: Endl., Gen. (1840) no. 6399; Bentham-Hook., Gen. I (1865) 615; Engler-Prantl, Pflfam. III, 3 (1888) 18; Hemsley, Biol. Centr. Amer. Bot. (1880) 370; Dalla Torre & Harms, Gen. siphon. no. 3328; bis Rydberg in N. Amer. Fl. XXII (1908) 259 dafür den Namen *Lindleyella* einführt, den Standley, Trees and Shrubs of Mexico (1922) 322 angenommen hat.

1077 *Lloydia* Salisb. in Transact. Hort. Soc. I (1812) 328

versus

Lioidya Necker, Elem. I (1790) 4.

= *Lloydia* corr. Endl., Gen. no. 2931, in Indice tantum p. 1459 (1840).

Lioidya Necker, Compositae ist eine Variante von *Lloydia* und von Endlicher korrigiert worden. *Lioidya* Necker = *Lloydia* Endl. ist nomen rejiciend. gegenüber dem nomen conserv. *Printzia* Cass. in Dict. sc. nat. XXXVII (1825) 463 (Int. Rules 3rd ed. [1935] 110).

Lloydia Salisb. ist gegründet auf *L. alpina* Salisb. l.c. = *L. serotina* (L.) Sweet. Die Gattung ist allgemein angenommen worden (etwa 12 Arten).

4247 *Lophanthera* A. Juss. in Ann. Sc. nat. 2. ser. XIII (1840) 328

versus

Lophanthera Raf., New Fl. Amer. II (1836) 58.

Lophanthera A. Juss., Malpighiaceae,

angenommen von Griseb. in Fl. brasil. XII, 1 (1858) 25; Ben-

427

tham-Hook., Gen. I (1862) 255; Engler-Prantl, Pflfam. III, 4 (1890) 70; Dalla Torre & Harms, Gen. siphon. no. 4247; Niedenzu in Engl., Pflreich IV 141 (1928) 605.

Leitart: *L. Kunthiana* Juss. = *L. longifolia* (Kth.) Griseb.—3 Arten in Brasilien.

Lophanthera Raf., Scrophulariaceae,

gegründet auf *L. delphinifolia* Raf. = *Gerardia delphinifolia* L. = *Sopubia delphinifolia* Don, Gen. syst. IV, 560 (1838), von Don zu *Sopubia* Buch.-Ham. ex Don, Fl. nepal. (1825) 88 gestellt (Leitart: *S. trifida* Ham. ex Don l.c.) und seitdem dort belassen.

682 **Ludovia** Brongn. in Ann. Sc. nat. 4. ser. XV (1861) 361

versus

Ludovia Pers., Syn. II (1807) 576.

Ludovia Pers. ist ein von Persoon für *Carludovica* Ruiz et Pav. (1794, neu gebildeter Name, den niemand aufgenommen hat.

Ludovia Brongn., Cyclanthaceae, Leitart: *L. lancifolia* Brongn., angenommen von Drude in Fl. brasil. III, II, (1881) 243; Bentham-Hooker f., Gen. pl. III. (1883) 953; Engler-Prantl, Pflfam. II, 3 (1889) 101; Dalla Torre & Harms, Gen. siphon. no. 682. Brongn. hat bei der Aufstellung seiner Gattung den Namen *Ludovia* absichtlich gewählt, weil *Ludovia* Pers. von niemand gebraucht worden ist. *Ludovia* Brongn. müsste einen neuen Namen erhalten, falls die Gattung nicht geschützt wird.

4959 **Luehea** Willd. in Neue Schr. Ges. nat. Freunde Berlin III (1801) 410, t. 5 (*Luhea*)

versus

Luehea F. W. Schmidt, Neue u. selt. Pfl. (1793) 23 et in Usteri, Ann. 6. Stück (1793) 118.

Luehea Willd., Tiliaceae,

angenommen von St. Hil., Fl. brasil. mer. I (1825) 225; Endl. Gen. (1840) no. 5365; Bentham-Hook., Gen. I (1862) 235 (*Luhea*); Hemsley, Biol. Centr. Amer. Bot. I (1879/81) 140; K. Schum. in Fl. brasil. XII, 3 (1886) 151; Engler-Prantl, Pflfam. III, 6 (1890) 22; Dalla Torre & Harms, Gen. siphon. no. 4959; Burret, Beitr. Kenntn. Til. in Notizbl. Bot. Gart. Berl.-Dahlem IX (1926) 822.

Leitart: *L. speciosa* Willd.—20 Arten, Centralamerika u. Westindien bis Brasilien.

Luehea F. W. Schmidt, Verbenaceae,

Leitart: *L. ericoides* Schm. ist ein Synonym von *Stilbe* Berg (1767), *L. ericoides* Schm. = *Stilbe ericoides* L., und wird wahr-

scheinlich bei *Stilbe* verbleiben. Falls *Luehea* Willd. nicht geschützt wird, muss dafür *Alegria* Moc. et Sessé in DC., Prodr. I (1824) 516, gegründet auf *A. candida* Moc. et Sessé l.c. = *Luehea candida* Mart., angenommen werden.

5334 **Lunania** Hook. in London Journ. of Bot. III (1844) 317

versus

Lunania Raf., Medic. Flora II (1830) 106.

Lunania Hook., Flacourtiaceae,

angenommen von Bentham-Hook., Gen. I (1865) 797; Griseb., Fl. Brit. W. Ind. (1859) 20; Engler-Prantl, Pflfam. III, 6a (1894) 46; Urban, Symb. VI (1909) 18; Fawc. et Rendle, Fl. Jamaica V (1926) 221; Dalla Torre-Harms, Gen. Siphon. no. 5334.

Leitart: *L. racemosa* Hook. l.c.—7 Arten in Westindien und Brasilien.

Lunania Raf., Pontederiaceae,

gegründet auf *L. uniflora* Raf. = *Pontederia limosa* "L." ex Raf. = *P. limosa* Sw., gehört nach allgemeiner Auffassung zu *Heteranthera* Ruiz et Pav. (1794) und es ist unwahrscheinlich, dass die Gattung wiederhergestellt werden wird. Ein weiterer Name für *Lunania* Hook. steht nicht zur Verfügung.

7697 **Lundia** DC. in Bibl. univ. Genève XVII (1838) 127 et in Ann. Sc. nat. 2. ser. Bot. XI (1839) 289

versus

Lundia Schum. et Thonn., Beskr. Guineiske Pl. II (1828) 5.

Lundia DC., Bignoniaceae,

angenommen von DC., Prodr. IX (1845) 180; Endl., Gen. (1840) no. 4122/1; Bentham-Hook., Gen. II (1876) 1032; Baillon, Hist. pl. X (1891) 32; Engler-Prantl, Pflfam. IV, 3b (1895) 224; Fl. brasil. III, 2 (1897) 234; E. Bureau, Monogr. Bignon. (1864) 35, 44; Dalla Torre & Harms, Gen. siph. no. 7697.

Leitart: *L. glabra* DC. in Ann. Sc. Nat. l.c. 290.—15 Arten, Südamerika.

(*Lundia* Puer. ex DC., Prodr. II [1825] 64, Anacardiaceae, ist ein nomen nudum, als Synonym zitiert zu *Buchanania*).

Lundia Schum. et Thonn., Flacourtiaceae,

mit der einzigen Art *L. monacantha* Schum. et Thonn. l.c. ist identisch mit *Oncoba spinosa*, der Leitart von *Oncoba* Forsk. (1775); zuerst damit vereinigt von A. Rich. in Guillemain, Fl. Senegamb. (1830/33) 32.

8039 **Mackaya** Harv., Thes. cap. I (1859) 8, t. 13
versus
Mackaya Arn. in Mag. Zool. and Bot. II (1838) 550.

Mackaya Harv., Acanthaceae,
angenommen von: Engler-Prantl, Pflfam. IV 3b (1895) 336;
Dalla Torre & Harms, Gen. siph. no. 8039; Phillips, Gen. S. Afr.
Fl. Pl. (1926) 575.
Einzige Art: *M. bella* Harv., Südafrika.

Mackaya Arn., Erythralaceae,
gegründet auf *M. populifolia* Arn.; die Art ist von Planchon
(Ann. Sc. nat. 4. sér. II [1854] 260) zu *Erythralum* Blume
(1826) gestellt worden und seitdem dort belassen.
Ein weiterer Name für *Mackaya* Harv. steht nicht zur Verfügung.

2973 **Mancoa** Wedd., Chloris and. I (1857) t. 86
versus
Mancoa Raf., Fl. Tellur. III (1836) 56.

Mancoa Wedd., Cruciferae,
angenommen von: Benth-Hook., Gen. I (1862) 86; Engler-
Prantl, Pflfam. III, 2 (1891) 186; Gilg et Muschler, Sudan.
Crucif. 463; Dalla Torre-Harms, Gen. siph. no. 2973; Haum.
et Irig., Cat. Phanérog. Argent. II (1923) 275.

Leitart: *M. hispida* Wedd.—1 Art in Peru und im andinen
Argentinien.

Mancoa Raf., Phytolaccaceae,
gegründet auf *M. secunda* Raf.=*Mohlana secunda* Mart. (ex
Ind. Kew.) ist stets zu *Mohlana* Mart. (1829)=*Hillieria* Vell.
(1825 et 1827) gestellt worden, cfr. Heimerl in Engler-Prantl,
Pflfam. 2. Aufl. 16c (1934) 151. Es ist unwahrscheinlich, dass
die Gattung *Mancoa* Raf. wiederhergestellt werden wird.

128 **Manisuris** Sw., Prodr. veget. Ind. occ. (1788) 25, part.; Fl.
Ind. occ. I (1797) 186
versus
Manisuris L., Mant. II (1771) 164.

Manisuris L., Gramineae,
ist gegenüber *Rottboellia* L.f. (1779) verworfen. (Int. Rules 3rd
ed. [1935] 89).

Manisuris Sw., Gramineae,
mit der einzigen Art *M. granularis* Sw., pantropisch, ist lange
allgemein angenommen worden: Benth.-Hook., Gen. III (1873)
1130; Engler-Prantl, Pflfam. II, 2 (1887) 25; Dalla Torre &
Harms, Gen. siph. no. 128. O. Kuntze stellte 1891 *Manisuris*
L. wieder her und gab für *Manisuris* Sw. den neuen Namen

Hackelochloa (Rev. Gen. II, 776). Skeels nahm den Namen
Ryttilix Raf. in Séringe, Bull. bot. I (1830) 219 auf (U.S. Dept.
Agr. Bur. Pl. Ind. Bull. 282 [1913] 20). *Ryttilix* ist gegründet
auf *Manisuris granularis* und *Myurus* Auct.; Hitchcock hat
die erste Art als Leitart gewählt (U.S. Dept. Agr. Bull. 772
[1920] 280), später den Namen aber wieder verworfen und
Hackelochloa angenommen (Contr. U.S. Nat. Herb. 24 [1927]
506, 24 [1930] 698).

4693 **Mappia** Jacq., Hort. Schoenbrunn. I (1797) t. 22, 47
versus
Mappia Heist. ex Adans. Fam. II. (1763) 193 et
Mappia Schreb., Gen. II (1791) 806.

Mappia Jacq., Icacinaceae,
angenommen von: Miers in Ann. and Magaz. Nat. Hist. 2nd
ser. IX (1852) 394; Benth-Hook., Gen. I (1862) 351; Engler-
Prantl, Pflfam. III, 5 (1893) 249; Urban, Symb. IV (1910) 367;
Fawc. et Rendle, Fl. Jamaica V (1926) 39; Dalla Torre & Harms,
Gen. siph. no. 4693; Koorders, Excursionsflora Java II (1912)
532.

Leitart: *M. racemosa* Jacq., Jamaica.—7 Arten in trop. Asien
und Amerika.

Mappia Heist. ex Adans., Labiatae,
gegründet auf *Cunila* L. und *Calamintha* Pluk. 344 t. 2 fällt mit
Cunila L. (1759 et 1762) zusammen.

Mappia Schreb., Gen. II (1791) 806, Dilleniaceae,
ist nur eine unberechtigte Neubenennung von *Soramia* Aubl.
(1775); diese Gattung wird seit langem mit *Doliocarpus* Roland.
(1756) vereint. Schreber hat l.c. vol. I, 348 *Soramia* Aubl. selbst
mit ? zu *Doliocarpus* gestellt.

Ein weiterer Name für *Mappia* Jacq. steht nicht zur Verfügung;
die Gattung müsste neu benannt werden, falls sie nicht geschützt
wird.

Mariscus Gaertn., Fruct. I (1788) 11; Vahl, Enum. II (1806) 372
versus
Mariscus Zinn, Cat. Pl. Hort. Goett. (1757) 79.

Mariscus Zinn, Cyperaceae,
=*Mariscus* Hall. (1742) fällt zusammen mit *Cladium* P. Br.,
Hist. Jamaica (1756) 114, Schrader, Fl. germ. I (1806) 74;
die gemeinsame Leitart ist *Schoenus Mariscus* L. (1753)=
Cladium Mariscus (L.) R. Br.=*Cladium jamaicense* Crantz. Cfr.
Sprague in Kew Bull. (1934) 218, 219.

Mariscus Gaertn., Cyperaceae,
Leitart: *M. capillaris* Vahl l.c., wird als *Cyperus* L. sect. *Maris-*
cus Endl., Gen. (1836) 119 geführt oder auch als eigene Gattung

angenommen, z. B. von Clarke in Kew Bull., Add. ser. VIII (1908) 101; Urban, Symb. IV (1903) 113; Hooker f., Fl. Br. Ind. VI (1893) 586; Ridley, Fl. Mal. Penins. V (1925) 148; Domin in Bibl. Bot. Heft 85 (1915) 414.

Da *Mariscus* Zinn völlig mit *Cladium* P. Br. zusammenfällt, kann der Name von Zinn ohne Bedenken verworfen werden.

9247 **Marshallia** Schreb., Gen. II (1791) 810
versus

Marshallia J. F. Gmel., Syst. II (1791) 836.

Marshallia Schreb., Compositae,
angenommen von: Pursh, Fl. Amer. Sept. II (1814) 519; DC. Prodr. V (1836) 680; Endl., Gen. (1838) no. 2624; Bentham-Hook., Gen. II (1873) 392; Engler-Prantl, Pflfam. IV, 5 (1894) 247; Dalla Torre & Harms, Gen. siph. no. 9247; Robins. et Fernald, Gray's New Manual 7th ed. (1908) 842; Chapman, Fl. S.U. St. (1872) 241; Rydb., Fl. Prairies and Plains C.N. Amer. (1932) 839; Small, Manual S.E. Fl. (1933) 1455.

Leitart: *M. lanceolata* Pursh.—Etwa 4 Arten, Virginien bis Texas u. Florida.

Marshallia J. F. Gmel., Flacourtiaceae,
ist ein neuer Name für *Lagunezia* Scop., Introd. (1777) 216; dies ist wieder nur eine Neubenennung von *Racoubea* Aubl. (1775); heute als *Homalium* Jacq. (1760) Sect. *Racoubea* Endl. (1839) geführt.

Wenn *Marshallia* Schreb. nicht geschützt wird, so muss dafür *Phyteumopsis* Juss. ex Poir., Encycl. Suppl. IV (1816) 405 eintreten, die übrigen Synonyme sind nicht verwendbar (*Persoonia* L. C. Rich. [1803] non Sm. [1798]; *Trattenikia* Pers. [1807] non *Trattinikia* Willd. [1806]).

3042 **Matthiola** R. Br. (*Mathiola*) in Ait., Hort. Kew. ed. 2, IV (1812) 119
versus

Matthiola L., Spec. pl. ed. 1 (1753) 1192.

Matthiola R. Br., Cruciferae,
ist ganz allgemein angenommen worden: Endl., Gen. (1839) no. 4845; Bentham-Hook., Gen. I (1862) 67; Engler-Prantl, Pflfam. III, 2 (1891) 202; Conti in Bull. Herb. Boiss. V (1897) 31, 315; Dalla Torre & Harms, Gen. siph. no. 3042.

Leitart: *M. incana* R. Br.; etwa 50 Arten, Westeuropa, Mittelmeergebiet, Orient.

Matthiola L., Rubiaceae,
gegründet auf *M. scabra* L., ist schon seit 150 Jahren zu *Guettarda* L. als Synonym gestellt worden.

Matthiola R. Br. ist wegen der grossen gärtnerischen Bedeutung und der grossen Artenzahl zu schützen, wie schon Sprague vorgeschlagen hat (Kew Bull. [1928] 357).

660 **Maximiliana** Mart., Hist. nat. Palm. II (1823–50; 1824?) 131

versus

Maximiliana Mart. apud Schrank in Flora II (1819) 451.

Maximiliana Mart. (1824?), Palmae,
angenommen von: Endl., Gen. (1837) no. 1775; Bentham-Hook., Gen. III (1883) 946; Drude in Fl. brasil. III, 2 (1882) 450, part.; Engler-Prantl, Pflfam. II, 3 (1889) 81; Burret in Notizbl. Bot. Gart. Berl.-Dahlem X (1929) 689; Dalla Torre-Harms, Gen. Siph. no. 660.

Leitart: *M. regia* Mart. l.c. 132.

Maximiliana Mart. (1819), Cochlospermaceae,
ist gegenüber *Cochlospermum* Kunth (1822) verworfen (Int. Rules [1935] 103).

Maximiliana Mart. ist eine sehr bekannte Palmengattung, die unbedingt zu schützen ist. Der von O. Kuntze (Rev. gen. II [1891] 728) wegen des älteren Homonyms gegebene Name *Englerophoenix* ist nur von Barbosa Rodrigues in Sert. Palm. I (1903) 75 gebraucht worden.

5692 **Meriania** Sw., Fl. Ind. occ. II (1800) 823, t. 15
versus

Meriana Trew, Pl. select. pinx. Ehret (1754) 11, t. 40.

Meriana Trew, Iridaceae,
ist gegenüber *Watsonia* Mill., Gard. Dict. 7th ed. (1759) verworfen (Int. Rules 3rd ed. [1935] 93).

Meriana Sw., Melastomataceae,
ist allgemein angenommen worden: Endl., Gen. (1840) no. 6169; Bentham-Hook., Gen. I (1865) 749; Flora Brasil. XIV, iv (1886) 24; Cogn. in DC. Mon. Phan. VII (1891) 421; Engler-Prantl, Pflfam. III, 7 (1898) 167; Dalla Torre & Harms, Gen. siph. no. 5692.

Leitart: *M. leucantha* Sw.—Etwa 30 Arten im trop. Amerika

8353 **Mesoptera** Hook. f., in Bentham-Hook., Gen. II (1873) 130
versus

Mesoptera Raf., Fl. Tellur. IV (1836) 49.

Mesoptera Hook. f., Rubiaceae,
angenommen von: Hook. f., Fl. Br. Ind. III (1880) 136; Engler-

Prantl, Pflfam. IV, 4 (1897) 92; Dalla Torre & Harms, Gen. siph. no. 8353; Ridley, Fl. Malay Penins. II (1923) 127.

Leitart: (einzige Art) *M. Maingayi* Hook. f.—Malakka.

Mesoptera Raf., Orchidaceae,

ist nach dem Ind. Kew. ein Synonym von *Liparis* L. C. Rich. (1818).

4436 *Micrandra* Benth. in Hook. Kew Journ. VI (1854) 371

versus

Micrandra R. Br. in Bennett, Pl. Jav. rar. (1844) 237.

Micrandra Benth., Euphorbiaceae,

angenommen von: Müll. Arg. in DC. Prodr. XV, 2 (1866) 709; Benth. Hook., Gen. III (1880) 289; Fl. Brasil. XI, 2 (1873) 289; Engler-Prantl, Pflfam. III, 5 (1896) 76; 2. Aufl. 19c (1931) 180; Dalla Torre & Harms, Gen. siph. no. 4436.

Leitart: *M. siphonoides* Bth.—4–5 Arten in Brasilien.

Micrandra R. Br., Euphorbiaceae,

ist gegründet auf *M. ternata* R. Br. = *Hevea discolor* (Bth.) Muell. Arg. (Müll. Arg. in DC. Prodr. XV, 2 [1866] 717; Pax u. Hoffm. in Engler, Pflanzenreich IV, 147 [1910] 125). Es ist nicht anzunehmen, dass diese Art als Gattung von *Hevea* Aubl. (1775) abgetrennt werden könnte.

Falls *Micrandra* Bth. nicht geschützt wird, muss dafür *Pogonophyllum* Diedrichs. (1857) eintreten.

1313 *Micranthus* Eckl., Verz. Pflanzensamml. (1827) 43

versus

Micranthus Wendl., Bot. Beob. (1798) 38, 39.

Micranthus Eckl., Iridaceae,

angenommen von: Benth. Hook., Gen. III (1883) 706; Engler-Prantl, Pflfam. II, 5 (1888) 157; 2. Aufl. 15a (1930) 489; Fl. cap. VI (1896) 97; Dalla Torre & Harms, Gen. siph. no. 1313; Phillips, Gen. S. Afr. Fl. Pl. (1926) 176.

Leitart: *Gladiolus alopecuroides* L.—Südafrika.

Benth. Hook. l.c. zitieren als Autor Pers., Syn. pl. I (1805) 46, dort ist *Micranthus* aber nicht als Gattung aufgestellt.

Micranthus Wendl., Acanthaceae,

ist Synonym der geschützten Gattung *Phaulopsis* Willd. (1800) und verworfen (Int. Rules 3rd ed. [1935] 108).

Wird *Micranthus* Eckl. nicht geschützt, so tritt dafür *Beilia* Eckl. l.c. 43 ein.

5648 *Microlepis* Miq., Comm. phytogr. II (1839) 71

versus

Microlepis Eichwald, Casp.-cauc. (1831) 2.

Microlepis Miq., Melastomataceae,

angenommen von: Endl., Gen. (1840) no. 6224; Benth. Hook., Gen. I (1865) 741; Engler-Prantl, Pflfam. III, 7 (1893) 152; Cogn. in DC., Mon. Phan. VII (1891) 149 et in Fl. Brasil. XIV, III (1885) 235; Dalla Torre & Harms, Gen. siph. no. 5648. Miquel gründete die Gattung auf *Osbeckia* sect. *Microlepis* DC., Prodr. III (1828) 139.

Leitart: *Osbeckia oleifolia* DC.—4 Arten in Brasilien.

Microlepis Eichwald, Chenopodiaceae,

gegründet auf *M. salsa* = *Brachylepis salsa* C. A. Mey., die Leitart von *Brachylepis* C. A. Mey. (1829) oder *Anabasis* sect. *Brachylepis* H.f.

Für *Microlepis* Miq. steht der Name *Ancistrodesmus* Naud. in Ann. sc. nat. 3. sér. XIII (1849) 302 zur Verfügung.

(*Brachylepis* Wight et Arn. Contrib. Bot. Ind. (1834) 63, Asclepiadaceae, muss neubenannt werden.)

1112 *Milligania* Hook. f. in Hook., Kew Journ. V (1853) 296, t. 9

versus

Milligania Hook. f. in Hook., Icon. pl. (1840) t. 299.

Milligania Hook. f. (1840), Halorrhagidaceae, mit der einzigen Art *M. cordifolia* Hook. f., ist von Hook. f., Fl. Tasman. I (1853–59) 125 zu *Gunnera* L. (1767) eingezogen worden; ebenso bei Schindler, Pflr. IV, 225 (1905) 107. Der dadurch frei gewordene Name ist von Hooker f. sofort wieder verwendet worden.

Milligania Hook. f. (1853), Liliaceae, Leitart: *M. longifolia* H.f. angenommen von: Hook. f., Fl. Tasman. II (1853–59) 61; Benth. Fl. austr. VII (1878) 25; Benth. Hook. f., Gen. pl. III (1883) 781; Engler-Prantl, Pflfam. II, 5 (1888) 76; Dalla Torre & Harms, Gen. siph. no. 1112; Engler-Prantl, Pflfam. 2. Aufl. 15a (1930) 361.

Falls *Milligania* H.f. (1853) nicht geschützt wird, müsste die Gattung einen neuen Namen erhalten.

7853 *Mitraria* Cav. in Ann. cienc. nat. III (1801) 230, t. 31

versus

Mitraria J. F. Gmel., Syst. II (1791) 799.

Mitraria Cav., Gesneriaceae,

Leitart: *M. coccinea* Cav., angenommen von: Endl., Gen. no. 4156 (1839); Gay, Fl. Chil. IV (1849) 347; DC., Prodr. VII (1839) 537; Hanstein in Linnaea XXXIV (1865) 253 et 418; Benth. Hook., Gen. pl. II (1876) 1012; Philippi, Catal. pl.

vasc. chilens. (1881) 192; Engler-Prantl, Pffam. IV, 3b (1895) 162; Dalla Torre-Harms, Gen. siph. no. 7853 und in der gärtnerischen Literatur.

1 Art in Chile, öfter kultiviert.

Mitraria J. F. Gmel.,

Leitart: *M. Commersonia* Gmel. ist ein Synonym von *Barringtonia* Forst. (1776) und auf dieselbe Art gegründet (Sonnerat, It. Nov. Guin. t. 8, 9 [1776]; cfr. Linné f., Suppl. (1781) 312 u. DC., Prodr. III (1828) 288.

Falls *Mitraria* Cav. nicht geschützt wird, müsste die Gattung eine neuen Namen erhalten.

Als Synonym zu *Mitraria* Cav. wird von Hanstein u. Bentham-Hook. *Diplocalyx* Presl (1844) gestellt, als aus Mexiko stammend beschrieben, was vielleicht auf einem Irrtum beruht.

2432 **Moenchia** Ehrh., Beitr. II (1788) 177

versus

Moenchia Roth, Tent. fl. germ. I (1788) 273.

Moenchia Ehrh., Caryophyllaceae,

ist oft als Gattung angenommen worden: Engler-Prantl, Pffam. III, 1b (1889) 81; 2. Aufl. 16c (1934) 322; Dalla Torre & Harms, Gen. siph. no. 2432; Maly in Oesterr. bot. Zeitschr. LVII (1907) 157; Graebner in Aschers. u. Graebn., Syn. V, 1 (1917) 565; Williams in Bull. Herb. Boiss. 2. sér. II (1902) 602.

Leitart: *M. quaternella* Ehrh. (*Sagina erecta* L. [1753]).

Moenchia Roth, Cruciferae,

ist gegründet auf 4 Arten: *Draba aizoides* L., *Draba incana* L., *Alyssum campestre* L., *Myagrum sativum* L. Nimmt man *Draba aizoides* L. als Leitart an, so bleibt die Gattung Synonym von *Draba* L. (1753).—Welche von beiden Gattungen zuerst publiziert wurde, ist nicht sicher zu ermitteln. Das Vorwort trägt bei Ehrhart das Datum 8. April, bei Roth 21. Januar.

4960 **Mollia** Mart., Nov. gen. et spec. I (1824) 96

versus

Mollia J. F. Gmel., Syst. II (1791) 420.

Mollia Willd., Hort. Berol. (1806) 11, t. 11.

Mollia Mart., Tiliaceae,

angenommen von: Endl., Gen. (1840) no. 5366; Bentham-Hook., Gen. I (1862) 236; Baillon, Hist. pl. IV (1873) 189; Mart. Fl. bras. XII, 3 (1886) 147; Engler-Prantl, Pffam. III, 6 (1890) 23; Dalla Torre & Harms, Gen. Siph. no. 4960; Burret, Notizbl. Bot. Gart. Berl.-Dahlem IX (1926) 843.

Leitart: *M. speciosa* Mart.; 6 Arten im trop. Südamerika.

Mollia J. F. Gmel., Myrtaceae,

ist ein neuer Name für *Jungia* Gaertn. (1788) nec Boehm. (1760)

nec L.f. (1781) nec Loebl. (1758). Die zugrunde gelegte Art *M. imbricata* Gmel. = *Jungia imbricata* Gaertn. wird seit DC., Prodr. III (1828) 230 zu *Baeckea* L. (1753) gestellt. Sollte die Gattung *Mollia* wiederhergestellt werden, so kann dafür *Schidio-myrtus* Schauers, Linnaea XVII (1843) 237, angewendet werden, ein wegen der inzwischen gebildeten *Mollia* Mart. neu gegebener Name.

Mollia Willd., Caryophyllaceae,

ist ein neuer Name für *Polycarpaea* Lam. (nomen conserv., Int. Rules, 3rd ed. [1935] 96), den Willdenow gegeben hat, um eine Verwechselung mit *Polycarpon* Loebl. zu vermeiden.

Für *Mollia* Mart. steht ein weiterer Name nicht zur Verfügung, da zu *Schlechtendahlia* Spreng. nomen nov., Syst. IV cur. post. (1827) 295 ein älteres Homonym (Willdenow 1803) existiert.

9483 **Moquinia** DC., Prodr. VII (1838) 22

versus

Moquinia Spreng. f., Tent. Suppl. (1828) 9.

Moquinia DC., Compositae,

angenommen von: Bentham-Hook., Gen. II (1873) 490; Baker in Fl. bras. VI, 3 (1884) 343; Engler-Prantl, Pffam. IV, 5 (1894) 336; Dalla Torre & Harms, Gen. siph. no. 9483.

Leitart: *M. racemosa* DC.—Etwa 9 Arten, Brasilien und Uruguay.

Moquinia Spreng. f., Lorantheae,

gegründet auf *M. rubra* Spr. f. = *Loranthus elegans* Cham. et Schlecht. (1828) cfr. Sprague in Kew Bull. (1914) 362 ist Typus und einzige Art von *Loranthus* sect. *Moquinia* Sprague l.c. 367.

Moquinia DC. ist ein neuer Name für *Spadonia* Less. (1832) non Fries (1817). Ein weiterer Name steht dafür nicht zur Verfügung.

9545 **Moscharia** Ruiz et Pav., Fl. per. et chil. prodr. (1794) 103

versus

Moscharia Forsk., Fl. aegypt.-arab. (1775) 158.

Moscharia Ruiz et Pav., Compositae,

angenommen von: Endl., Gen. (1838) no. 2955; Bentham-Hook., Gen. II (1873) 503; Gay, Fl. Chil. III (1847) 428; DC. Prodr. VII (1838) 72; Philippi, Cat. Plant. vasc. chil. (1881) 134; Engler-Prantl, Pffam. IV, 5 (1894) 350; Reiche, Fl. Chile IV (1905) 459; Dalla Torre & Harms, Gen. siph. no. 9545.

Einzige Art: *M. pinnatifida* R. et P., Chile.

Moscharia Forsk., Labiatae,

ist *Ajuga Iva* L. (Willd., spec. pl. III, 1 [1800] 12).

Falls *Moscharia* R. et P. nicht geschützt wird, muss dafür *Moschifera* Molina (1810) eintreten.

4020 **Myrtopsis** Engler in Engler-Prantl, Pflfam. III, 4 (1896).
137

versus

Myrtopsis O. Hoffm. in Linnaea XLIII (1881) 133.

Myrtopsis Engler, Rutaceae,

angenommen von: Engler-Prantl, Pflfam. 2. Aufl. 19a (1931) 253; Guillaumin, Révis. du genre *Myrtopsis*, in Bull. Soc. Bot. Fr. LXVII (1920) 64; Dalla Torre & Harms, Gen. siph. no. 4020.

Leitart: *M. novae-caledoniae* Engler; 7 Arten in Neu-Caledonien.

Myrtopsis O. Hoffm., Myrtaceae,

Leitart: *M. malangensis* O. Hoffm., l.c.,
ist von Niedenzu zu *Eugenia* L. (1753) eingezogen worden (Engler-Prantl, Pflfam. III, 7 [1893] 78, 81) und auch von Engler (Pflwelt Afrikas III, 2 [1921] 730, 732) dort belassen worden.

4060 **Naudinia** Planch. et Lind. in Ann. Sc. nat. 3. sér. 19 (1853)
79

versus

Naudinia Rich. in Sagra, Hist. fis. Cuba (1845) 561.

Naudinia Planch. et Lind., Rutaceae,

angenommen von: Benth.-Hook., Gen. I (1862) 285; Engler-Prantl, Pflfam. III, 4 (1897) 167; Dalla Torre & Harms, Gen. siph. no. 4060; Engler-Prantl, 2. Aufl. 19a (1930) 290.

Leitart: *N. amabilis* Planch. et Lind., Colombien.

Naudinia Rich., Melastomataceae,

Leitart: *N. argyrophylla* Rich., l.c. 562, wird jetzt meist zu *Tetrazygia* Rich. (1828) gestellt (cfr. Cogn. in DC., Mon. VII [1891] 724) und zwar gehört die Art zu *T. bicolor* (Mill.) Cogn. (1891). Sollte die Gattung wiederhergestellt werden, so kann dafür der sich völlig damit deckende Name *Miconiastrum* Naud. in Ann. Sc. nat. 3. sér. XV (1851) 341 angewendet werden.

Für *Naudinia* Planch. et Lind. steht kein weiterer Name zur Verfügung.

2790 **Nectandra** Roland. ex Rottboell in Acta litt. univ. hafn. I (1778) 279

versus

Nectandra Berg. Descr. pl. cap. (1767) 131.

Nectandra Roland. ex Rottb., Lauraceae,

angenommen von: Meissn. in DC. Prodr. XV, 1 (1864) 146 et in Fl. brasil. V, 2 (1866) 250; Endl., Gen. (1837) no. 2044; Baillon, Hist. pl. II (1870) 477; Bentham-Hook., Gen. III

(1880) 159; Mez in Berl. Bot. Jahrb. V (1889) 393; Hemsley, Biol. Centr. Amer. III (1882) 74; Engler-Prantl, Pflfam. III, 2 (1891) 116.

Leitart: *N. sanguinea* Roland. ex Rottb.—Über 100 Arten in trop. Amerika.

Nectandra Berg, Thymelaeaceae,

Leitart: *N. sericea* Berg, ist schon seit langem zu *Gnidia* L. (1753) gestellt worden (*N. tetrandra* Berg zu *Struthiola*) und seitdem dort geblieben. Es ist nicht anzunehmen, dass die Gattung wiederhergestellt werden könnte. *Nectandra* Roland. ist unbedingt wegen der grossen Artenzahl zu schützen.

5040 **Neesia** Blume in Nova Acta Acad. nat. cur. XVII (1835)
P.1, 83

versus

Neesia Spreng., Anleit. ed. 2, II (1818) 547.

Neesia Blume, Bombacaceae,

angenommen von: Endl., Gen. (1840) n. 5308; Bentham-Hook., Gen. I (1862) 213; Engler-Prantl, Pflfam. III, 6 (1890) 68; Ridley, Fl. Mal. Penins. I (1922) 265; Hook. f., Fl. Brit. Ind. I (1874) 352.

Leitart: *N. altissima* Blume.—5 Arten in Malesien u. Hinterindien.

Neesia Spreng., Compositae,

ist ein neuer Name für *Diotis* Desf. (1798) non Schreb. (1791). *Diotis* Desf. wird meist als gültig angenommen, weil *Diotis* Schreber als Synonym zu *Eurotia* Adans. (1763), Chenopodiaceae, gestellt wird. *Neesia* Spreng. kann verworfen werden, wenn *Diotis* Desf. gegen *Diotis* Schreber geschützt wird.

Für *Neesia* Blume mit den Synonymen *Esenbeckia* Blume, Bijdr. (1825) 118 non H.B.K. (1825), *Blumea* Reichb., Consp. (1828) 209 non Nees (1823) nec DC. (1833) (nomen conservatum!) müsste der Name *Cotylephora* Meissn. Gen. Comm. (1837) 28, der wegen *Esenbeckia* Kunth gegeben wurde, angenommen werden.

6382 **Niemeyera** F. v. Muell., Fragm. VII (1870) 114

versus

Niemeyera F. v. Muell., Fragm. VI (1867) 96.

Niemeyera F. v. Muell. (1867), Orchidaceae,

einzige Art *N. stylidioides* F. v. M.,

ist ein Synonym von *Apostasia* Blume und auch von Mueller als solches behandelt worden.

Niemeyera F. v. Muell. (1870), Sapotaceae,

einzige Art *N. prunifolia* F. v. M.,

angenommen in Engler-Prantl, Pflfam. IV, 1 (1897) 148,

Dalla Torre & Harms, Gen. siph. n. 6382, und Mueller, Census (1882) 91; II (1889) 154.—Bentham-Hooker f., Gen. pl. II (1876) 633 und F. M. Bailey, Queensland Flora III (1900) 953 haben die Gattung wieder zu *Chrysophyllum* gestellt.

Es empfiehlt sich, *Niemeyera* F. v. Muell. (1870) zu schützen, da ein weiterer Name dafür nicht zur Verfügung steht.

3784 *Nissolia* Jacq., Enum. pl. Carib. (1760) 7

versus

Nissolia Mill., Gard. Dict. Abr. Ed. 4 (1754).

Nissolia Jacq., Leguminosae,

angenommen von: Bentham-Hook., Gen. I (1865) 513; Benth. in Flor. brasil. XV, 1 (1859) 77; Hemsley, Biol. Centr. Amer. Bot. I (1879/81) 268; Engler-Prantl, Pflfam. III, 3 (1894) 317; Rose in Contr. U. S. Nat. Herb. 5 (1899) 157; Standl., Trees and shrubs Mexico (1922) 487.

Leitart: *N. fruticosa* Jacq.—5 Arten in trop. Amerika bis Mexiko.

Nissolia Mill., Leguminosae,

cfr. Druce in Rep. Bot. Exch. Club Brit. Isles (1913) III, 434 = *Nissolia* Moench 1794 [= *Nissolia* Tourn.] = *Lathyrus* *Nissolia* L. (1753) wird seit langem zu *Lathyrus* gestellt: *Lathyrus* sect. *Nissolia* Reichb. (1832).

2513 *Nymphaea* L. em. Smith in Sibth. et Smith, Fl. graec. prodr. I (1808/9) 360

versus

Nymphaea L. em. Salisb., Ann. Bot. II. (1806) 69–76.

Nymphaea L. em. Smith, Nymphaeaceae,

Leitart: *N. alba* L. Syn. prius rejic. *Castalia* Salisb. in Ann. Bot. II. (1806) 71, cfr. Briquet et Conard infr. cit.

Nymphaea L. em. Salisb., Nymphaeaceae,

Leitart: *Nymphaea lutea* L. ist gegenüber *Nuphar* Smith in Sibth. et Smith, Fl. graec. prodr. I (1808/9) 361 zu verwerfen; cfr. Briquet, Prodr. Fl. Corse I (1910) 577 et Conard in Rhodora XVIII (1916) 161. *Nuphar* Smith ist gegenüber dem von Fernald in Rhodora XXI (1919) 183 gebrauchten, älteren Namen *Nymphozanthus* L. C. Rich., Anal. du Fruit (Maio 1808) 63, 68, 103 als nomen conserv. vorgeschlagen (Int. Rules 3. ed. [1935] 134).

* Cfr. Greene in Bull. Torr. Bot. Club XIV. (1887) 257, XV. (1888) 84 et Britten in Journ. of Bot. XXVI. (1888) 6.

9322 *Oedera* L., Mant. II (1771) 159

versus

Oedera Crantz, De duab. Dracon. arb. (1768) 13.

Oedera L., Compositae,

angenommen von: Endlicher, Gen. (1838) n. 2635; Flora cap. III (1864/5) 134; Bentham-Hook., Gen. II (1873) 418; Engler-Prantl, Pflfam. IV, 5 (1894) 270; Dalla Torre & Harms, Gen. siphon. n. 9322; Phillips, Gen. S. Afr. Fl. Pl. (1926) 661.

Leitart: *O. prolifera* L. f., Suppl. (1781) 391.—4 Arten, Süd-Afrika.

Oedera Crantz, Liliaceae,

ist auf *Oedera dragonalis* Crantz = *Dracaena Draco* L. gegründet, cfr. Berens, Dissert. de Dracone arb. (1770).

[Zu *Dracaena* L. (1767) wird als fragliches Synonym *Cordyline* Adans., Fam. II (1763) 54 gestellt. Adanson zitiert als Synonyme zu *Cordyline*: "Draco Clusius, sanguis draconis Offic., Aloe Comm. H. 1, t. 21, Linné spec. 321 No. 4." Die beiden letzten Zitate verweisen auf *Aloe hyacinthoides* L. (1753) bzw. *Aloe hyacinthoides* L. v. *zeylanica* L. = *Sansevieria zeylanica* Willd. *Draco* Clusius ist *Dracaena Draco*, ebenso geht wohl "sanguis draconis" auf diese Art. *Cordyline* Adans. ist gegenüber dem nom. conserv. *Cordyline* Juss. (1789) verworfen, damit ist auch *Dracaena* L. gegen *Cordyline* Adans. geschützt.]

Oedera L. müsste einen neuen Namen erhalten, falls der Name nicht geschützt wird.

657 *Orbignya* Mart. ex Endl. Gen. (1837) 257

versus

Orbignya Bert. in Mercurio chileno (1829) 737.

Orbignya Mart., Palmae,

(*Orbignia* Mart., Palmet. Orbign. [1847] 125), angenommen von: Bentham-Hook., Gen. III (1883) 948; Mart. Fl. brasil. III, 2 (1882) 446 (part.); Engler-Prantl, Pflfam. II, 3 (1889) 79; Barbosa Rodr., Sert. Palm. Bras. I (1903) 55; Dalla Torre & Harms, Gen. siph. n. 657; Burret in Notizbl. Bot. Mus. Berl.-Dahlem X (1929) 498.

Leitart: *O. phalerata* Mart., Palmet. Orbign. l.c. 126.—Etwa 20 Arten von Mexico bis Bolivien und Brasilien.

Orbignya Bert., Sapindaceae,

(*Orbignia* Bert. apud Steudel, Nom. ed. 2, I [1841] 222), gegründet auf *O. trifoliata* Bert. = *Llagunoa glandulosa* Don. Diese Art ist seit 1831 bei *Llagunoa* Ruiz et Pav. (1794) belassen worden (Radlkofer in Pflanzenreich Heft 98g [1933] 1342).

Ein weiterer Name für *Orbignya* Mart. ist nicht vorhanden.

7808 *Oreocharis* Benth. in Benth.-Hook. Gen. II (1876) 1021

versus

Oreocharis "Decaisne" Lindl., Veget. Kingd. ed. 1 (1846) 656.

Oreocharis Benth., Gesneriaceae,

angenommen von Clarke in DC. Mon. Phan. V (1883) 63; Forbes et Hemsl. in Journ. Linn. Soc. Bot. XXVI (1890) 226; Engler-Prantl, Pflfam. IV, 3b (1895) 145; Dalla Torre & Harms, Gen. siph. n. 7808; Matsumura, Enum. pl. jap. II, 2 (1912) 577.

Leitart: *Didymocarpus oreocharis* Hance = *Oreocharis Benthami* C. B. Clarke.—6 Arten in China und Japan.

Oreocharis Ldl., Boraginaceae.

Oreocharis Lindl. wurde von diesem Autor Decaisne zugeschrieben. Dieses deutet an, dass die Gattung auf *Lithospermum* Sect. *Oreocharis* Decne basiert worden ist. Unter Art. 42 (3) ist die Veröffentlichung eines Gattungsnamens als gültig anzusehen, wenn ein Hinweis auf eine frühere wirksam veröffentlichte Beschreibung der Gattung als Untergattung oder andere Unterabteilung einer Gattung gegeben ist.

Obwohl Lindley keinen direkten Hinweis hierauf gab, ist immerhin aus seiner Anerkennung Decaisnes als Autor klar zu ersehen, dass die neue Gattung auf *Lithospermum* sect. *Oreocharis* Decne basiert worden ist.

Ein weiterer Name für *Oreocharis* Benth. steht nicht zur Verfügung.

5457 *Ovidia* Meissn. in DC. Prodr. XIV (1857) 524

versus

Ovidia Raf., Fl. Tellur. III (1836) 68.

Ovidia Meissn., Thymelaeaceae,

angenommen von: Bentham-Hook., Gen. III (1883) 190; Baill., Hist. pl. VI (1877) 131; Engler-Prantl, Pflfam. III, 6a (1894) 239; Domke in Bibl. botan. Heft 111 (1934) 128.

Leitart: *O. pillo-pillo* (Gay) Meissn. ex Domke l.c.—Etwa 4 Arten in den Anden.

Ovidia Raf., Commelinaceae,

mit der einzigen Art *O. gracilis* Raf. (ex. Ind. Kew.) ist Synonym von *Commelina* L. (1753).

8176 *Pallasia* Klotzsch in Monatsber. Akad. Berlin (1853) 498

versus

Pallasia Houtt. Handleiding II (1775) 382.

Pallasia Scop. Introd. (1777) 72.

Pallasia L. f., Suppl. (1781) 37.

Pallasia L'Hér. ex Ait. Hort. Kew. III (1789) 498.

Pallasia Klotzsch, Rubiaceae,

angenommen von: Bentham-Hook., Gen. II (1873) 48; Engler-

Prantl, Pflfam. IV, 4 (1891) 36; Schum. in Fl. brasil. VI, 6 (1889) 219; Dalla Torre & Harms, Gen. siph. n. 8176.

Einzige Art: *P. Stanleyana* Kl., Guiana.

Pallasia Houtt., Rutaceae,

ist gegenüber *Calodendron* Thunb. (1782) verworfen (Int. Rules 3. ed. [1935] 100).

Pallasia Scop., Gramineae,

ist gegenüber *Crypsis* Ait. (1789) verworfen (Int. Rules 3. ed. [1935] 89).

Pallasia L'Hér., Compositae,

ist gegründet auf *P. halimifolia* L'Hér. = *Encelia canescens* Lam. (1786). Ueber *Encelia* Adans. (1763) cfr. Blake in Contrib. Gray Herb. XLI (1913) 358.

Pallasia L. f., Polygonaceae,

ist gegründet auf *P. caspica* L. f. Diese Art ist identisch mit *Pterococcus aphyllus* Pallas, der Leitart von *Pterococcus* Pallas (1776 u. 1777). *Pterococcus* wird meist als *Calligonum* L. (1753) Sect. *Pterococcus* Endl. geführt.

4753 *Pancovia* Willd., Sp. pl. II (1799) 285

versus

Pancovia Heist. ex Adans., Fam. II (1763) 294.

Pancovia Willd., Sapindaceae,

angenommen von: Bentham-Hook., Gen. I (1865) 465 (planta dubia); Engler-Prantl, Pflfam. III, 5 (1895) 321; Radlk. in Sitzber. bayer. Akad. VIII (1878) 268, XX (1890) 240, 242, 284; Radlk. in Engl. Pflanzenreich Heft 98c (1932) 799.

Leitart: *P. bijuga* Willd.—Etwa 10 Arten im trop. Afrika.

Pancovia Heist. ex Adans., Rosaceae.

Adanson zitiert dazu nur *Comarum* L. (1753), die Gattung ist also ein Synonym von *Comarum* L. bzw. *Potentilla* L. (1753).

6691 *Parsonsia* R. Br. in Mem. Werner. Soc. I (1809) 64

versus

Parsonsia P. Br., Hist. Jamaica (1756) 199.

Parsonsia R. Br., Apocynaceae,

ist lange allgemein angenommen worden: Endl., Gen. (1838) n. 3417; Benth. Fl. Austr. IV (1869) 317; Benth.-Hook., Gen. II (1876) 711; Engler-Prantl, Pflfam. IV, 2 (1895) 184; Merrill, Enum. Phil. Fl. Pl. III (1923) 338.

Leitart: *Periploca capsularis* Forst.—Etwa 40 Arten von Indien und China bis Australien, Neu-Seeland, Polynesien.

Merrill hat *Parsonsia* R. Br. schon mit Recht wegen der hohen Artenzahl und der langjährigen Anwendung als nomen conservandum vorgeschlagen (in Revist. Sudamer. Bot. I [1934] 97).

Damit wäre *Parsonsia* P. Br. verworfen und es ist zugleich die Frage, ob *Parsonsia* P. Br. oder *Cuphea* P. Br. für die Lythraeengattung gelten soll, entschieden.

8162 **Payera** Baill. in Bull. Soc. Linn. Paris (1878) 178

versus

Payeria Baill. in Adansonia I (1860–61) 50, t. 3.

Payera Baill., Rubiaceae,

angenommen von: Baillon, Hist. pl. VII (1880) 458; Engler-Prantl, Pflfam. IV, 4 (1891) 31; Dalla Torre & Harms, Gen. siph. n. 8162.

Leitart: *P. conspicua* Baill. (einzige Art), Madagascar.

Payeria Baill., Meliaceae,

Leitart: *P. excelsa* Baill.

wurde ursprünglich von Baillon als Euphorbiacee beschrieben, ist dann von Baillon selbst zu *Quivisia* Comm. bzw. *Turraea* L. eingezogen worden (Bull. Soc. Linn. Paris l.c. 178): *P. excelsa* Baill. = *Quivisia decandra* Cav. ex Benth.-Hook., Gen. III (1886) 257.

6889 **Pectinaria** Haw., Suppl. pl. succul. (1819) 14

versus

Pectinaria Bernh., Syst. Verz. Pfl. Erfurt (1800) 113.

Pectinaria Haw., Asclepiadaceae,

angenommen von: Engler-Prantl, Pflfam. IV, 2 (1895) 281; Dalla Torre & Harms, Gen. siph. n. 6889; Flor. Cap. IV, 1 (1909) 867; Phillips, Gen. S. Afr. pl. (1926) 595 (Benth.-Hook., Gen. II [1876] 782, sub *Piarranthus* R. Br.).

Leitart: *P. articulata* Haw.—5 Arten in Südafrika.

Pectinaria Bernh., Umbelliferae,

gegründet auf *P. vulgaris* = *Scandix pecten-Veneris*, die Leitart von *Scandix* L. (1753).

Für *Pectinaria* Haw. ist ein weiterer Name nicht verfügbar.

6468 **Peltanthera** Benth. in Benth.-Hook., Gen. II (1876) 797

versus

Peltanthera Roth, Nov. sp. pl. (1821) 132.

Peltanthera Roth, Apocynaceae,

gegründet auf *P. solanacea*, war schon von Heyne als *Vallaris* erkannt worden. Sprengel, Syst. I (1825) 635, hat die Art zu *Vallaris* als *V. Heynei* Spr. überführt = *V. solanacea* (Roth) Schum. Es ist sehr wahrscheinlich, dass die Art bei *Vallaris* verbleiben wird.

Peltanthera Benth., Loganiaceae,

angenommen von: Engler-Prantl, Pflfam. IV, 2 (1895) 45; Dalla Torre & Harms, Gen. siph. n. 6468.

Einzige Art: *P. floribunda* Benth., Peru.

Ein weiterer Name für *Peltanthera* Benth. steht nicht zur Verfügung.

3998 **Pentaceras** Hook. f. in Benth.-Hook. f., Gen. pl. I (1862) 298

versus

Pentaceros G. F. W. Mey., Prim. fl. esseq. (1818) 136 = *Pentaceras* Roem. et Schult., Syst. V (1819) 570.

Pentaceras Hook. f., Rutaceae,

angenommen von: Benth.-Hook. f., Gen. pl. I (1862) 298; Engler-Prantl, Pflfam. III, 4 (1895) 122, 2. Aufl. 19a (1931) 234; Dalla Torre & Harms, Gen. siph. n. 3998; Francis, Austr. R. For. Tr. (1929) 156.

Leitart (einzige Art): *P. australis* (Muell.) H.f

Pentaceros G. F. W. Mey., Sterculiaceae,

ist auf *P. aculeatus* G. F. W. Mey. gegründet; diese Art ist identisch mit *Buettneria scabra* Loeffl., der Leitart von *Buettneria* Loeffl. (1758) ("Byttneria") cfr. Schum. in Fl. brasil. XII, 3 (1886) 87.

Falls *Pentaceras* Hook. f. nicht geschützt wird, muss die Gattung neu benannt werden.

8265 **Pentagonia** Benth., Bot. Voy. Sulphur (1844) 105

versus

Pentagonia Heist. ex Fabric., Enum. pl. Helmstad. (1759) 184 et *Pentagonium* Schau. in Nova Acta nat. cur. XIX, suppl. 1 (1843) 364.

Pentagonia Benth., Rubiaceae,

angenommen von: Benth.-Hook., Gen. II (1873) 78; Schum. in Mart. Fl. brasil. VI, 6 (1889) 301; Hemsley, Biol. Centr. Amer. Bot. II (1881/2) 38; Baillon, Hist. pl. VII (1880) 457; Engler-Prantl, Pflfam. IV, 4 (1897) 69; Standl. Fl. Panama Canal Zone (1928) 356.

Leitart: *P. macrophylla* Benth. l.c.—Etwa 8 Arten, Central-Amerika bis Brasilien.

Pentagonia Heist. ex Fabr., Solanaceae,

ist gegenüber der geschützten Gattung *Nicandra* Adans. (1763) verworfen (Int. Rules 3. ed. [1935] 107); der Name ist nur von Hiern, Catal. Afr. pl. Welwitsch III (1898) 752 aufgenommen worden.

Pentagonium Schau., Asclepiadaceae,

Leitart: *P. flavum* Schau. (einzige Art), ist schon von Meyen

als *Philibertia* H.B.K. erkannt worden. *Philibertia* H.B.K. (1818) ist seit einiger Zeit wieder als Gattung hergestellt worden (Schlechter in Fedde Repert. XIII [1914] 282).

Pentagonia Vent. ex Steud. Nom. ed. 2, II (1841) 298 ist nur als Synonym von *Specularia* DC. (1830) = *Legouzia* Delarbre (1800) veröffentlicht.

Falls *Pentagonia* Benth. nicht geschützt wird, tritt dafür *Watsonamra* O. Ktze., Revis. Gen. I (1891) 302 ein.

1258 **Petermannia** F. v. Muell., Fragm. II. (1860) 92

versus

Petermannia Klotzsch in Abh. Akad. Berlin 1854 (1855) 74.

Petermannia F. v. Muell., Dioscoreaceae,

angenommen von: Benth.-Hook. f., Gen. III (1883) 746; Engler-Prantl, Pflfam. II, 5 (1888) 136; Bentham, Fl. Austral. VI (1873) 462; Hook., Icon. XIV (1882) t. 1391; Uline in Engl. Jahrb. XXV (1898) 155; Knuth in Engl. Pflzreich Heft 87 (1924) 348; Dalla Torre & Harms, Gen. Siphon. n. 1258.

Leitart (einzige Art): *P. cirrosa* F. v. Muell. l.c.

Petermannia Klotzsch, Begoniaceae,

Leitart: *Petermannia Cumingiana* Kl., ist seit A. DC. in Prodr. XV (1864) 319 als Sektion von *Begonia* geführt worden und es ist kaum zu erwarten, dass die Gattung als solche wieder aufleben wird.

Das weitere Homonym *Petermannia* Reichenb., Nom. (1841) 236 ist nur als Synonym von *Cycloloma* Moq. (1840) publiziert worden.

Falls *Petermannia* F. v. Muell. nicht geschützt wird, muss die Gattung einen neuen Namen erhalten.

3676 **Petteria** C. Presl, Botan. Bemerk. (1844) 139, Abh. Böhm. Ges. Wiss. V, III (1845) 569

versus

Petteria Reichb., Ic. fl. germ. V (1841) 33, t. 220; Nom. (1841) 205.

Petteria Presl, Leguminosae,

angenommen von: Bentham-Hook., Gen. I (1865) 482; Engler-Prantl, Pflfam. III, 3 (1894) 235; Dalla Torre & Harms, Gen. siph. n. 3676; Beck von Managetta, Fl. Bosn. Herzegow. III (1927) 200; Hayek, Prodr. Fl. penins. Balcan. I (1926) 906.

Einzige Art: *P. ramentacea* Presl; Dalmatien, Bosnien, Herzegowina.

Petteria Reichenb., Caryophyllaceae,

gegründet auf *P. graminifolia* (Arduin) Reichb. = *Minuartia graminifolia* (Ard.) Javorka; *Minuartia* L. (1753) sect. *Lanceo-*

latae Fenzl (cfr. Pax u. Hoffm. in Engler-Prantl, Pflfam. 2. Aufl. 16c [1934] 332).

Ein weiterer Name für *Petteria* Presl steht nicht zur Verfügung.

9365 **Peyrousea** DC., Prodr. VI (1837) 76

versus

Peyrousia Poir. in Dict. sc. nat. XXXIX (1826) 363.

Peyrousea DC., Compositae,

angenommen von: Flora cap. III (1864-65) 176; Bentham-Hook., Gen. II (1873) 432; Engler-Prantl, Pflfam. IV, 5 (1894) 283; Dalla Torre & Harms, Gen. siphon. no. 9365; Phillips, Gen. S. Afr. pl. (1926) 667.

Einzige Art: *P. calycina* DC., Kapland.

Osmithyllum Schultz Bip. in Flora XXVII (1844) 675 ist nur als Synonym zu *Peyrousea calycina* publiziert.

Peyrousia Poir., Iridaceae,

ist nur eine Variante von *Lapeyrousia* Pourr. (1788), Leitart: *Gladiolus denticulatus* Lam.

(*Peyrusa* Rich. ex Dunal in DC., Prodr. VII, 2 [1839] 560 ist ein zu *Hornemannia* Vahl, Ericaceae, gehörendes nomen nudum.)

417 **Phyllostachys** Sieb. et Zucc. in Abh. Akad. München III (1843) 745, t. 5

versus

Phyllostachys Torr. in Ann. Lyc. New York III (1836) 404 in observ.

Phyllostachys Sieb. et Zucc., Gramineae,

angenommen von den allermeisten Autoren: Munro in Transact. Linn. Soc. XXVI (1866) 35; Franchet et Sav., Enum. Pl. Japon. II (1879) 182; Bentham-Hook., Gen. III (1883) 1208; Forbes et Hemsley in Journ. Linn. Soc. XXXVI (1904) 438; Engler-Prantl, Pflfam. II, 2 (1887) 93; Hackel, Enum. Gram. Jap. in Bull. Herb. Boiss. VII (1899) 718; Gamble, Bamb. Brit. Ind. in Ann. Bot. Gard. Calcutta VII (1896) 26; Matsumura, Ind. plant. Japon. II, 1 (1905) 92; Hook. f., Fl. Brit. India VII (1897) 386; Camus, Bambusées (1913) 56; Camus in Lecomte, Fl. génér. Indochine VII (1923) 587; Koorders, Excursionsfl. Java I (1911) 169; Rehder, Manual (1927) 73.

Leitart: *Ph. bambusifolia* Sieb. et Zucc. l.c. 746, t. 5, f. 3.

Phyllostachys Torr., Cyperaceae,

gegründet auf *Carex Willdenovii* Schkuhr, wird allgemein als *Carex* Section *Phyllostachyae* Tuckerm. geführt, cfr. Kükenenthal in Engler, Pflanzenreich Heft 38 (1909) 22, 642.

Für *Phyllostachys* Sieb. et Zucc. steht ein weiterer Name nicht zur Verfügung. Der Name ist auch wegen der gärtnerischen Bedeutung zu schützen.

3619 **Pickeringia** Nutt. ex Torrey et Gray, Fl. N. Amer. I (1840) 389

versus

Pickeringia Nutt. in Journ. Acad. Sc. Philadelphia VII (1834) 95.

Pickeringia Nutt. (1840), Leguminosae, angenommen von Benth-Hook., Gen. I (1865) 466; Engler-Prantl, Pflfam. III, 3 (1894) 203; Jepson, Fl. West. Middle Calif. 2. ed. (1911) 215; Jepson, Manual fl. pl. California (1923) 515.

Einzige Art: *P. montana* Nutt., Californien.

Pickeringia Nutt. (1834), Myrsinaceae, gegründet auf *P. panniculata* Nutt. = *Ardisia Pickeringia* Nutt. (1849) = *Ardisia escallonioides* Cham. et Schltd.; *Ardisia* Sw. (1788, nom. conserv.) Sekt. *Pickeringia* Mez in Pflanzenreich Heft 9 (1902) 79.

Für *Pickeringia* Nutt. (1840) hat Greene in Pittonia II (1891) 188 wegen des älteren Homonyms den Namen *Xylothermia* gegeben. Jepson, Fl. West. Middle Calif. 1. ed. (1901) 290 hat diesen Namen angenommen, aber später wieder aufgegeben.

5221 **Pierrea** Heim in Bull. Soc. Linn. Paris (1891) 958 et Recherch. Diptérocarp. (1892) 78

versus

Pierrea Hance in Journ. of Bot. XV (1877) 339.

Pierrea Heim, Dipteroocarpaceae, angenommen von: Engler-Prantl, Pflfam. III, 6 (1895) 268; Brandis in Journ. Linn. Soc. Bot. 31 (1893) 113; Merrill, Enum. Bornean plants (1921) 408.

Einzige Art: *P. pachycarpa* Heim, noch ungenügend bekannt.

Pierrea Hance, Flacourtiaceae, gegründet auf *P. dictyoneura* Hance l.c., ist von Warburg als Section zu *Homalium* Jacq. (1760) gestellt worden und seitdem dort belassen (cf. Engler-Prantl, Pflfam. 2. Aufl. 21 [1925] 427).

567 **Pigafetta** Beccari, Malesia I (1877) 89

versus

Pigafetta Adans., Fam. II (1763) 223.

Pigafetta Becc. (l.c. *Pigafettia*), Palmae, angenommen von: Benth.-Hook., Gen. III (1883) 933; Engler-Prantl, Pflfam. II, 3 (1889) 48; Beccari in Ann. Roy. Bot. Gard. Calcutta XII, 2 (1918) 99.

Leitart: *P. papuana* Becc. = *P. filaris* (Bl.) Becc.

Beccari hat den Sektionsnamen *Metroxylon* sect. *Pigafetta* Mart. = *Sagus* sect. *Pigafetta* Blume aufgenommen, anfangs als

Pigafettia geschrieben, später in *Pigafetta* geändert, wie schon Benth-Hook. getan hatten.

Pigafetta Adans., Acanthaceae,

gehört als Synonym zu *Eranthemum* L. (1753), diese Gattung wird von Adanson als erstes Synonym zitiert.

Falls *Pigafetta* Beccari nicht geschützt wird, muss die Gattung neu benannt werden.

5585 **Piliocalyx** Brongn. et Gris in Bull. Soc. bot. France XII (1865) 185 et in Ann. Sc. nat. 5. sér. III (1865) 225

versus

Pileocalyx Gasparry in Rendic. Accad. sc. Napoli VI (1847) 409 et in Ann. Sc. nat. 3. sér. IX (1848) 221.

Piliocalyx Brongn. et Gris, Myrtaceae,

angenommen von: Benth-Hook., Gen. I (1867) 1006; Engler-Prantl, Pflfam. III, 7 (1898) 86; Dalla Torre & Harms, Gen. siph. n. 5585; Guillaumin, Cat. Pl. Phanér. Nouv. Caléd. (1911) 83.

Leitart: *P. robustus* Brongn. et Gris.—4 Arten in Neu-Caledonien (Post et Kuntze, Lexic. [1903] 438, haben *Pileocalyx* geschrieben).

Pileocalyx Gasparry, Cucurbitaceae,

ist gegründet auf *P. elegans* Gasparry (*Cucurbita clypeiformis* Bauhin). Naudin (in Ann. Sc. Nat. 4. sér. VI [1856] 14, 20) hat die Art als Synonym zu *Cucurbita maxima* Duch. gestellt und die späteren Autoren sind ihm darin gefolgt. Es ist sehr unwahrscheinlich, dass diese Art von *Cucurbita* abgetrennt werden wird.

8761 **Piptolepis** Schultz Bip. in Pollichia XX/XXI (1863) 380

versus

Piptolepis Benth., Plant. Hartweg. (1840) 29.

Piptolepis Schultz Bip., Compositae,

angenommen von: Benth-Hook., Gen. II (1873) 233; Baker in Fl. Brasil. VI, 2 (1873) 141; Engler-Prantl, Pflfam. IV, 5 (1894) 127.

Leitart: *P. ericoides* Sch. Bip.—8 Arten in Brasilien.

Piptolepis Bth., Oleaceae,

gegründet auf *P. phillyreoides* Bth., ist von Torrey zu *Forestiera* Poir. (1810) gestellt (Bot. Mex. Bound. [1859] 167) und seitdem dort belassen worden.

3269 **Platylophus** D. Don in Edinb. New Phil. Journ. IX (1830) 92

versus

Platylophus Cass. in Dict. sc. nat. XLIV (1826) 36.

Platylophus Don, Cunoniaceae,

angenommen von: Endl., Gen. (1839) n. 4653; Bentham-Hook., Gen. I (1865) 652; Fl. Cap. II (1861/62) 307; Engler-Prantl, Pflfam. III. 2a (1890) 99; 2. Aufl. 18a (1930) 246; Phillips, Gen. S. Afr. Fl. Pl. (1926) 287.

Leitart: *P. trifolius* Don.

Platylophus Cass., Compositae,

ist auf *Centaurea nigra* L. gegründet und seit DC. als Synonym zu *Centaurea* L. Sect. *Jacea* geführt worden. *Platylophus* Cass. ist nur einmal von Fourr. in Ann. Soc. Linn. Lyon N.S. XVII (1869) 96 aufgenommen worden.

Für *Platylophus* Don steht der Name *Trimerisma* Presl (1844) zur Verfügung.

5205 **Platonia** Mart., Nov. Gen. et Spec. III (1829) 168, t. 289

versus

Platonia Raf. in Med. Repos. N. York V (1808) 352, et
Platonia Kunth, Rev. Gram. I (1829) 139, 327, t. 76.

Platonia Mart., Guttiferae,

angenommen von: Endlicher, Gen. (1840) n. 5456; Bentham-Hook. Gen. I (1862) 174; Fl. Brasil. XII, 1 (1888) 467; Engler-Prantl, Pflfam. III, 6 (1893) 242.

Leitart (einzige Art): *P. insignis* Mart. l.c. 169, Brasilien.

Platonia Raf., Verbenaceae,

ist gegründet auf *P. nudiflora* Raf. = *Verbena nudiflora* L. (1753) = *Phyla* Lour. (1790), *Phyla chinensis* Lour.; cfr. Greene, Pittonia IV (1899) 45.

Platonia Kunth, Gramineae,

gegründet auf *P. elata* Kunth, ist von Munro wegen *Platonia* Mart. schon in *Planotia* Munro umbenannt worden (Transact. Linn. Soc. XXVI [1868] 70).

Ein weiterer Name für *Platonia* Mart. steht nicht zur Verfügung.

4637 **Plenckia** Reiss. in Mart. Flora brasil. XI, 1 (1801) 30

versus

Plenckia Raf., Specchio delle Sc. I (1814) 194.

Plenckia Moc. et Sessé ex DC., Prodr. I (1824) 724.

Plenckia Reiss., Celastraceae,

angenommen von: Bentham-Hook., Gen. I (1862) 368; Engler-

450

Prantl, Pflfam. III, 5 (1896) 212; Dalla Torre & Harms, Gen. siph. n. 4637.

Einzige Art: *P. populnea* Reiss., Brasilien.

Plenckia Moç. et Sessé ex DC.

ist ein nomen nudum, zu *Choisya* H.B.K. gehörig.

Plenckia Raf., Aizoaceae,

gegründet auf *P. setiflora* Raf. = *Glinus setiflorus* Forsk. (1775) cfr. DC., Prodr. III (1828) 445, fällt vielleicht mit *Glinus lotoides* L., der Leitart von *Glinus* L. (1753), zusammen. Jedenfalls ist die Art stets bei *Glinus* (bzw. bei anderer Umgrenzung bei *Mollugo*) belassen worden, cfr. Engler-Prantl, Pflfam. 2. Aufl. 16c (1934) 222.

9150 **Podanthus** Lag., Gen. et spec. (1816) 24

versus

Podanthes Haw., Syn. pl. succ. (1812) 32.

Podanthus Lag., Compositae,

angenommen von: Bentham-Hook., Gen. II (1873) 356; Engler-Prantl, Pflfam. IV, 5 (1894) 224; Philippi, Catal. pl. chil. (1881) 174; Reiche, Fl. Chil. IV (1905) 82.

Leitart: *P. ovatifolius* Lag.—2 Arten in Chile u. Argentinien.

Podanthes Haw., Asclepiadaceae,

Leitart *P. pulchra* Haw., ist mit einigen anderen Arten von *Stapelia* abgetrennt worden, ebenso wie andere kleine Gattungen. Diese Abtrennung haben die späteren Autoren sehr bald rückgängig gemacht (cfr. N. E. Brown in Fl. cap. IV, 1 [1909] 925; DC. Prodr. VIII [1844] 655 als Section von *Stapelia*). *Podanthes* Haw. ist aber von Benth., Gen. II (1876) 783 wieder angenommen worden.

In Bentham-Hook. Gen. II sind beide Namen nebeneinander als gültig angesehen.

3789 **Poiretia** Vent., Choix (1803) t. 42

versus

Poiretia J. F. Gmel., Syst. II (1791) 263.

Poiretia Cav., Icon. IV (1797) 25, t. 343.

Poiretia Vent., Leguminosae,

angenommen bei DC. Prodr. II (1825) 315; Endlicher, Gen. (1840) n. 6595; Mart. Fl. brasil. XV, 1 (1859) 77; Bentham-Hook., Gen. I (1865) 513; Hemsley, Biol. Centr. Amer. Bot. I (1879/81) 269; Engler-Prantl, Pflfam. III, 3 (1894) 318; Dalla Torre & Harms, Gen. siph. n. 3789.

Leitart: *P. scandens* Vent. l.c.—5 Arten, trop. Amerika.

Poiretia Cav., Epacridaceae,

gegründet auf *P. cucullata* Cav.; diese Art fällt mit der Leitart von *Sprengelia* Smith (1794), *S. incarnata* Sm., zusammen (Lam. Encycl. [1816] Suppl. IV, 450).

Poiretia Gmel., Rubiaceae,
zitiert wird Walter, Fl. carolin. 86 : *P. erecta* und *P. procumbens*.
Poiretia Gmel. ist bei Michaux, Fl. bor. am. I (1843) 84 Synonym
zu *Houstonia*. Pursh, Fl. Amer. sept. I (1814) 106 hat *P. erecta*
Gmel. als Synonym zu *Houstonia coerulea* L. der Leitart von
Houstonia L. (1753) gesetzt; bei Lam., Encycl. (1816) Suppl. IV.
450 ist das als fraglich bezeichnet.

Ein weiterer Name für *Poiretia* Vent. steht nicht zur Ver-
fügung.

6045 *Polemannia* Eckl. et Zeyh., Enum. (1837) 347
versus

Polemannia Berg ex Schlechtend. in Linnaea I (1826) 250.

Polemannia Eckl. et Zeyh., Umbelliferae,
angenommen von: Endlicher, Gen. (1839) n. 4431; Bentham-
Hook., Gen. I (1867) 909; Flora cap. II (1862) 550; Phillips
Gen. S. Afr. Fl. Pl. (1926) 453; Dalla Torre & Harms, Gen. siph.
n. 6045; Engler-Prantl, Pflfam. III, 8 (1898) 203.

Leitart: *P. grossulariifolia* Eckl. et Zeyh.—2 Arten in
Südafrika.

Polemannia Berg, Liliaceae,
gegründet auf *P. hyacinthiflora* Berg, ist von Baker, Journ.
Linn. Soc. XI (1871) 398 zu *Dipcadi* Medik. (1790) gestellt
(als *D. hyacinthoides*) und es ist nicht anzunehmen, dass die
Art wieder abgetrennt wird.

2467 *Pollichia* Soland. in Ait., Hort. kew. ed. 1, I (1789) 5
versus

Pollichia Schrank in Acta Acad. mogunt. Erfurt (1781) 35 et
Pollichia Medik., Bot. Beob. (1783) 247.

Pollichia Soland. in Ait., Caryophyllaceae,
angenommen von: Bentham-Hook., Gen. III (1880) 14; Engler-
Prantl, Pflfam. III, 1b (1889) 89; 2. Aufl. 16c (1934) 302; Phillips,
Gen. S. Afr. Fl. Pl. (1926) 255; Burt-Davy, Flow. pl. Transv.
(1926) 173 u. a. (cfr. C. A. Smith in Kew Bull. [1931] 198).

Leitart: *P. campestris*.

Pollichia Medik., Boraginaceae,
ist gegenüber *Trichodesma* R. Br. (1810) verworfen (Int. Rules
3. ed. [1935] 106).

Pollichia Schrank, Labiatae,
gegründet auf *P. Galeobdolon* Schrank, ist Synonym von *Gale-
obdolon* Adans. (1763) 190=*Galeopsis* Tourn. t. 86.

Pollichia Soland. ist schon von C. A. Smith in Kew Bull.
(1931) 198 als nomen conservandum vorgeschlagen worden.
Wird der Name nicht geschützt, so muss *Meerburgia* Moench
(1802) dafür eintreten.

6702 *Prestonia* R. Br. in Mem. Werner. Soc. I (1809) 69
versus

Prestonia Scop., Introd. (1777) 281.

Prestonia R. Br., Apocynaceae,
angenommen von: Endlicher, Gen. (1838) n. 3425; Muell. Arg.
in Mart. Fl. brasil. V, 1 (1868) 161; DC. Prodr. VIII (1844) 428;
Benth.-Hook., Gen. II (1876) 700; Engler-Prantl, Pflfam. IV,
2 (1895) 188.

Leitart: *P. tomentosa* R. Br.—Ueber 30 Arten, Mexico bis
Brasilien.

Prestonia Scop., Malvaceae,
ist im Index Kew. noch mit *Abutilon* Adanson identifiziert.
Scopoli zitiert *Laess* Adans.; *Lass* Adans., Fam. II (1763) 400
ist gegründet auf Plumier Ic. ed. Burmann (cfr. Adans. l.c. I,
17)=*Pavonia spinifex* (L.) Cav.; cfr. Urban, Plumiers Leben und
Schriften (1920) 35, 36. *Pavonia* Cav. (1768) ist gegen *Prestonia*
Scop. und *Lass* Adans. geschützt (Intern. Rules 3. ed. [1935]
102).

Prestonia R. Br. ist als nomen conserv. vorzuschlagen. Ob
einer der Namen *Exothostemon* G. Don (1838) oder *Haemadiction*
Ldl. (1825) dafür eintreten könnte, hängt von der Umgrenzung
der Gattung ab.

929 *Pritzelia* F. v. Muell., Descr. papuan pl. (1875) 13
versus

Pritzelia Walp. Rep. II (1843) 428.

Pritzelia Schau., in Flora XXVI (1843) 405, Walp. Rep. II (1843)
922.

Pritzelia Klotzsch in Abh. Akad. Berlin 1854 (1855) 107.

Pritzelia F. v. Muell., Philydraceae,
angenommen von: Benth.-Hook., Gen. III, 840 (1883); Engler-
Prantl, Pflfam. II, 4 (1888) 76, 2 Aufl. 15a (1930) 191; Skotts-
berg in Engl., Bot. Jahrb. 65 (1932) 267.

Leitart (einzige Art): *P. pygmaea* (R. Br.) F. v. Muell. in
Westaustralien.

Pritzelia Schau., Myrtaceae,
ist ein nomen nudum, nach Walp. l.c.=*Baeckea* L. sect. *Scholtzia*
(Schau.).

Pritzelia Walp., Umbelliferae,
gegründet auf *P. didiscoides* Walp. l.c.; diese Art ist nach
Bentham, Fl. austr. III (1866) 548 identisch mit *Dimetopia*
pusilla DC. Prodr. IV (1830) 71, der einzigen Art dieser Gattung.
Dimetopia pusilla DC. wird zu *Trachymene* Rudge (1811) gestellt.

Pritzelia Klotzsch, Begoniaceae,

Leitart: *P. Fischeri* Klotzsch, wird seit 1864 als *Begonia*
sect. *Pritzelia* DC. geführt.

Falls *Pritzelia* F. v. Muell. nicht geschützt wird, tritt dafür *Philydrella* Caruel, Nuov. Giorn. bot. ital. X (1878) 91 ein. Dieser Name ist von Caruel wegen der älteren Homonymie gegeben worden, er ist nur von Caruel selbst (in DC., Mon. phan. III [1881] 4) gebraucht worden.

8388 **Psilanthus** Hook. f. in Hook., Icon. pl. (1873) t. 1129

versus

Psilanthus Juss. in Ann. Mus. Paris IV (1805) 396 nomen.

Psilanthus Roem., Synops. Pepon. (1896) 198.

Psilosanthus Necker, Elem. I (1790) 69.

Psilosanthus Necker, Compositae,

=*Serratula* L. pro parte=*Liatris* Schreb. (1791) ist gegenüber *Liatris* verworfen (Int. Rules 3. ed. [1935] 110).

Psilanthus Juss., Passifloraceae,

im Ind. Kew. als Gattung aufgeführt, aber von Jussieu nur als Name einer vielleicht aufzustellenden Gattung vorgeschlagen, gegründet auf *Tacsonia tri-nervia* Juss. l.c., wird als Sektion von *Passiflora* L. (1753) betrachtet, vergl. Harms in Engler-Prantl, Pflfam., 2. Aufl. 21 (1925) 502 (*Tacsonia* sect. *Psilanthus* DC., Prodr. III [1828] 335).

Psilanthus Roem., Passifloraceae,

ist auf *Tacsonia viridiflora* Juss. gegründet, jetzt zu *Passiflora* sect. *Chloropathanthus* Harms l.c. gestellt.

Psilanthus Hook. f., Rubiaceae,

angenommen von: Bentham-Hook., Gen. II (1873) 115; Engler-Prantl, Pflfam. IV, 4 (1897) 108; Oliver, Fl. trop. Afric. III (1877) 185.

Leitart: *P. Mannii* Hook. f.—6 Arten im trop. Afrika.

Pterococcus Hasskarl in Flora XXV Heft 2, (1842) Beibl., 41

versus

Pterococcus Pallas, Reise I (1776) App. 738, II (1777) App. 43.

Pterococcus Hassk., Euphorbiaceae,

ist lange als Sektion behandelt worden: *Plukenetia* sect. *Pterococcus* Benth. in Benth.-Hook., Gen. III (1880) 327, part. Dalla Torre & Harms, Gen. siph. no. 4421, sect. 2.

Pax u. Hoffmann haben die Gattung wiederhergestellt in Engler, Pflanzenreich, Heft 68 (1919) 21 u. in Engler-Prantl, Pflfam. 2. Aufl., 19c (1931) 143.

Leitart: *Pterococcus glaberrimus* Hassk.=*Plukenetia corniculata* Smith (1799).

Pterococcus Pallas, Polygonaceae,

Leitart: *P. aphyllus* Pallas, ist zuletzt von C. A. Mey., Bull. Soc. Acad. Pétersb. VIII (1841) 340 als Gattung behandelt worden; seitdem ist die Gattung als Sektion von *Calligonum* L. (1753) geführt worden.

5632 **Pterolepis** Miq., Comm. phytogr. (1839) 72

versus

Pterolepis Schrad. in Goett. gel. Anzeig. (1821) 2071.

Pterolepis Schrader, Cyperaceae,

ist gegenüber *Schoenoplectus* Palla (1888) verworfen (Int. Rules 3. ed. [1935] 90).

Pterolepis Miq., Melastomataceae,

ist auf *Osbeckia* sect. *Pterolepis* DC. Prodr. III (1828) 140 gegründet.

Leitart *Osbeckia parnassiifolia* DC.; angenommen von: Endl. Gen. (1840) n. 6222; Bentham-Hook., Gen. I (1867) 742; Mart. Fl. brasil. XIV, III (1885) 259; Cogn. in DC. Mon. Phan. VII (1891) 183; Engler-Prantl, Pflfam. III, 7 (1893) 147.—Etwa 30 Arten im trop. Amerika.

Wird *Pterolepis* Miq. nicht geschützt, so müsste dafür *Brachyandra* Naud. in Ann. sc. nat. 3. sér. II (1844) 143 (non Phil. 1860) eintreten; *Brachyandra* Phil. ist aber zur Zeit als Name einer Compositengattung im Gebrauch. Nicht verwendbar ist *Arthrostemma* Naud. l.c. XIII (1849) 355 non Ruiz et Pav. (1802).

4234 **Ptilochaeta** Turcz. in Bull. Soc. natur. Moscou XVI (1843) 52; et in Flora XXVII (1844) 120

versus

Ptilochaeta Nees in Mart. Fl. brasil. II, 1 (1842) 147, t. 8.

Ptilochaeta Turcz., Malpighiaceae,

angenommen von Bentham-Hook., Gen. I (1862) 258; Engler, Pflanzenfam. III, 4 (1890) 66; Niedenzu in Engler, Pflanzenreich, Heft 93 (1928) 566.

Leitart: *P. bahiensis* Turcz.—3 Arten in Brasilien und Argentinien.

Ptilochaeta Nees, Cyperaceae,

einzige Art *P. diodon* Nees l.c., ist von Boeckeler in Linnaea XXXVI (1869) 70, 558 zu *Rhynchospora* Vahl (1806) gestellt worden und seitdem dort belassen.

Ein weiterer Name für die Malpighiaceengattung steht nicht zur Verfügung.

Those names preceded by an asterisk have appeared since the publication of Dalla Torre & Harms, *Genera Siphonogamarum*, and therefore do not bear a number.

2120 *Quinchamalium* Juss. Gen. 75 (1789)

versus

Quinchamalium Molina, *Saggio Chile*, ed. 1, 151 (1782).

Quinchamalium Juss. Santalaceae.

This name, attributed to Jussieu or used in the sense of Jussieu's limitation of the genus, has been adopted by: Lam. Illustr. ii. 125, t. 142 (1797); Ruiz & Pav. Fl. Peruv. ii. t. 107 (1799); Lam. Encycl. 34 (1804); Pers. Syn. i. 212 (1805); R. Br. Prodr. i. 350 (ed. Nees, 206) (1810); Endl. Gen. 325, n. 2070 (1838); Meisn. Gen. 328 (1841); Benth. & Hook. f. Gen. Pl. iii. 220 (1880); Engl. & Prantl, Pflanzenfam. iii. I. 227 (1889); Dalla Torre & Harms, Gen. Siphonog. 135 (1900); Reiche in An. Mus. Nac. Chile, La isla de la Mocha, 82 (1903); Macloskie in Princeton Univ. Exped. Patag. (Rev. Fl. Patag.) 1896-99, viii. Suppl. Bot. 107 (1914); Skottsb. in Svensk. Vet.-Akad. Handl. n.s. lvi. No. 5, 208 (1916); Hauman, Un Viaje Bot. Lago Argent. Patag. 238 (1920); Herrera, *Chloris Cuzcoensis*, 145 (1926).—About 20 species, chiefly from Chile.

Standard species: *Q. chilense* Mol. emend. Lamarck, the original species.

Quinchamalium Molina. Santalaceae.

Quinchamalium Mol. was based in part on *Quinchamali*, Lini folio, Feuillée, Obs. iii. Hist. Pl. Medic. 57 (1725), from whom he took for example the comparison of the leaves with those of *Linaria aurea* Tragi, and the comparison of the flowers with those of *Jasminum*, and the description of the inflorescence as a spike resembling an umbel.

Molina's description is, however, confusing, and although the name has been used by botanists, and sometimes even attributed to Molina, it is always used in the sense amended by Jussieu. To quote the words of Benth. & Hook. f. Gen. Pl. iii. 220 (1880):

"Genus ab auctoribus Molinio tribuitur, sed genus Molinianum, calyce 5-fido corolla 5-fida stylis 3 capsula 3-loculari polysperma, plantam quandam diversissimam refert hodie non determinandam. Jussieu primus genus nostrum constituit."

And also those of Post & Kuntze, Lexic. 474 (1903): "*Quinchamalium* Mol. 1782=genus inextric. confusum (capsula triloc. polysperm.)."

As far as the species *Q. chilense* is concerned Lamarck adopted Molina's name and quoted Feu. Obs. Hist. Pl. Medic. 57 (1725) in synonymy. The species therefore should be called *Q. chilense* Mol. emend. Lam.

The generic name *Quinchamalium* Juss. is put forward without any hesitation for conservation against *Quinchamalium* Mol.

9578 *Rafinesquia* Nutt. in Trans. Amer. Phil. Soc. n.s. vii. 429 (1841)

versus

Rafinesquia Rafin. New Fl. Am. iii. 51 (1836).

Rafinesquia Rafin. Fl. Tellur. ii. 96 (1836).

Rafinesquia Rafin. Sylva Tellur. 79 (1838).

Rafinesquia Nutt. Compositae.

Adopted by: Walp. Rep. vi. 348 (1847); A. Gray in Brewer, Watson & Gray, Bot. Calif. i. 429 (1876); A. Gray, Syn. Fl. N. Amer. i. II. 415 (1884); Engl. & Prantl, Pflanzenfam. iv. V. 365 (1893); Howell, Fl. N. W. Amer. i. 403 (1901); Dalla Torre & Harms, Gen. Siphonog. 579 (1906); Jepson, Man. Fl. Pl. Calif. 995 (1925); Lemée, Dict. Pl. Phan. v. 724 (1934).—Two species from North America.

Standard species: *R. californica* Nutt., the type species.

Rafinesquia Rafin. New Fl. Amer. iii. 51 (1836). Labiatae.

Rafinesquia Rafin. Fl. Tellur. ii. 96 (1836). Leguminosae.

Rafinesquia Rafin. Sylva Tellur. 79 (1838). Bignoniaceae.

The three generic names cited above were published by Rafinesque in rare works, and as far as can be ascertained have not been adopted by botanists. They have been transferred to the three genera *Calamintha*, *Hosackia* and *Jacaranda* respectively, together with their species, as follows:

Rafinesquia Rafin. New Fl. Amer. iii. 51 (1836)=*Calamintha* (2 species).

Rafinesquia Rafin. Fl. Tellur. ii. 96 (1836)=*Hosackia* (2 species).

Rafinesquia Rafin. Sylva Tellur. 79 (1838)=*Jacaranda* (one species).

Nemoseris Greene in Pittonia ii. 192 (1891).

Greene proposed *Nemoseris* as a new name for *Rafinesquia* Nutt. not of Rafinesque 1838, and earlier, and he transferred the two species *R. californica* and *R. neomexicana* to *Nemoseris*. This name has been adopted by Abrams, Fl. Los Angeles and vicinity, 447 (1904); M. Armstrong, Field Book West. Wild Fl. 575 (1915); Davidson & Moxley, Fl. S. Calif. 355 (1923).

Rafinesquia Nutt. is a well-known North American genus. For nearly 100 years the name has been used for this genus of Compositae, being correct under International Rules until 1930, whereas *Nemoseris* Greene has not been at all widely adopted. *Rafinesquia* Nutt. occurs in standard works as recently as 1925 and 1934 (see above bibliography): the writer, therefore, recommends the name for conservation.

7182 **Rapinia** Montr. in Mém. Acad. Lyon, x. 243 (1860)
versus

Rapinia Lour. Fl. Cochinch. i. 127 (1790).

Rapinia Montr. Verbenaceae.

Adopted by : Benth. & Hook. f. Gen. Pl. ii. 1152 (1876) ; Engl. & Prantl, Pflanzenfam. iv. IIIA. 169 (1895) ; Dalla Torre & Harms, Gen. Siphonog. 432 (1904) ; Lemée, Dict. Pl. Phan. v. 739 (1934).—Two species from New Caledonia and adjoining Isles.

Standard species : *R. collina* Montr., the type species.

Rapinia Lour. Campanulaceae.

Adopted by several early botanists such as Sprengel, Anl. ii. I. 456 (1817) ; Roem. & Schult. Syst. iv. p. lv. 682, no. 830 (1819) ; Reichb. Consp. p. 126, n. 3314 (1828) ; Bartl. Ord. 194 (1830). In the Index Kewensis the genus and its one species *R. herbacea* are referred respectively to *Sphenoclea* Gaertn. and *S. zeylanica*. This classification appears to be adopted by later botanists.

The genus *Rapinia* Montr., however, is usually reduced to the genus *Vitex*. Beauvisage in Ann. Soc. Bot. Lyon, xxvi. 62 (1901) adopted the view that it should be united with *Vitex*, and transferred the species *R. collina* Montr. to *Vitex collina* Beauvisage. This view is also held by Guillaumin in Ann. Mus. Col. Marseille, 1911, Sér. II. ix. 205 ; as well as by Spencer Moore in a paper on the systematic account of the plants collected in New Caledonia and the Isle of Pines by R. H. Compton in 1914, contributed to the Journ. Linn. Soc., Bot. xlv. (1921).

It seems, therefore, unnecessary to put forward the name *Rapinia* Montr. for conservation.

923 **Reussia** Endl. Gen. i. 139, n. 1089 (1836)
versus

Reussia Dennst. Schluess. Hort. Malab. 33 (1818).

Reussia Endl. Pontederiaceae.

Adopted by : Endl. Ench. 81 (1841) ; Meisn. Gen. 301 (1842) ; Mart. Fl. Bras. iii. I. 96 (1847) ; Solms-Laub. in DC. Monogr. iv. 534 (1883) ; Engl. & Prantl, Pflanzenfam. ii. IV. 74 (1888) ; Dalla Torre & Harms, Gen. Siphonog. 58 (1900) ; Lemée, Dict. Pl. Phan. v. 772 (1934).—Two species from South America.

Standard species : *R. triflora* Seub., the type species.

Reussia Dennst. Rubiaceae.

In Steud. Nom. Bot. ed. 2, ii. 443 (1841), the genus is referred to *Paederia*. In the Index Kewensis it is also referred to *Paederia*, and has apparently not been regarded as an independent genus by any botanists subsequently. The only species *R. sarmentosa* has become a synonym of *Paederia tomentosa*.

The generic name *Reussia* Endl. appears to have no later avail-

able synonym, so that unless the name be conserved, a new name must be given to the genus, and the species must be transferred to it. In order to avoid undue changes in nomenclature, and as the earlier *Reussia* Dennst. is never likely to be revived, the generic name *Reussia* Endl. is here put forward for conservation.

3871 **Rhodopsis** Urb. Symb. Antill. ii. 304 (1900)
versus

Rhodopsis Lilja, Fl. Sverig. Suppl. i. 42 (1840).

Rhodopsis Reichb. Nom. 168 (1841).

Rhodopsis Urb. Leguminosae.

Adopted by : Dalla Torre & Harms, Gen. Siphonog. 243 (1901) ; Post & Kuntze, Lexic. 483 (1903) ; Urb. Symb. Antill. viii. 304 (1920) ; Lemée, Dict. Pl. Phan. v. 809 (1934).—One species from Haiti and S. Domingo.

Standard species : *R. planisiliqua* Urb., based on *Erythrina planisiliqua* L., the type.

Rhodopsis Lilja. Portulacaceae.

This genus is not kept up. When it was founded it had two species, *R. discolor* and *R. speciosa*, and nothing further has been added to it. Pfeiffer, Nom. Bot. ii. II. 957 (1847) reduced *Rhodopsis* Lilja to *Cistanthe* Spach. Index Kewensis, ii. p. 712. and Dalla Torre & Harms, Gen. Siphonog. 155 (1900) reduce it to *Calandrinia* H.B.K. (1823), and Post & Kuntze, Lexic. 483 (1903) reduce it to *Claytonia* L. (1753).

This genus is not likely to be revived.

Rhodopsis Reichb. Rosaceae.

This genus was founded on Endlicher's section *Rhodopsis* of the genus *Rosa*. No species were transferred to it and no one since Reichenbach appears to have kept up the name. In all cases it is reduced to *Rosa*.

The genus *Rhodopsis* Urb. contains only the one species, and if a later name were available one would not consider conserving *Rhodopsis* Urb. There is, however, no later synonym, and therefore, in order to avoid finding a new name, *Rhodopsis* Urb. is here put forward for conservation.

5676 **Rhynchanthera** DC. Prodr. iii. 106 (1828)
versus

Rhynchanthera Bl. Bijdr. Tabell. 78 (1826).

Rhynchanthera DC. Melastomataceae.

Adopted by : Mart. Nov. Gen. iii. 120 (1829) ; G. Don, Gen. Syst. ii. 736 (1832) ; Chamisso in Linnaea, ix. 377 (1834) ; Endl. Gen. i. 1208, n. 6183 (1841) ; Benth. & Hook. f. Gen. Pl. i. 738 (1865-7) ; Hemsl. Biol. Centr.-Amer. i. 415 (1880) ; DC. Monogr. Phan. vii. 97 (1891) ; Engl. & Prantl, Pflanzenfam. iii.

VII. 162 (1893); Dalla Torre & Harms, Gen. Siphonog. 354 (1903); Standley (Trees & Shrubs of Mexico) in Contrib. U.S. Nat. Herb. xxiii. 1048 (1924); Lemée, Dict. Pl. Phan. v. 820 (1934).—About 50 species from North America, Mexico and Brazil.

Standard species: *R. grandiflora* (Aubl.) DC., probably the most historic and best-known species.

Rhynchanthera Bl. Orchidaceae.

In the Index Kewensis it is quoted from Blume, Bijdr. Tabell. 78 (1826). Up to the present the writer has failed to find any copy of Blume's Bijdr. containing Tabell. 78; in the Kew copy the number reaches 73. Letters received from Prof. Dr. Pulle from Utrecht and Prof. Dr. Lam from Leiden state that the copies in their libraries are not as complete as the Kew copy. Pfeiffer indexes the name of the genus as follows: "Rhynchanthera Bl. MSS. ?=Rhynchandra Reichb. 1841," which shows that he too could not trace the publication of these plates from no. 73 onwards. It is possible that these tabellae were not published. On the other hand Blume himself quotes them as late as 1858; see Blume, Collection des Orchidées, i. 125 (1858) where he reduces *Rhynchanthera* Bl. Bijdr. (1825-26) fig. 78 to *Corymorchis*, and the species *R. paniculata* to *Corymorchis veratrifolia*. The name *Rhynchanthera* Bl. appears to have been adopted by no one.

If the view is taken that these last Tabellae of Blume are unpublished, then there is no need to conserve *Rhynchanthera* DC.

In the meantime as *Rhynchanthera* DC. is such a well-known genus, and contains a large number of species, the name is here put forward for conservation.

* *Rhynchocharpa* Becc. in Webbia, v. 105 (1921)
versus

Rhynchocharpa Schrad. in Linnaea, xii. 403 (1838).

Rhynchocharpa Backer ex K. Heyne, Nutt. Pl. Ned.-Ind. ed. 2, ii. 739 (1927).

Rhynchocharpa Becc. Palmae.

Adopted by: Lemée, Dict. Pl. Phan. v. 822 (1934).—One species from New Caledonia.

Standard species: *R. Vieillardii* (Wendl.) Becc., the type.

Rhynchocharpa Schrad. Cucurbitaceae.

This genus containing many species has been reduced to *Kedrostis* Medik. (1791). See Index Kewensis, ii. 712; Dalla Torre & Harms, Gen. Siphonog. 514; Post & Kuntze, Lexic. 493. Several of the earlier botanists, however, kept up the name; see Pfeiffer, Nom. Bot. ii. II. 961.

Rhynchocharpa Backer. Leguminosae.

Heyne gives no generic description. It is possible that it may have been published elsewhere, but the writer has been unable to trace any earlier reference.

Rhynchocharpa Becc. is monotypic, with a restricted distribution. Although the earlier homonym *Rhynchocharpa* Schrad. may not be revived as an independent genus, it is doubtful whether it is advisable to conserve the name *Rhynchocharpa* Becc. It seems almost preferable to give it a new name, as there also exists *Rhynchocharpus* Less. Syn. Comp. 382 (1832)=*Relbania* L'Hérit. (Compos.) which has also been called *Rhynchocharpa* Less.

Rhynchocharpa Becc. is, accordingly, not recommended for conservation.

* *Rhynchopera* Börner in Abh. Nat. Ver. Bremen, xxi. 272 (1913)
versus

Rhynchopera Klotzsch in Link, Klotzsch & Otto, Ic. Pl. Rar. 103, t. 41 (1841).

Rhynchopera Börner. Cyperaceae.

Based on *Carex paniculata* L. It seems very unlikely that botanists will adopt this genus. Kükenthal in Engl. Pflanzenreich, Cyperac.-Caricoid. 181 (1909) considered *Carex paniculata* L. a good species of *Carex*.

Rhynchopera Klotzsch. Orchidaceae.

This genus is no longer kept up. Almost all botanists regard it as a synonym of *Pleurothallis* R. Br. (1813). See Index Kewensis, ii. 716, and Dalla Torre & Harms, Gen. Siphonog. 100.

Although *Rhynchopera* Klotzsch is reduced, there seem scarcely sufficient grounds to warrant the conservation of the generic name *Rhynchopera* Börner.

8464 *Richardia* L. Sp. Pl. ed. 1, 330 (1753). Rubiaceae.

This name is correct under the Rules of Botanical Nomenclature. The following notes, however, are included in this paper as there has been some confusion concerning—

Richardia L. Rubiaceae.

Richardsonia Kunth in Mém. Mus. Paris, iv. 430 (1818) Rubiaceae,
and

Richardia Kunth, l.c. 437. Araceae.

Richardsonia Kunth.

Kunth changed the name *Richardia* L. to *Richardsonia* on the grounds that as the name commemorated Richardson, it was a more suitable formation. Richardson's Christian name, however, was Richard, and Linné was quite at liberty to name the genus after the Christian name of the man. *Richardsonia*

Kunth, therefore, is a superfluous name and illegitimate. It is also illegitimate in being a later homonym of *Richardsonia* Necker, Elem. Bot. iii. 337 (1790), a genus of Hepaticae.

Richardia Kunth. Araceae.

As Kunth changed the name *Richardia* L. to *Richardsonia*, he felt himself at liberty to give the name *Richardia* Kunth to the Araceous genus. This name, however, being a later homonym is illegitimate. It may be added also that *Richardia* Kunth is reduced to *Zantedeschia* Spreng. the latter name being conserved against *Richardia* Kunth.

It is clear, therefore, that *Richardia* L. 1753 is the correct name for the genus of Rubiaceae, and that both *Richardsonia* Kunth and *Richardia* Kunth are illegitimate names.

6254 *Richea* R. Br. Prodr. 555 (1810)

versus

Richea Labill. Voy. i. 186, t. 16 (1798).

Richaëia Petit-Thouars, Gen. Nov. Madag. 25 (1806)

(corr. *Richea* Post & Kuntze, Lexic. 485 (1903).

Richea R. Br. Epacridaceae.

Adopted by: Poiret, Dict., Suppl. iv. 680 (1816); Roem. & Schult. Syst. iv. p. xliii. 488, n. 785 (1819); Spreng. Syst. i. 631, n. 679 (1825); Reichb. Consp. p. 128, n. 3344 (1828); Hook. f. Fl. Tasm. i. 266 (1857); F. Muell. Fragm. vi. 67 (1867); Benth. & Hook. f. Gen. Pl. ii. 617 (1876); Engl. & Prantl, Pflanzenfam. iv. I. 74 (1889); Rodway, Tasmanian Flora, 124 (1903); Dalla Torre & Harms, Gen. Siphonog. 385 (1903).—About 9 species from Tasmania.

Standard species: *R. dracophylla* R. Br., the type.

Richea Labill. Compositae.

Adopted by very few botanists, including Persoon, Syn. ii. 498, n. 1961 (1807); Spreng. Anl. ii. II. 544 (1818) and Cass. Dict. xlix. 224 (1827). The genus is now included under *Craspedia* Forst. as in Benth. & Hook. f. Gen. Pl. ii. 322 (1873) and Engl. & Prantl, Pflanzenfam. iv. V. 195 (1890).

Richaëia Petit-Thouars and *Richea* are orthographic variants, *Richaëia* therefore is a later homonym, and so an illegitimate name. The genus, however, is not kept up; almost all botanists reduce it either to *Weihea* Spreng., Rhizophoraceae, which is a conserved name, or to the more comprehensive genus *Cassipourea* Aubl. (vide Alston in Kew Bull. 1925, 244).

In view of the fact that *Richea* R. Br. is kept up by almost all authors, and as it contains about 9 species, it seems desirable that the name should be conserved. Failing this the generic name *Cystanthë* R. Br. Prodr. 555 (1810) would be correct under the Rules. This would involve a few name changes, though some of the species of *Richea* have already been renamed under *Cystanthë*.

1332 *Riedelia* Oliv. in Hook. Ic. Pl. xv. t. 1419 (1883)

versus

Riedelia Cham. in Linnaea, vii. 240 (1832).

Riedelia Meissn. in Mart. Fl. Bras. vii. 171 (1863).

Riedelia Trin. ex Kunth, Enum. Pl. i. 515 (1833).

Synonymum prius rejiciendum:

Nyctophylax Zipp. in Alg. Konst. en Letterb. i. 298 (1829).

Riedelia Oliv. Zingiberaceae.

Adopted by: Benth. & Hook. f. Gen. Pl. iii. 1226 (1883); K. Schum. in Engl. Jahrb. xxvii. 325 (1899); Dalla Torre & Harms, Gen. Siphonog. 85 (1900); K. Schum. & Lauterb. Fl. Deutsch. Schutzgeb. 231 (1901); K. Schum. in Engl. Pflanzenreich, Zingiberac. 371 (1904); Valetton in Lorentz, Nova Guinea, viii. 959 (1913); Ridley in Trans. Linn. Soc., Bot. ix. 222 (1916); Loesener in Engl. & Prantl, Pflanzenfam. Aufl. 2, xva. 624 (1930).—About 50 species in Malay and Papua.

Standard species: *R. curviflora* Oliv., the type.

Riedelia Cham. Verbenaceae.

Adopted by scarcely any botanists. Spach, Vég. Phan. ix. 227 (1840) writes the name as "*Ridelia* Cham. & Schlecht." and mentions it merely in a list of genera under a certain section of Verbenaceae. In Engl. & Prantl, Pflanzenfam. iv. IIIA, 151 (1895) and also in Dalla Torre & Harms, Gen. Siphonog. 430 (1904) the genus is reduced to *Lantana* L.

Riedelia Meissn. belongs to the family Ericaceae, and apart from Kuntze, Rev. Gen. 384 (1891) where it is kept up, the genus is almost universally sunk under *Thibaudia*, see Dalla Torre & Harms, Gen. Siphonog. 383 (1908). Benth. & Hook. f. Gen. Pl. ii. 567 (1876) reduced the genus to *Satyria*, which is also included under *Thibaudia* by Dalla Torre & Harms and by A. C. Smith in Contrib. U.S. Nat. Herb. xxviii. II. 519 (1932).

Riedelia Trin. is a manuscript name of Trinius published by Kunth, Enum. Pl. i. 515 (1833), in synonymy with *Arundinella*. It was therefore not validly published.

Nyctophylax Zipp. in Alg. Konst. en Letterb. i. 298 (1829).

This reference is taken from Engl. & Prantl, Pflanzenfam. Aufl. 2, xva. 624 (1930), and up to the present the writer has not been able to trace the work. Pfeiffer quotes the name as Zipp. MS., cf. Flora, 1829, 286, where there is no description of the genus. It is mentioned by Endlicher, Gen. i. 125 (1837) as a doubtful name. Meissner also (Meissn. Comm. 290: 1836-43) mentions it and states it is not known to him. In the Index Kewensis the name is recorded thus: "*Nyctophyla*, Zipp. in Alg. Konst. en Letterbode, i. 298 (1829) "Nomen delendum" cf. Benth. & Hook. f. Gen. iii. 639." The same reference is given by Dalla Torre & Harms, Gen. Siphonog. 585, n. 9747 (1906) and it is placed with genera of uncertain position.

As the genus *Riedelia* Oliv., Zingiberaceae, is very widely accepted, and as the two earlier genera bearing the same name are so little-known, also, as its earlier synonym *Nyctophylax* is very obscure, and may not even have a published description, certainly none unless in the first reference;—the writer has no hesitation in putting forward the name *Riedelia* Oliv. for conservation.

9382 *Robinsonia* DC. in Guillem. Arch. Bot. ii. 333 (1833)

versus

Robinsonia Scop. Introd. 218 (1777).

Robinsonia DC. Compositae.

Adopted by: Decne in Ann. Sc. Nat. Sér. II. i. 27 (1834); DC. Prodr. vi. 447 (1837); Endl. Gen. 461, n. 2821 (1838); Meissn. Gen. 216 (1839); Benth. & Hook. f. Gen. Pl. ii. 441 (1873); Engl. & Prantl, Nat. Pflanzenfam. iv. V. 290 (1892); Dalla Torre & Harms, Gen. Siphonog. 561 (1906); Skottsberg in Nat. Hist. Juan Fernandez & Easter Island, ii. 190 (1922).—About 6 species in Juan Fernandez.

Standard species: *R. macrocephala* Decne., the first and most fully described of the original species; also one of the two species figured by Decne. Skottsberg in his recent classification, places this species in his subgenus I. *Symphyochoeta* (DC.) Skottsb., and the remaining five species in subgenus II. *Eleutherochoeta* (DC.) Skottsb.

Robinsonia Scop. Quinaceae.

A superfluous name for *Touroulia* Aubl. (1775). Adopted by: Schreb. Gen. i. 337, n. 852 (1789); Neck. Elem. ii. 77 (1790); Willd. Sp. Pl. ii. 999 (1800); Pers. Syn. ii. 33 (1807); Spreng. Anl. ii. II. 871 (1818); Spreng. Syst. ii. 489 (1825).

Later botanists such as Benth. & Hook. f. Gen. Pl. i. 176 (1862) have included this genus under *Quina* Aubl., and this reduction is accepted by most botanists including Engler in Engl. & Prantl, Pflanzenfam. Aufl. 2, xxi. 108 (1925).

The generic name *Robinsonia* Scop. is illegitimate, nevertheless, it invalidates the later name *Robinsonia* DC.

The name *Robinsonia* DC., accordingly, is put forward for conservation.

**Robynsia* Hutchinson in Hutchinson & Dalziel, Fl. W. Trop. Afr. ii. I. 108 (1931)

versus

Robynsia Drapiez in Lem. Hort. Univ. ii. 127, 231 (1841).

Robynsia Mart. & Gal. in Bull. Acad. Brux. x. II. 193 (1843).

Robynsia Hutchinson. Rubiaceae.

One species from Nigeria.

Standard species: *R. glabrata* Hutch., the type.

Robynsia Drapiez. Amaryllidaceae.

A genus with one species, now included in *Bravoa* Lex. (1824), see Index Kewensis, Suppl. ii. p. 204; Pfeiffer, Nom. Bot. ii. II. 979; Post & Kuntze, Lexic. 487.

Robynsia Mart. & Gal. Leguminosae.

A genus not kept up, usually included under *Pachyrhizus* Rich. (1825), Leguminosae. See Dalla Torre & Harms, Gen. Siphonog. 245; Index Kewensis, ii. 726;

Since neither of the earlier homonyms is likely to be revived, and since there is no other available name published for *Robynsia* Hutchinson, the name is here recommended for conservation in order to save any nomenclatural change.

3171 *Rochea* DC. Pl. Hist. Succul. t. 103 (1806?)

versus

Rochea Scop. Introd. 296 (1777).

Synonymum prius rejiciendum:

Larochea Pers. Syn. i. 337 (1805).

Rochea DC. Crassulaceae.

Adopted by: Link, Enum. 299 (1821); DC. Prodr. iii. 393 (1828); Endl. Gen. 810, n. 4615 (1839); Harv. in Harv. & Sond. Fl. Cap. ii. 368 (1861-2); Benth. & Hook. f. Gen. Pl. i. 658 (1865); Engl. & Prantl, Pflanzenfam. iii. IIA, 38 (1890); Dalla Torre & Harms, Gen. Siphonog. 198 (1900); Phillips, Gen. S. Afr. Fl. Pl. 285 (1926); Berger in Engl. & Prantl, Pflanzenfam. Aufl. 2. xviiiA. 401 (1930).—About 4 species from South Africa.

Standard species: *R. coccinea* (L.) DC., the best known of the species now retained in the genus.

Rochea Scop. Leguminosae.

This genus appears to have been taken up by no one since Scopoli; it is reduced to *Aeschynomene*.

Larochea Pers. i. 337 (1805).

It would not be necessary to consider the name *Larochea* Pers. (1805) if it were not that the date of publication of *Rochea* DC. (1805? 1806?) is uncertain. Many botanists give the date as 1810? but Schrader in Neues Journal Bot. 1806, p. 73 gives an account of the plates in DC. Pl. Hist. Succul. including t. 103; we may therefore conclude that t. 103 appeared either in 1806 or before that date.

Persoon (1805) also refers to DC. Pl. Hist. but does not give the number of the plate. He does, however, quote *Rochea* DC. as a synonym under *Larochea falcata* Pers., the only other species included in *Larochea* being *L. coccinea* (L.) Pers. It follows, therefore, that—

- (1) if the genus *Rochea* were already published by DC. the name *Larochea* Pers. would be a superfluous name and therefore illegitimate;
- (2) if the name *Rochea* DC. were published after 1805, *Larochea* is the earliest name given to the genus, and must be rejected if *Rochea* DC. is conserved.

The name *Larochea* Pers. was adopted by some of the earlier botanists, including Hedw. Gen. p. 212 (1806); Haw. Syn. Succ. 50 (1812); Schult. Syst. vi. p. lxvii. 707 (1820); Reichb. Nom. 158, n. 6182 (1841). As far as can be ascertained no recent botanists keep up this generic name.

The genus *Rochea* DC. is very well known both in its own country of S. Africa and also throughout the horticultural world, the various species being sold under that generic name. It is therefore put forward for conservation.

7124 *Rochelia* Reichb. in Flora, vii. 243 (1834)

versus

Rochelia Roem. & Schult. Syst. iv. p. xi. 108 (1819).

Rochelia Reichb. Boraginaceae.

Adopted by: Ledeb. Fl. Alt. i. 172 (1829); Endl. Gen. 651, n. 3787 (1839); Meissn. Gen. 279 (1840); DC. Prodr. x. 175 (1846); Walp. Rep. vi. 564 (1847); Boiss. Diagn. Sér. II. iii. 136 (1856); Benth. Fl. Austral. iv. 408 (1869); Benth. & Hook. f. Gen. Pl. ii. 852 (1876); Engl. & Prantl, Pflanzenfam. iv. IIIA, 131 (1895); Post & Kuntze, Lexic. 487 (1903); Dalla Torre & Harms, Gen. Siphonog. 429 (1904); Hochr. in Ann. Conserv. & Jard. Bot. Genève, vii-viii. 195 (1904); Lazaro & Ibiza, Comp. Fl. Esp. ii. 491 (1907); Johnston in Contrib. Gray Herb. n.s. lxxiii. 65 (1924); Hegi, Illustr. Fl. Mittel-Eur. v. III. 2129 (1927).—From 10–15 species from the Mediterranean Region, Central Asia and Australia.

Standard species: *R. saccharata* Reichb., the type species=
R. disperma (L.) Wettst.

In a large number of works the name *R. stellulata* is used instead of *R. saccharata*. *R. stellulata* was published in Reichb. Pl. Crit. t. 123, December 1824, and it has a cross reference to *R. saccharata* Reichb. which was published in April, 1824. Neither name, however, is correct under the International Rules as they were based on *Lithospermum dispernum* L., hence the epithet "disperma" must be retained, if possible, as was done by Wettstein, viz. *R. disperma* (L.) Wettst. apud Stapf in Denkschr. Akad. Wiss. Wien, 1885, l. 31.

Rochelia Roem. & Schult. Boraginaceae.

This genus appears to have been reduced to other genera by almost all botanists. Nuttall in Journ. Acad. Philad. vii. 44 (1834) described one new species, *R. patens* Nutt., and quoted

another, *R. glomerata* Torr., but he quoted no author for the genus. Both these species, however, have been transferred to other genera, and A. Brand in Engl. Pflanzenreich, Boraginac. p. 126 (1931) reduces *R. patens* Nutt. to *Hackelia floribunda* (Lehm.) Johnston, and *R. glomerata* Torr. to *Oreocarya glomerata* (Fraser) Greene (A. Brand, l.c. p. 82).

Since therefore, *Rochelia* Roem. & Schult. has been reduced almost universally, the generic name *Rochelia* Reichb. is put forward for conservation, the genus being well known, retained by most botanists, and consisting of some 10–15 species.

2849 *Roemeria* Medik. in Usteri, Ann. Bot. iii. 15 (1792).
Papaveraceae.

It seems advisable to call attention to this generic name. It is the first of many such names, all given later than 1792, e.g., Moench (1794) Amaranthaceae; Thunberg (1798) Anacardiaceae, Myrsinaceae, Sapotaceae; Trattinick (1802 and 1821) Capparidaceae; Zea (1817) Gramineae; Dennst. (1818) Campanulaceae; Raddi (1820) Hepaticae. All except *Roemeria* Medik. have been reduced to other genera.

Roemeria Raddi is put forward by Schniffer as a nomen rejiciendum, see Briquet, Rec. Syn. 115 (1930), in favour of *Riccardia* Gray (1821).

As, however, it is a later homonym it must be rejected.

This may make *Riccardia* Gray the earliest legitimate name for this genus of Hepaticae and thereby render unnecessary the conservation of that name.

3092 *Roeperia* F. Muell. in Hook. Kew Journ. ix. 15 (1857)

versus

Roeperia Spreng. Syst. iii. 13, 147 (1826).

Roeperia F. Muell. Capparidaceae.

Adopted by: Engl. & Prantl, Pflanzenfam. iii. II. 224 (1891); Dalla Torre & Harms, Gen. Siphonog. 192 (1901); Ewart & Davies, Fl. N. Territ. 115 (1917).—One species from Northern Australia.

Standard species: *R. cleomoides* F. Muell, the type.

In the following works the genus *Roeperia* F. Muell. is *not* kept up:—

Benth. & Hook. f. Gen. Pl. i. 106 (1862); Benth. Fl. Austral. i. 91 (1863); Bailey, Queensl. Fl. i. 56 (1899); Bailey, Comp. Cat. Queensl. Pl. 36 (1913).

In all the above cases the monotypic genus *Roeperia* is included under *Gynandropsis* DC., and *R. cleomoides* is referred to *Gynandropsis Muelleri* Benth.

Roeperia Spreng. Euphorbiaceae.

As far as can be ascertained this genus has not been retained by any botanists except Sprengel himself in his Gen. ii. 564, n. 2757 (1831).

As, however, the genus *Roeperia* F. Muell. is frequently referred to *Gynandropsis*, and it consists only of one species, the name is not put forward for conservation.

If the genus is regarded as independent it will have to be called *Justago* O. Kuntze, Rev. Gen. 1. 39 (1891). Kuntze also transferred the species to *Justago clemoides*.

3659 *Rothia* Pers. Syn. ii. 638 (1807)

versus

Rothia Schreb. Gen. 531 (1791).

Rothia Lam. in Journ. Hist. Nat. Paris, ii. 16 (1792).

Rothia Borkh. Tent. Dispos. Pl. Germ. 43 (1792).

Synonymum prius rejiciendum :

Dillwynia Roth, Cat. Bot. iii. 71 (1806).

Rothia Pers. Leguminosae.

Adopted by : DC. Prodr. ii. 382 (1825) ; G. Don, Gen. Syst. ii. 342 (1832) ; Wight & Arn. Prodr. i. 195 (1834) ; Endl. Gen. 1263, n. 6475 (1840) ; Benth. in Hook. Lond. Journ. Bot. ii. 459 (1843) ; Benth. Fl. Austral. ii. 185 (1864) ; Benth. & Hook. f. Gen. Pl. i. 477 (1865) ; Baker in Fl. Trop. Afr. ii. 7 (1871) ; Hook. f. Fl. Brit. India, ii. 63 (1876) ; Engl. & Prantl, Pflanzenfam. iii. III. 222 (1893) ; Trimen, Fl. Ceylon, ii. 7 (1894) ; Dalla Torre & Harms, Gen. Siphonog. 225 (1900) ; Baker in Ewart & Davies, Fl. N. Territ. 139 (1917) ; Gamble, Fl. Madras, Pt. ii. 279 (1918) ; Hutchinson & Dalziel, Fl. W. Trop. Afr. i. 394 (1928).—Species 2 from India, Trop. Africa and N. Australia.

Standard species : *R. trifoliata* (Roth) Pers. = *R. indica* (L.) Druce.

Rothia Schreb. Compositae.

Adopted by : Willd. Sp. Pl. iii. III. p. 1611 (1804) ; Spreng. Syst. iii. 633 (1826) ; Endl. Gen. 501 n. 3023, (1838). *Rothia* Schreb. is now, however, almost universally regarded as a synonym of *Andryala* L.

Rothia Lam. Compositae.

This name has been retained by O. Kuntze, Rev. Gen. iii. II. 169 (1898), but in almost all other works it is reduced to *Hymenopappus* L'Hérit. It is also a later homonym of *Rothia* Schreb. and thus is inherently illegitimate.

Rothia Borkh. Gramineae.

This name also being a later homonym is illegitimate. It is now considered by most botanists as a taxonomic synonym of *Mibora* Adans.

The earlier synonym *Dillwynia* Roth, Cat. Bot. iii. 71 (1806), is illegitimate as it is a later homonym of *Dillwynia* Sm. (1805).

There appears to be good reason for putting forward the generic name *Rothia* Pers. for conservation. It consists of two species, with wide distribution. A few of the early botanists changed the name to *Westonia* Spreng., the earliest valid name for the genus, e.g., Spreng. Syst. iii. 152, 230 (1826) ; Spach, Vég. Phan. i. 152 (1834) ; Endl. Gen. Pl. Suppl. I. n. 6475, p. 1427 (1841) ; Meissn. Comm. 350 (1843) ; Kuntze, Rev. Gen. i. 213 (1891) ; but as can be judged from the above references the name *Rothia* Pers. appears in most literature dealing with the flora of the area.

Rothia Pers. is recommended for conservation.

6843 *Roulinia* Decne. in DC. Prodr. viii. 516 (1844)

versus

Roulinia Brongn. in Ann. Sc. Nat. Sér. II. xiv. 320 (1840).

Roulinia Decne. Asclepiadaceae.

Adopted by : Benth. & Hook. f. Gen. Pl. ii. 762 (1862-7) ; Fourn. in Mart. Fl. Bras. vi. IV. 215 (1885) ; Engl. & Prantl, Pflanzenfam. iv. II. 255 (1895) ; Post & Kuntze, Lexic. 490 (1903) ; Dalla Torre & Harms, Gen. Siphonog. 415 (1904) ; Pulle, Enum. Pl. Surinam, 388 (1906) ; C. M. Hicken, Chloris Plat. Argent. 187 (1910) ; Malme in Arkiv Bot. Stockh. xvi. No. 15, 18 (1921) ; Rusby in Mem. N. Y. Bot. Gard. vii. 333 (1927) ; Seckt, Fl. Cordobensis, 395 (1929-30) ; Standley in Publ. Field Mus. Nat. Hist. Chicago, Bot. Ser. iii. 389 (1930).—From 15-22 species in Tropical America, from Texas to the Argentine.

Standard species : *R. corymbosa* DC., one of the eleven original species.

Roulinia Brongn. Liliaceae.

This name appears to have been adopted by very few botanists. Meissn. Gen. 396 (1842) places it in Bromeliaceae. It is now almost universally regarded as in part a synonym of *Nolina* Michx., and in part *Dasyllirion* Zucc.

Although *Roulinia* Decne. has been adopted for the Asclepiadaceous genus by so many botanists, it can scarcely be regarded as a name for conservation. Already there exists a legitimate name for the genus, viz. *Rouliniella* Vail in Bull. Torr. Bot. Cl. xxix. 662 (1902), and seven transferences from the genus *Roulinia* to *Rouliniella* have already been made by Vail. The changes in nomenclature, therefore, will not be very many if *Rouliniella* is adopted.

Hence the name *Roulinia* is not put forward for conservation.

3872 **Rudolphia** Willd. in Neue Schrift. Ges. Nat. Fr. Berlin, iii. 451 (1801)

versus

Rudolphia Medik. Malvenfam. iii. 111 (1787).

Rudolphia Willd. Leguminosae.

Adopted by: H.B.K. Nov. Gen. vi. 432 (1823); Spreng. Syst. iii. 244 (1826); G. Don, Gen. Syst. ii. 373 (1832); Endl. Gen. ii. 1295 (1841); Benth. & Hook. f. Gen. Pl. i. 532 (1865); Bello, Fl. Puerto Rico, 263 (1883); Engl. & Prantl, Pflanzenfam. iii. III. 364 (1894); Dalla Torre & Harms, Gen. Siphonog. 243 (1901); Urb. Symb. Antill. iv. 302 (1905).—Species probably 1 from Porto Rico.

Standard species: *R. volubilis* Willd., the type.

Rudolphia Medik. Malpighiaceae.

This genus appears to be universally regarded as a synonym of *Malpighia*.

Neorudolphia Britton in Sc. Surv. Porto Rico & Virgin Islands, v. III. 426 (1924).

Britton made this generic name in 1924 to replace *Rudolphia* Willd. It seems undesirable, therefore, to add *Rudolphia* to the list of nomina conservanda. It is regarded by most people as a monotypic genus and has only a restricted distribution.

Rudolphia Willd., therefore, is *not* put forward for conservation.

5060 **Rulingia** R. Br. in Bot. Mag. t. 2191 (1820)

versus

Ruelingia Ehrh. Beitr. iii. 132 (1788).

Rulingia Harv. Syn. 124 (1812).

Rulingia R. Br. Sterculiaceae.

Adopted by: Endl. Gen. 997, n. 5328 (1840); Walp. Rep. i. 337 (1842); Benth. & Hook. f. Gen. Pl. i. 226 (1862); Benth. Fl. Austral. i. 237 (1863); Engl. & Prantl, Pflanzenfam. iii. VI. 83 (1890); F. M. Bailey, Queensl. Fl. i. 146 (1899); Dalla Torre & Harms, Gen. Siphonog. 311 (1901); Palacky, Cat. Pl. Madag. Fasc. v. 30 (1907); Ewart and Davies, Fl. N. Territ. 190 (1917); Black, Fl. S. Austral. 383 (1926); Ewart, Fl. Vict. 762 (1930); Gardner, Enum. Pl. Austral. Occ. Pt. 3, 80 (1931).—About 17 species from Australia and Madagascar.

Standard species: *R. pannosa* R. Br., the type.

Ruelingia Ehrh. and *Rulingia* Haw. Portulacaceae.

These genera are almost universally sunk under the genus *Anacampseros* Sims, Portulacaceae. In the first contribution to this paper Prof. Rehder puts forward the conservation of *Anacampseros* Sims (1811) and the consequent rejection of *Ruelingia* Ehrh. (1788).

As far as can be traced the only botanist who definitely rejects *Rulingia* R. Br. in favour of another "earlier" synonym is O. Kuntze in Rev. Gen. i. 81 (1891), where he retains *Restaria* Rumph. Herb. Amb. (1743), he also included under *Restaria*, *Commersonia* as well as *Rulingia*.

As *Restaria* Rumph. 1743 is a pre-Linnean name, the name must be attributed to O. Kuntze 1891, and becomes a later homonym of *Restaria* Lour. (1790).

It appears advisable to put forward the name *Rulingia* R. Br. for conservation. It has been used in almost all floras dealing with the areas concerned, and if it is not conserved many nomenclatural changes will of necessity take place. There is a later synonym of *Rulingia* R. Br., namely, *Achilleopsis* Turcz. in Bull. Soc. Mosc. xxii. II. 9 (1849), and up to the present it contains only one species, *A. densiflora*. This name *Achilleopsis* Turcz. is quoted in synonymy in most of the Australian floras.

The name *Rulingia* R. Br. is recommended for conservation.

7306 **Saccocalyx** Coss. & Dur. in Ann. Sc. Nat. Sér. III. xx. 80 (1853)

versus

Saccocalyx Stev. in Bull. Soc. Nat. Mosc. iv. 269 (1832).

Saccocalyx Coss. & Dur. Labiatae.

Adopted by: Battandier & Trabut, Fl. Algérie, 678 (1890); Engl. & Prantl, Pflanzenfam. iv. IIIA. 303 (1896); Cosson, Ill. Fl. Atlant. ii. t. 158 (1897); Battandier & Trabut, Fl. Algér. et Tunis. 260 (1904); Dalla Torre & Harms, Gen. Siphonog. 443 (1904); Jahandiez & Maire, Cat. Pl. Maroc. iii. 649 (1934).—One species from Algeria.

Standard species: *S. satureioides* Coss. & Dur., the type.

Saccocalyx Stev. Leguminosae.

Steven divided the genus *Astragalus* into many genera, and assigned various species to each. To *Saccocalyx* he assigned nine, and stated that there would be an additional two new species. He did not make the transferences although such are assigned to him in the Index Kewensis. This paper of Steven's was reprinted apparently without alteration in Nouv. Mém. Mosc. iii. 107 (1834), which accounts for some authors such as Pfeiffer quoting 1834 as the date of the genus.

As far as can be ascertained this genus has not been kept up by any botanists since, and the genus as well as the species are all reduced to *Astragalus* in the Index Kewensis.

On the other hand, the genus *Saccocalyx* Coss. & Dur. is, as far as can be seen, retained by most authors. Those who do not retain it consider that it is a synonym of *Satureja*, cf. Benth. & Hook. f. Gen. Pl. ii. 1187 (1876), or of *Clinopodium*,

see Post & Kuntze, Lexic. 495 (1903). No other name has been given to the genus.

It seems desirable therefore, to conserve the name *Saccocalyx* Coss. & Dur., since the earlier name is very unlikely to be used in the future.

4452 *Sagotia* Baill. in Adansonia, i. 53 (1860-61)

versus

Sagotia Walp. in Linnaea, xxiii. 737 (1850).

Sagotia Baill. Euphorbiaceae.

Adopted by: Müll.-Arg. in Flora, xlvii. 516 (1864); Müll.-Arg. in DC. Prodr. xv. II. 1113 (1866); Mart. Fl. Bras. xi. II. 504 (1874); Benth. & Hook. f. Gen. Pl. iii. 302 (1880); Engl. & Prantl, Pflanzenfam. iii. V. 84 (1890); Dalla Torre & Harms, Gen. Siphonog. 279 (1901); Post & Kuntze, Lexic. 495 (1903); Pulle, Enum. Pl. Surinam, 261 (1906); Pax in Engl. Pflanzenreich, Euphorb.-Cluyt. 39 (1911); Pax & Hoffmann in Engl. Pflanzenfam. Aufl. 2, xixC. 160 (1931); Lanjouw in Pulle, Fl. Surinam, ii. 64 (1932).—One species from the Amazons and Guiana.

Standard species: *S. racemosa* Baill., the type.

Sagotia Duchass. & Walp. Leguminosae.

This genus was maintained by Walpers in Ann. Bot. ii. 412 (1851). From that date, however, it appears to have received only sectional rank, e.g. Bentham in Pl. Jungh. ii. 222 (1852) makes it a section of *Desmodium*; Miq. Ind. Bat. i. 238 (1855) also quotes it as a section of *Desmodium*; Müll.-Arg. in Ann. Bot. iv. 409 (1857) treats it in the same way but spells the name "*Lagotia*" by mistake.

Sagotia Duchass. & Walp. as far as can be traced, has not been treated as an independent genus since 1851, and then only by its author.

Sagotia Baill. has no synonyms and has been adopted by all workers since the time of its publication. If it is not conserved a new name will have to be found for the species *S. racemosa*. Therefore, in order to avoid nomenclatural change, and in view of the fact that *Sagotia* Duchass. & Walp. will probably never be regarded as an independent genus in the future, *Sagotia* Baill. (1860-1) is here put forward for conservation.

9208 *Salmea* DC. Cat. Hort. Monspel. 140 (1813)

versus

Salmia Cav. Icon. iii. 24, t. 246 (1794).

Salmia Willd. in Mag. Ges. Nat. Fr. Berlin, v. 399 (1811).

Salmea DC. Compositae.

Adopted by: R. Br. in Trans. Linn. Soc. xii. 112 (1817); Cass. Dict.

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xxxviii. p. 17 (1825); Lessing, Syn. 212 (1832); DC. Prodr. v. 493 (1836); Endl. Gen. 397, n. 2448 (1838); Endl. Ench. 237 (1841); Benth. & Hook. f. Gen. Pl. ii. 381 (1873); Hemsl. Biol. Centr. Amer. ii. 194 (1881-2); Engl. & Prantl, Pflanzenfam. iv. V. 237 (1890); Dalla Torre & Harms, Gen. Siphonog. 549 (1905); Blake in Journ. Bot. liii. 193 (1915); Britton & Millsp. Baham. Fl. 452 (1920); Urb. Symb. Antill. viii. 734 (1921); Britton & P. Wilson, Sc. Surv. Porto Rico & Virgin Islands, vi. II. 310 (1925); Standley, (Fl. Panama Canal Zone) in Contrib. U.S. Nat. Herb. xxvii. 382 (1928).—About 15 species from Mexico and West Indies.

Standard species: *S. scandens* (L.) DC., the best known of the original species.

Salmia Cav. Liliaceae.

No botanists appear to have retained this as an independent genus. It is generally treated as a synonym of *Sansevieria* Thunb., which is a nomen conservandum, see Dalla Torre & Harms, Gen. Siphonog. 79 (1900) and Pax in Engl. Pflanzenfam. Aufl. 2, xva. 360 (1930).

Salmia Willd. Cyclanthaceae.

This name has been adopted by very few botanists, such as Sprengel, Anleit. ii. I. 124 (1817); Gen. ii. 682, n. 3440 (1831) and Roem. & Schult. Syst. iii. pp. 35, 496 (1818). It is now, however, almost universally regarded as a synonym of *Carludovica* Ruiz & Pav., see Dalla Torre & Harms, Gen. Siphonog. 44 (1900); Post & Kuntze, Lexic. 496 (1903).

In 1819 Sprengel (Nov. Prov. 23 (1819), Syst. iii. 443: 1826) renamed the genus *Salmea* DC., and called it *Hopkirkia* because of the previous *Salmia* Cav. and *Salmia* Willd. This name, however, appears to have been adopted by no one else.

Another later synonym is *Fornicaria* Rafin. Sylva Tellur. 116 (1838), which also appears to have been accepted by no one.

In order to avoid many nomenclatural changes the name *Salmea* DC. is without hesitation put forward for conservation. A word may be said as to the spelling of the name. The original spelling of De Candolle was *Salmea* and therefore that is retained here. De Candolle used it twice, first in Cat. Hort. Monsp. (1813) and again in the Prodr. (1825), hence it was his deliberate choice, and must not be changed by subsequent authors.

4277 *Salomonina* Lour. Fl. Cochinch. 14 (1790)

versus

Salomonina Heist. ex Fabricius, Enum. Pl. Hort. Helmst. ed. 2, 38 (1763).

Salomonina Lour. Polygalaceae.

Adopted by: Vahl, Enum. i. 8 (1805)—Vahl "corrected" the name to "*Salmonia*"; St. Hil. Expos. i. 227 (1805); Hedw.

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Gen. p. 5, 344 (1806); Roem. & Schult. Syst. i. 5, 37 (1817); DC. Prodr. i. 333 (1824); Spreng. Syst. i. 17 (1825); Reichb. Consp. 120 (1828); G. Don, Gen. Syst. i. 362 (1831); Endl. Gen. ii. 1077 (1840); Benth. & Hook. f. Gen. Pl. i. 136 (1862); Benth. Fl. Austral. i. 138 (1863); Hook. f. Fl. Brit. Ind. i. 206 (1872); Trimen, Handb. Fl. Ceylon, i. 83 (1893); Engl. & Prantl, Pflanzenfam. iii. IV. 342 (1896); F. M. Bailey, Queensl. Fl. i. 77 (1899); Dalla Torre & Harms, Gen. Siphonog. 267 (1901); Lévillé in Bull. Soc. Bot. France, li. 290 (1904); F. M. Bailey, Comp. Cat. Queensl. Pl. 43 (1913); Gamble, Fl. Madras, Pt. i, 56 (1915); Ewart & Davies, Fl. N. Territ. 161 (1917); Ridley, Fl. Malay Penins. i. 139 (1922); Merrill, Enum. Philipp. Fl. Pl. ii. 385 (1922).—About eight species from tropical and eastern Asia and Australia.

Standard species: *S. cantoniensis* Lour., the original species.

Salomonina Heist. ex Fabricius. Liliaceae (Convallariaceae).

Adopted by: Britton, Man. Fl. N.U.S. ed. 3, 273 (1907); Wootton & Standley in Contrib. U.S. Nat. Herb. xvi. 113 (1913).—About 3 species. With the exception of certain North American botanists who have retained the name *Salomonina* Heist., almost all others have regarded the genus as synonymous with *Polygonatum*, and consequently have used the name *Salomonina* when referring to Loureiro's genus of *Polygalaceae*. In the Index Kewensis, *Salomonina* Heist. = *Polygonatum*; the same reduction is also made by Dalla Torre & Harms, Gen. Siphonog. p. 71, and Post & Kuntze, Lexic. p. 496 (1903).

In view of the very large preponderance of usage in favour of *Salomonina* Lour., this name is put forward without hesitation for conservation. It is a very well established name as can be seen from the representative list of floras cited above.

9457 *Saussurea* DC. in Ann. Mus. Paris, xvi. 156, 196 (1810)
versus

Saussurea Salisb. in Trans. Linn. Soc. viii. 11 (1807), in obs.
Saussuria Moench, Meth. 388 (1794).

Saussurea DC. Compositae.

Adopted by: DC. Fl. France, v. 466 (1815); Spreng. Syst. iii. 380 (1826); Reichb. Consp. 101 (1828); Lessing, Syn. 11 (1832); DC. Prodr. vi. 531 (1837); Endl. Gen. i. 468 (1838); Torr. & Gray, N. Am. Fl. ii. 452 (1843); Walp. Rep. ii. 668 (1843); Ledeb. Fl. Ross. ii. 660 (1846); Benth. & Hook. f. Gen. Pl. ii. 471 (1873); Boiss. Fl. Or. iii. 565 (1875); Hook. f. Fl. Brit. Ind. iii. 365 (1881); Forbes & Hemsl. in Journ. Linn. Soc. xxiii. 463 (1888); Engl. & Prantl, Pflanzenfam. iv. V. 320 (1892); Coste, Fl. France, ii. 401 (1903); Krailov, Fl. Altaya, 698 (1904); Rouy, Fl. France, ix. 98 (1905); Dalla Torre & Harms, Gen. Siphonog. 568 (1906); Matsumura, Ind. Pl. Jap.

661 (1912); Fedtschenko, Rastit. Turkest. 750 (1915); Maevskii, Fl. Centr. Russ. 279, 322 (1917); Lindman, Svensk Fanerog. Fl. 547 (1918); Diels in Fedde, Repert. Beih. xii. 511 (1922); Schinz & Thellung, Fl. Schweiz. Aufl. 4, Teil 1, 701 (1923); Fitch & Sm. Ill. Brit. Fl. ed. rev. 5, t. 557 (1924); Benth. Handb. Brit. Fl. ed. 7 (Rendle) 258 (1924); Hand.-Mazz. in Anz. Akad. Wiss. Wien, Math.-Nat. 1925, lxii. 15; Komarov & Klob.-Alis. Key for Plants Far East. Reg. of U.S.S.R. ii. 1005, 1063 (1932).—Probably over 200 species from North Temperate regions, Himalaya and Australia.

Standard species: *S. alpina* DC., the best known of the original species.

Saussurea Salisb. Liliaceae.

This name has been retained by Post & Kuntze, Lexic. 502 (1903). It is, however, a name that must be rejected, as the generic name *Hosta* (1812) is conserved against it.

Saussuria Moench. Labiatae.

This genus contains one species, *S. pinnatifida*, which was based on *Nepeta multifida* L. All botanists regard it as synonymous with *Nepeta* L.

O. Kuntze in his Rev. Gen. 367-8 (1891) transferred all the species of *Saussurea* DC. then known to the genus *Theodorea* Cass. in Dict. Sc. Nat. xlvii. (1827). As far as can be ascertained, however, no botanists since have followed his example.

The generic name *Saussurea* DC. is very well known, and is used almost universally. It is very strongly recommended for conservation.

5964 *Scaligeria* DC. Mém. v. 70 (1829)

versus

Scaligera Adans. Fam. ii. 323 (1763).

Scaligeria DC. Umbelliferae.

Adopted by: DC. Prodr. iv. 248 (1830); G. Don, Gen. Syst. iii. 381 (1834); Endl. Gen. i. 792 (1839); Boiss. Fl. Or. ii. 875 (1872); Post, Fl. Syria, Palest. & Sinai, 350 (1896); Engl. & Prantl, Pflanzenfam. iii. VIII. 165 (1898); Dalla Torre & Harms, Gen. Siphonog. 368 (1903); Dinsmore, Pfl. Paläst. 43 (1911); Fedtschenko, Rastit. Turkest. 603 (1915); Korovin in Not. Syst. Herb. Hort. Petrop. v. 79 (1924); Korovin in Bull. Univ. As. Centr. xiv. Suppl. 8, 19 (1926); H. Wolff in Fedde, Repert. xxvii. 126 (1929); Post, Fl. Syria, Palest. & Sinai, ed. Dinsmore, i. 521 (1932).—About 10 species from Western Asia.

Standard species: *S. microcarpa* DC., the original species.

Scaligera Adans. Leguminosae.

The only species included under this name in the Index Kewensis is *S. orientalis* Rafin. Sylva Tellur. 69, and it is there reduced to *Aspalathus*. Dalla Torre & Harms, Gen. Siphonog.

225, also reduce the genus to *Aspalathus*, and Post & Kuntze, Lexic. 503 (1903) reduce it to *Achyronia* L. (1742), which genus Dalla Torre & Harms, l.c. also reduce to *Aspalathus*. No botanists except Rafinesque appear to have retained the genus *Scaligeria* Adans., and it seems very unlikely that the name will ever be revived.

The generic name *Scaligeria* DC., therefore, is put forward for conservation in order to prevent changes in nomenclature.

962 *Schelhammera* R. Br. Prodr. 273 (1810)

versus

Schelhammera Moench, Meth., Suppl. 119 (1802).

Schelhammera R. Br. Liliaceae.

Adopted by: Hook. in Curtis, Bot. Mag. t. 2712 (1827); Reichb. Consp. 65 (1828); Endl. Gen. i. 136 (1837); Kunth, Enum. iv. 210 (1843); Benth. Fl. Austral. vii. 31 (1878); Benth. & Hook. f. Gen. Pl. iii. 829 (1883); C. Moore, Census Pl. N.S.W. 72 (1884); F. M. Bailey, Syn. Queensl. Fl. 547 (1888); Engl. & Prantl, Pflanzenfam. ii. V. 26 (1888); C. Moore & Betche, Handb. Fl. N.S.W. 419 (1893); Dalla Torre & Harms, Gen. Siphonog. 61 (1900); F. M. Bailey, Queensl. Fl. Part V. 1642 (1902); W. A. Dixon, Pl. N.S.W. 272 (1906); F. M. Bailey, Compr. Cat. Queensl. Pl. 559 (1913); Sulman, Pop. Guide Wild Fl. N.S.W. 185 (1913); Maiden & Betche, Census N.S.W. Pl. 40 (1916); Krause in Engl. & Prantl, Pflanzenfam. Aufl. 2, xva, 266 (1930); Ewart, Fl. Victoria, 286 (1930); Hutchinson, Fam. Fl. Pl. ii. 96 (1934).—Species 2–3 from Australia.

Standard species: *S. undulata* R. Br., the type.

Schelhammera Moench. Cyperaceae.

This genus has been adopted by Du Mortier, Fl. Belg. 145 (1827) and by Reichb. Fl. Germ. Excurs. 72 (1830–2). Since that date, however, it appears to have been universally regarded as a synonym of *Carex*. It seems very unlikely that the name will again be revived as an independent genus.

For *Schelhammera* R. Br. there is a later synonym, namely, *Parduyna* Salisb. Gen. Pl. 58, 59 (1866); the genus is here described by Salisbury but he does not make any transfers (specific) under this name, although *P. multiflora* is credited to him in the Index Kewensis.

Mention ought perhaps to be made of *Schelhammera* Heist. Syst. 9 (1749), but as this is a pre-Linnean name it need not be taken into account for the purposes of this paper.

As *Schelhammera* R. Br. is so widely used, and to save any changes in nomenclature, the name is suggested for conservation.

8215 *Schizocalyx* Wedd. in Ann. Sc. Nat. Sér. IV. i. 73 (1854)
versus

Schizocalyx Scheele in Flora, xxvi. 575 (1843).

Schizocalyx Hochst. in Flora, xxvii. Beil. 1 (1844).

Schizocalyx Wedd. Rubiaceae.

Adopted by: Walp. Ann. Bot. v. 120 (1858); Benth. & Hook. f. Gen. Pl. ii. 39 (1873); Engl. & Prantl, Pflanzenfam. iv. IV. 53 (1891); Post & Kuntze, Lexic. 505 (1903); Dalla Torre & Harms, Gen. Siphonog. 494 (1905); Standley in Publ. Field Mus. Nat. Hist. Chicago, (Rubiaceae of Colombia) vii. No. 1, 21 (1930).—2 species from Colombia.

Standard species: *S. bracteosa* Wedd., the type.

Schizocalyx Scheele. Labiatae.

This name appears to have been sunk by all botanists, either as a synonym of *Majorana* (Dalla Torre & Harms, Gen. Siphonog. p. 444) or as a synonym of *Origanum* (Post & Kuntze, Lexic. 505). There seems no likelihood of its being revived.

Schizocalyx Hochst. Salvadoraceae.

This name is a later homonym of *Schizocalyx* Scheele and therefore is illegitimate. It has been accepted by Walp. Rep. v. 375 (1846) and Roem. Fam. Nat. i. 89, 125 (1846). Apart from these it seems universally regarded as a synonym of *Dobera*.

Mention ought perhaps to be made of *Schizocalyx* Berg. in Linnaea, xxvii. 319 (? 1855).

The date on the title page of Linnaea, xxvii. is 1854, but this appears to be erroneous. Flora, 1857, 285 announces Linnaea, Band xxvii. Heft. 1–6 (1855), whereas in Bot. Zeit. 1857, p. 27, the year of publication is given as 1856.

It is therefore unnecessary to place *Schizocalyx* Berg. on the list of nomina rejicienda.

Although *Schizocalyx* Wedd. is a small genus consisting at present of only 2 species, and the distribution is confined to Colombia, it seems advisable to put the name forward for conservation. If it is not conserved a new name must be found for the genus.

6788 *Schizonotus* A. Gray in Proc. Amer. Acad. xii. 66 (1876)

versus

Schizonotus Lindl. in Wall. Numer. List, n. 703 (1829)=*Sorbaria* nomen conservandum.

Schizonotus Rafin. New Fl. iii. 75 (1836)=*Holodiscus*, nomen conservandum.

Schizonotus A. Gray. Asclepiadaceae.

Adopted by: Watson, Gray & Brewer, Bot. Calif. ii. 463 (1880); Engl. & Prantl, Pflanzenfam. iv. II. 237 (1895); Dalla Torre & Harms, Gen. Siphonog. 413 (1904).—One species from California.

Standard species: *S. purpurascens* Gray, the type.

The name *Schizonotus* A. Gray is *not* put forward for conservation, as it is considered in no way necessary. Because there already existed *Schizonotus* Lindl., Greene in Pittonia ii. 67 (1890) changed the name of this Asclepiadaceous genus to *Solanoa* and made the new combination *Solanoa purpurascens* (Gray) Greene. He has been followed by Jepson, in his Man. Fl. Pl. Calif. 771 (1925), as well as in Jepson's earlier floras of the district. It is therefore undesirable to conserve *Schizonotus* A. Gray.

For a detailed account of these genera see Sprague in Journ. Bot. 1921, 249.

9291 **Schkuhria** Roth, Cat. Bot. i. 116 (1797)

versus

Schkuhria Moench, Meth. 566 (1794).

Schkuhria Roth. Compositae.

Adopted by: Willd. Sp. Pl. iii. 2130 (1804); Spreng. Anl. ii. II. 564 (1818); H.B.K. Gen. Nov. iv. 261 (1820); Link, Enum. ii. 339 (1822); Kunth, Syn. ii. 495 (1823); Reichb. Consp. 109 (1828); Lessing, Syn. 239 (1832); DC. Prodr. v. 654 (1836); Endl. Gen. 421 (1838); Walp. Rep. ii. 625 (1843); Benth. & Hook. f. Gen. Pl. ii. 403 (1873); Engl. & Prantl, Pflanzenfam. iv. V. 260 (1890); Robinson & Seaton in Proc. Amer. Acad. xxviii. 109 (1893); Reiche, Fl. Chile, iv. 114 (1905); R. E. Fries in Archiv Bot. Stockh. v. No. 13, 22 (1906); Hicken, Chloris Platensis Argent. 258 (1910); Thellung in Fedde, Repert. xi. 308 (1912); Wootton & Standley in Contrib. U.S. Nat. Herb. xix. 720 (1915); Gandoger in Bull. Soc. Bot. France, 1918, lxx. 46; Lemée, Dict. Pl. Phan. v. 1039 (1934).—About 12–14 species from Western America (Mexico to Argentine).

Standard species: *S. abrotanoides* Roth, the type.

Schkuhria Moench. Compositae.

This name appears to have been adopted by no botanists. It was based by Moench on *Sigesbeckia flosculosa* L'Hérit., and is now almost universally regarded as a synonym of *Sigesbeckia*. See Dalla Torre & Harms, Gen. Siphonog. 547, and Post & Kuntze, Lexic. 506 (1903).

The genus *Schkuhria* Roth (1797) was reduced by Post and Kuntze to *Hymenopappus* L'Hérit. Rydberg in N. Amer. Fl. xxxiv. 44 (1914) adopted the name *Tetracarpum* Moench (1802) for the genus on account of the earlier *Schkuhria* Moench (1794). As can be seen from the above references, by far the greater majority of botanists have retained the name *Schkuhria* Roth, which is here recommended for conservation.

9511 **Schlechtendalia** Less. in Linnaea, v. 242 (1830)
versus

Schlechtendalia Spreng. Syst. Cur. Post. iv. 295 (1827).

Schlechtendalia Willd. Sp. Pl. iii. III. 2125 (1804).

Schlechtendalia Less. Compositae.

Adopted by: Less. Syn. 93 (1832); Endl. Gen. i. 481 (1838); DC. Prodr. vii. 2 (1838); Meissn. Gen. 228 (1839); Endl. Ench. 247 (1841); Spach, Vég. Phan. x. 9 (1841); Reichb. Nom. 97 (1841); Gibert, Enum. Pl. Montevid. 18 (1873); Benth. & Hook. f. Gen. Pl. ii. 484 (1873); Griseb. Symb. Argent. 209 (1879); Baill. Hist. Pl. viii. 104 (1882); Baker in Mart. Fl. Bras. vi. III. 342 (1884); Engl. & Prantl, Pflanzenfam. iv. V. 342 (1893); Arechavaleta, Fl. Urug. iii. (An. Mus. Nac. Montevideo, vi.) 417 (1908); Beauverd in Bull. Soc. Bot. Genève, Sér. II. v. 242 (1913); Lemée, Dict. Pl. Phan. v. 1040 (1934).—One species from Uruguay and Brazil.

Standard species: *S. luzulifolia* Less., the type.

Schlechtendalia Spreng. Tiliaceae.

This genus was retained in Spreng. Gen. ii. 601 (1831). Apart from this it appears to be universally recognized as a synonym of *Mollia* Mart. & Zucc. (1824).

Schlechtendalia Willd. Compositae.

This name has priority over the above two later homonyms. It has been retained by Spreng. Anl. ii. II. 563 (1818); Dict. Sc. Nat. xlix. p. 62 (1829); O. Kuntze, Rev. Gen. 361 (1891). Kuntze when he retained *Schlechtendalia* Willd. made a new name for *Schlechtendalia* Less., namely, *Chamissomneia* O. Kuntze, but as far as can be ascertained no botanists have adopted this name.

The genus *Schlechtendalia* Willd. has only one species and by far the greater majority of botanists regard it as synonymous with *Dysodia* Cav.

Although the case for conserving the name *Schlechtendalia* Less. is by no means a strong one, the fact that it seems almost always used in floras dealing with Uruguay and Brazil leads to its being put forward for conservation.

312 **Schmidtia** Steud. in J. A. Schmidt, Beitr. Fl. Cap-Verd. Ins. 144 (1852)

versus

Schmidtia Moench, Meth., Suppl. 217 (1802).

Schmidtia Tratt. Fl. Oesterr. Kaiserth. i. 12, t. 10 (1816).

Schmidtia Steud. Gramineae.

Adopted by: Steud. Syn. Pl. Gram. 199 (1854); Benth. & Hook. f. Gen. Pl. iii. 1175 (1880); Ficalho & Hiern in Trans. Linn. Soc. Ser. II. ii. 31 (1881); Engl. & Prantl, Pflanzenfam.

ii. II. 64 (1887); Durand & Schinz, *Consp. Fl. Afr.* 871 (1894); Hackel, *The True Grasses*, 145 (1896); Dyer, *Fl. Cap.* vii. 657 (1900); Chiovenda in *Ann. Ist. Bot., Roma*, viii. 360 (1908); Engl. & Drude, *Veg. der Erde*, ix. II. 180 (1908); Thonner, *Blütenpfl. Afr.* 106 (1908); Pilger in *Engl. Jahrb.* xliii. 386 (1909); Pilger in *Notizbl. Bot. Gart. Berlin*, v. 150 (1910); Eyles in *Trans. Soc. S. Afr.* v. IV. 307 (1916); Prain, *Fl. Trop. Afr.* ix. I. 22 (1917); Stent in *Bothalia*, i. 293 (1924); Garabedian in *Ann. S. Afr. Mus.* xvi. 425 (1925); Massey, *Sudan Grasses*, 50 (1926); Phillips, *Gen. S. Afr. Fl. Pl.* 99 (1926); Bews, *World's Grasses*, 52 (1929); Stent & Rattray, *Grasses of S. Rhodesia* (*Proc. Rhod. Sc. Assoc.* xxxii.) 63 (1933); Hutchinson, *Fam. Fl. Pl.* ii. 208 (1934); Lemée, *Dict. Pl. Phan.* v. 1046 (1934).—Four species from Tropical and South Africa, Egypt and Cape Verde Islands.

Standard species: *S. pappophoroides* Steud., the type.

Schmidtia Moench. Compositae.

Although this genus has been kept up by Reichb. in *Flora*, xiii. 131 (1830) and Sch.-Bip. ex Hochst. in *Flora*, xxix. I. Intell. 27 (1841), it is almost always regarded as a synonym of *Tolpis* Adans., and it does not seem likely that it will be again revived.

Schmidtia Tratt. Gramineae.

This name is included in the list of nomina rejicienda in favour of *Coleanthus* Seidl. (1817).

A later synonym of *Schmidtia* Steud. is the generic name *Antoschmidtia* Steud. *Syn. Pl. Gram.* 199 (1855), but this was made "in synonymy" under *Schmidtia* Steud. Steudel himself did not recognize it as an independent genus. *Antoschmidtia*, however, has been kept up by Boiss. *Fl. Or.* v. 559 (1884) and by Rendle, *Cat. Pl. Welw.* ii. I. 230 (1899); Bremekamp & Obermeyer in *Ann. Transvaal Mus.* xvi. 405 (1935), where they make two new transferences.

In view, however, of the very extensive use in floras, etc. of *Schmidtia* Steud., it is here proposed for conservation. The genus has also some economic value as a fodder grass in the Kalahari District.

1618 *Schomburgkia* Lindl. *Sert. Orch.* t. 10 (1838)

versus

Schomburgkia DC. *Prodr.* vii. 293 (1838) = *Geissopappus*.

At first it may appear a little difficult to know which of these two names is the later homonym. On the plate in *Sert. Orch.* the date is given as April 1st, 1838. There is no exact date given in DC. *Prodromus*, but in Hook. *Journal of Botany*, ii. 44 (1840), Hooker writes: "A short time before the publication of the seventh volume of the *Prodromus*, a fine Orchidaceous genus was dedicated to Mr. Schomburgk by Lindley in the

second part of his *Sertum Orchidaceum*. It has, therefore, become necessary to change De Candolle's name for the present plant, and I have derived that of *Geissopappus* from the overlapping paleae of the pappus."

This, therefore, is proof that *Schomburgkia* Lindl. antedated *Schomburgkia* DC., and the name, accordingly, need not be conserved.

2940 *Schouwia* DC. *Syst.* ii. 643 (1821)

versus

Schouwia Schrad. *Gött. Gel. Anz.* 717 (1821).

Synonymum prius rejiciendum:

Subularia Forsk. *Fl. Aegypt. Arab.* 117 (1775).

Schouwia DC. Cruciferae.

Adopted by: DC. in *Mém. Mus. Paris*, vii. 244 (1821); DC. *Prodr.* i. 224 (1824); Reichb. *Consp.* 183 (1828); G. Don, *Gen. Syst.* i. 255 (1831); Meissn. *Gen.* 15 (1837); Endl. *Gen.* ii. 885 (1839); Jaub. & Spach, *Illustr.* iii. 144 (1847-50); Benth. & Hook. *f. Gen. Pl.* i. 89 (1862); Boiss. *Fl. Or.* i. 398 (1867); Rohlf, *Exped. Libysch. Wüste*, t. 11, p. 315 (1875); Cosson, *Comp. Fl. Atlant.* ii. 283 (1883-7); Engl. & Prantl, *Pflanzenfam.* iii. II. 174 (1891); Schweinf. in *Bull. Herb. Boiss.* iv. App. ii. 183 (1896); Dalla Torre & Harms, *Gen. Siphonog.* 185 (1901); Post & Kuntze, *Lexic.* 507 (1903); Muschler, *Man. Fl. Egypt*, i. 418 (1912); Ramis, *Bestimmungst. Fl. Aegypt.* 93 (1929); Post, *Fl. Syria, Palest. & Sinai*, Ed. 2 (Dinsmore), i. 125 (1932); Lemée, *Dict. Pl. Phan.* v. 1054 (1934).—Two species from Arabia and N. Africa.

Standard species: *S. arabica* DC., the type = *S. purpurea* (Forsk.) Schweinf.

De Candolle based his genus on *Subularia purpurea* Forsk. and, therefore, should have adopted the earliest specific epithet, namely *purpurea*.

Schouwia Schrad. Malvaceae.

It is difficult to ascertain the exact date of publication either of *Schouwia* DC. or of *Schouwia* Schrad. In the case of the latter it is clear that it was read on May 5th, 1821, and thus we may take it that publication was after that date. In the absence of definite proof it is considered advisable to put forward the case for the conservation of *Schouwia* DC. against *Schouwia* Schrad.

Schouwia Schrad. appears to be retained by no botanists. It is now universally sunk in *Goethea* Nees & Mart. There was only one species, namely *S. semiserrata* Schrad., which is *Goethea sempervirens*.

There are two synonyms of *Schouwia* DC. (1) *Subularia* Forsk. (1775) which is a name that must be rejected because it is a later homonym of *Subularia* L. 1753; (2) *Cyclopterygium* Hochst. in *Flora*, xxxi. 175 (1848).

If the generic name *Schowwia* DC. is not conserved, then Hochstetter's name stands, and the two species have already been transferred by Hochst., l.c. However, as no other botanists appear to have adopted *Cyclopterygium*, and in almost all floras *Schowwia* DC. is retained, it is here put forward for conservation.

6422 **Schrebera** Roxb. Pl. Coromand. ii. 1, t. 101 (1798)

versus

Schrebera L. Sp. Pl. ed. 2, 1662 (1763).

Schrebera Retz. Obs. Bot. vi. 25, t. 3 (1791).

Schrebera Thunb. Prodr. Pl. Cap. 28, t. 2 (1794).

Schrebera Roxb. Oleaceae.

Adopted by: Pers. Syn. i. 7 (1805); Roem. & Schult. Syst. i. 52, 76 (1817); Roxb. Fl. Ind., ed. Wall. i. 109 (1820); Spreng. Syst. i. 38 (1825); G. Don, Gen. Syst. iv. 231 (1837); Endl. Gen. 714 (1839); DC. Prodr. viii. 674 (1844); Welw. in Trans. Linn. Soc. xxvii. 38 (1869); Kurz in Flora, iv. 399 (1872); Brandis, Forest Fl. 305 (1874); Benth. & Hook. f. Gen. Pl. ii. 675 (1876); Hook. f. Fl. Brit. Ind. iii. 604 (1882); Baker in Kew Bull. 95 (1895); Gilg in Engl. Jahrb. xxx. 69 (1901); Baker in Dyer, Fl. Trop. Afr. iv. I. 13 (1902); Dalla Torre and Harms, Gen. Siphonog. 397 (1903); Cooke, Fl. Bombay, ii. 116 (1904); Brandis, Indian Trees, 444 (1906); Thonner, Blütenpfl. Afr. 453 (1908); Chev. in Bull. Soc. Bot. France, 1911, lviii. Mém. viii. 180 (1912); Fiori, Boschi Pianta Legn. Eritrea, 297 (1912); Lingelsheim in Engl. Pflanzenreich, Oleac. 95 (1920); Gamble, Man. Indian Timbers, 469 (1922); Gamble, Fl. Madras, Pt. v. 792 (1923); Phillips, Gen. S. Afr. Fl. Pl. 472 (1926); Hutch. & Dalz. Fl. W. Trop. Afr. ii. I. 26 (1930); Lemée, Dict. Pl. Phan. v. 1057 (1934).—Species up to about 26 from Africa, India and S. America.

Standard species: *S. swietenoides* Roxb., the original species.

Schrebera L. Convolvulaceae.

Concerning this generic name Roxburgh, Pl. Coromand. ii. 1 (1798), writes, "*Schrebera schinoides* of Linnaeus is a species of *Cuscuta*, growing on *Myrica aethiopica*." It is given in the International Rules of Botanical Nomencl. Art. 64, as a nomen confusum. "A name of a taxonomic group must be rejected if the characters of that group were derived from two or more entirely discordant elements, especially if those elements were erroneously supposed to form part of the same individual, e.g. the characters of the genus *Schrebera* L. (Sp. Pl. ed. 2, 1662: 1763; Gen. Pl. ed. 6, 124: 1764) were derived from the two genera *Cuscuta* and *Myrica* (parasite and host), see Retz. (Obs. vi. 15: 1791)."

This generic name therefore, must be rejected.

Schrebera Retz. Celastraceae.

This generic name has been retained by Willd. Sp. Pl. i. 1092 (1798), and apparently by very few other botanists. In the Index Kewensis the genus contains only one species, the original described by Retz, namely, *S. albens*. It is now universally regarded as a synonym of *Elaeodendron* Jacq. (1787).

Schrebera Thunb. Prodr. Pl. Cap. 28, t. 2 (1794); Fl. Cap. i. 519 (1818). Celastraceae.

Thunberg bases his generic name on *Hartogia capensis* L. Syst. 165, and quotes also as a synonym *Schrebera schinoides* Act. ups. Nov. i. 91, t. 5, f. 1 (1773).

This genus is now regarded by all botanists as a synonym of *Hartogia* L.f.

If the generic name *Schrebera* Roxb. is not conserved, the correct name for the genus will be *Nathusia* Hochst. in Flora, xxiv. II. 671 (1841). This name for the genus has been retained by Kuntze, Rev. Gen. i. 412 (1891) and by Knoblauch in Engl. & Prantl, Pflanzenfam. iv. II. 7 (1892). Most other botanists, as can be seen from the above citations, have adopted the name *Schrebera* Roxb. and in order to avoid many nomenclatural changes and to conform to present usage, the generic name *Schrebera* Roxb. is here put forward without hesitation for conservation.

6772 **Schubertia** Mart. & Zucc. Nov. Gen. & Spec. i. 55, t. 33 (1824)

versus

Schubertia Mirbel in Nouv. Bull. Soc. Philom. iii. 123 (1812).

Schubertia Mart. & Zucc. Asclepiadaceae.

Adopted by: G. Don, Gen. Syst. iv. 148 (1837); Lindl. Bot. Reg. xxiv. Misc. p. 2 (1838); Endl. Gen. 590, n. 3450 (1838); Meissn. Gen. 267 (1840); DC. Prodr. viii. 534 (1844); Fl. des Serres, Sér. I. ii. t. 169 (1846); Bot. Reg. xxxii. t. 21 (1846); Fourn. in Mart. Fl. Bras. vi. IV. 295 (1885); Journ. Hort. Ser. III. xv. 497 (1887); Gard. & Forest, iii. 368 (1890); Engl. & Prantl, Pflanzenfam. iv. II. 228 (1895); Journ. Hort. Ser. III. xxxi. 595 (1895); Malme in Svensk. Vet.-Akad. Handl. xxxiv. No. 7, 75 (1900); Gartenfl. l. t. 1492 (1901); Dalla Torre & Harms, Gen. Siphonog. 412 (1904); L. H. Bailey, Stand. Cycl. Hort. 3115 (1917); Handlist Tender Dicot. Roy. Bot. Gard. Kew, 179 (1931).—Species about six in Brazil and Colombia.

Standard species: *S. multiflora* Mart. & Zucc., the type.

Schubertia Mirbel. Pinaceae.

This genus has been retained by Spreng. Syst. iii. 890 (1826); Gen. ii. 700 (1831); Reichb. Consp. 80 (1828); Spach, Vég. Phan. xi. 347 (1842). At the present time however it is almost universally regarded as a synonym of *Taxodium* L. C. Rich. in

Ann. Mus. Paris, xvi. 298 (1910); cf. Pfeiffer, Nom. Bot. ii. II. 1091; Index Kewensis, p. 834; Dalla Torre & Harms, Gen. Siphonog. p. 3; and Post & Kuntze, Lexic. p. 508;

Mention should be made of *Schubertia* Blume, Bijdr. 884 (1826), Araliaceae.—Species two from Java.

This name, however, appears to be reduced either to *Horsfieldia* Bl. ex DC. Prodr. iv. 87 (1830), itself a later homonym of *Horsfieldia* Willd. (1806), or to *Harmsioplanax* Warb. (1897), see Dalla Torre & Harms, Gen. Siphonog. 364, no. 5885.

The genus *Schubertia* Mart. & Zucc. (1824) has not always been regarded as independent. This genus as well as *Physianthus* Mart. has been reduced by Bentham and Hooker f. Gen. Pl. ii. 751 (1876) under the older generic name *Araujia* Brot. in Trans. Linn. Soc. xii. 62 (1818). On the whole, however, it is usually regarded as an independent genus, and the name *Schubertia* Mart. & Zucc. is widely known among horticulturists. It is therefore considered advisable to put it forward for conservation.

6526 *Schultesia* Mart. Nov. Gen. & Spec. ii. 103, t. 180-2 (1827)
versus

Schultesia Spreng. Pugill. ii. 17 (1815).

Schultesia Schrad. in Gött. Gel. Anz. i. 708 (1821).

Schultesia Roth, Enum. Pl. Phanerog. Germ. i. 690 (1827).

Synonymum prius rejiciendum:

Floyeria, Neck. Elem. i. 388 (1790).

Schultesia Mart. Gentianaceae.

Adopted by: Mart. in Flora, x. I. 374 (1827); Reichb. Consp. 133 (1828); Chamisso in Linnaea, viii. 7 (1833); G. Don, Gen. Syst. iv. 196 (1837); Griseb. Gent. Gen. 126 (1839); Meissn. Gen. 260 (1839); Endl. Gen. 603 (1839); Spach, Vég. Phan. ix. 4 (1840); DC. Prodr. ix. 67 (1845); Griseb. in Linnaea, xxii. 34 (1849); Progel in Mart. Fl. Bras. vi. I. 203 (1865); Benth. & Hook. f. Gen. Pl. ii. 811 (1876); Baker in Kew Bull. 1894, 26; Engl. & Prantl, Pflanzenfam. iv. II. 96 (1895); Chodat in Bull. Herb. Boiss. Sér. II. iii. 549 (1903); Dalla Torre & Harms, Gen. Siphonog. 403 (1904); Malme in Arkiv Bot., Stockh. iii. No. 12, 9 (1904); Pulle, Enum. Pl. Surinam, 374 (1906); Robinson in Proc. Amer. Acad. xlv. 399 (1910); Urb. Symb. Antill. viii. 537 (1921); Brandegee in Univ. Calif. Publ. Bot. x. 413 (1924); Standley in Contrib. U.S. Nat. Herb. xxvii. 304 (1928); Lemée, Dict. Pl. Phan. v. 1058 (1934).—About 17 species from Tropical America mainly; also in Tropical Africa.

Standard species: *S. crenuliflora* Mart., one of the three original species and the one that agrees best with the original generic description.

Schultesia Spreng. Gramineae.

Apart from Sprengel himself, this genus was retained only by Jussieu, Dict. xlviii. 107 (1827). Most botanists however

regard it as a synonym of *Eustachys* (1810), see Pfeiffer, Nom. Bot. ii. II. 1092, or *Chloris* (1788), see Dalla Torre and Harms, Gen. Siphonog. 20. It is very unlikely that it will in future ever be regarded as an independent genus.

Schultesia Schrad. Amaranthaceae.

This appears to have been retained by no one. All botanists seem to regard it as synonymous with *Gomphrena*.

Schultesia Roth. Campanulaceae.

This genus appears to be almost universally regarded as synonymous with *Wahlenbergia*. It contains only one species, *S. hederacea* which is *Wahlenbergia hederacea*.

Floyeria Neck. Gentianaceae.

This is an earlier synonym of *Schultesia* Mart. As far as can be ascertained it has been retained only by Post and Kuntze, Lexic. 237 (1903) where they state (Typus: *Exacum guianense* Aubl. corollae "lobi subrotundi margine undati" ex Neck. est *Schultesia Aubletii* G. Don, nunc *Floyeria guianensis* O.K.).

No transferences other than *Floyeria guianensis* O.K. have been recorded.

In view of the fact that *Schultesia* Mart. is so very widely recognised as an independent genus and its occurrence in Tropical American floras so very frequent, it seems highly desirable that the generic name should be conserved against its earlier homonyms and against *Floyeria*. This conservation will save a large number of nomenclatural changes.

6058 *Schulzia* Spreng. Pl. Umbellif. Prodr. 30 (1813)
versus

Schultzia Rafin. in Med. Repos. N. York, v. 350 (1808).

Schulzia Spreng. Umbelliferae.

Adopted by: Spreng. Anleit. ii. II. 639 (1818); Spreng. Sp. Umbellif. 102 (1818); Roem. & Schult. Syst. vi. pp. xlv. 527 (1820); Dict. Sc. Nat. xlviii. 108 (1827); Reichb. Consp. 141 (1828); DC. Prodr. iv. 112 (1830); G. Don, Gen. Syst. iii. 286 (1834); Meissn. Gen. 142 (1838); Endl. Gen. 770, n. 4403 (1839); Spach, Vég. Phan. viii. 138 (1839); Ledeb. Fl. Ross. ii. 257 (1844); Walp. Rep. v. 850 (1846); Benth. & Hook. f. Gen. Pl. i. 909 (1862-67); C. B. Clarke in Hook. f. Fl. Brit. Ind. ii. 697 (1879); Engl. & Prantl, Pflanzenfam. iii. III. 207 (1898); Kruiilov, Fl. Altaya, ii. 499 (1903); Dalla Torre & Harms, Gen. Siphonog. 373 (1903); Fedtschenko, Rastit. Turkestan. 618 (1915); Gamble, Fl. Madras, 561 (1919); Lemée, Dict. Pl. Phan. v. 1059 (1934).—About 4 species in Central Asia and India.

Standard species: *S. crinita* (Pall.) Spreng., the type. Sprengel based his monotypic genus on *Sison crinita* Pall.

Schultzia Rafin. Gentianaceae.

No botanists appear to have retained this genus. It is almost universally regarded as a synonym of *Obolaria* L., cf. Pfeiffer, Nom. Bot. ii. II. 1092; Dalla Torre & Harms, Gen. Siphonog. 401; and Post & Kuntze, Lexic. p. 508.

Schultzia Nees in Nov. Act. Nat. Cur. xi. 63 (1823). Acanthaceae.

Although of later date than *Schulzia* Spreng. (1813) it is perhaps well to mention that this generic name is not now retained being regarded as a synonym of *Herpetacanthus* Nees (1847).

Although only a small genus, it seems advisable to conserve the generic name *Schulzia* Spreng. to avoid any change in nomenclature. If it is not conserved a new name will have to be given to the genus.

Mention must be made regarding the spelling of this generic name. In 1813 Sprengel named the genus after two men, namely J. H. Schulze and C. F. Schultze. Five years later in his Anleit. ii. II. 639 (1818) he cited the genus as *Schulzia* and the same year in his Spec. Umbellif. p. 102, he cited it as *Schultzia*. Subsequent authors have nearly all called the genus *Schultzia*. The correct spelling under the Rules is the original, namely *Schulzia*. Even though differing slightly in the spelling it may be regarded as a later homonym of *Schultzia* Rafin., and as such it is here put forward for conservation.

7878 *Seemannia* Regel in Gartenfl. iv. 183, t. 126 (1855)

versus

Seemannia Hook. Lond. Journ. Bot. vii. 567 (1848), nom. provis.

Seemannia Regel. Gesneriaceae.

Adopted by: Hanstein in Linnaea, xxix. 586 (1858); Benth. & Hook. f. Gen. Pl. ii. 1000 (1876); Baill. in Bull. Soc. Linn. Paris, i. 710 (1887); Baill. Hist. Pl. x. 82 (1891); Engl. & Prantl, Pflanzenfam. iv. IIIB. 176 (1894); Rusby in Mem. Torr. Bot. Cl. iv. 237 (1895), et l.c. vi. 96 (1896); Fritsch in Engl. Jahrb. xxix. Beibl. 65, pp. 12-13 (1900), et l.c. i. 403 (1913); Dalla Torre & Harms, Gen. Siphonog. 476 (1904); Fritsch in Meded. Herb. Leid. No. 29, 52 (1916).—About 6 species from Peru, Bolivia and Brazil.

Standard species: *S. sylvatica* (H.B.K.) Hanst. (*S. ternifolia* Regel), the original species.

Seemannia Hook. Rubiaceae.

As far as can be ascertained this name has not been kept up by any botanist except Kuntze (see Post & Kuntze, Lexic. 513: 1903). Most botanists regard it as synonymous with *Pentagonia* Benth.

The case for the conservation of *Seemannia* Regel is not a strong one. The genus is small, of no economic importance, and

of limited distribution. If, however, the name is not conserved, there would have to be made three new combinations, for already there exists a later valid name for the genus, namely *Fritschiantha* O. Kuntze, Rev. Gen. iii. II. 241 (1898), and the necessary specific transferences from *Seemannia* to *Fritschiantha* were also made by O. Kuntze. Thus those names published under *Seemannia* since 1898 would have to be transferred, namely *S. albescens* Fritsch, *S. longiflora* Fritsch, and *S. latifolia* Fritsch.

In order to avoid any nomenclatural change and to conform with modern usage, the generic name *Seemannia* Regel is here recommended for conservation.

9168 *Selloa* H.B.K. Nov. Gen. & Spec. iv. 265, t. 395 (1820)

versus

Selloa Spreng. Nov. Prov. Hort. Halens. & Berol. 36 (1819).

Selloa H.B.K. Compositae.

Adopted by: Link, Enum. Pl. Berol. ii. 340 (1822); Dict. Sc. Nat. xlviii. 356 (1827); Reichb. Consp. 110 (1828); Less. Syn. 231 (1832); DC. Prodr. v. 612 (1836); Endl. Gen. 415, n. 2549 (1838); Meissn. Gen. 199 (1839); Spach, Vég. Phan. x. 17 (1841); Benth. & Hook. f. Gen. Pl. ii. 361 (1873); Hemsl. Biol. Am. Centr. ii. 158 (1881); Engl. & Prantl, Pflanzenfam. iv. V. 231 (1890); Dalla Torre & Harms, Gen. Siphonog. 547 (1905).—One species from Mexico.

Standard species: *S. plantaginea* H.B.K., the type.

Selloa Spreng. Compositae.

This genus has been kept up by Spreng. Syst. iii. 358, 496, n. 2731 (1826); Spreng. Gen. ii. 621, n. 3085 (1831); Bot. Reg. vi. t. 462 (1820). It is also retained by Post & Kuntze, Lexic. p. 514 (1903). Apart from the above, most botanists reduce the genus to *Gymnosperma* Less. (1832), and therefore, unless *Selloa* Spreng. (1819) is placed on the list of nomina rejicienda, the name *Gymnosperma* cannot be used without conservation, the name *Selloa* Spreng. having priority.

Although *Selloa* H.B.K. is a monotypic genus and has very limited distribution, the name is strongly recommended for conservation. Otherwise the nomenclature of *Selloa* Spreng. and *Gymnosperma* Less. will need revision, and further nomenclatural changes will be involved as a new generic name will have to be given to *Selloa* H.B.K. It is true there is a later existing synonym of this latter name, namely *Feaea* Spreng. Syst. iii. 362 (1826), but *Feaea* Spreng. is in itself a later homonym of *Feea* Bory, Dict. Class. vi. 446 (1824), a genus of ferns, and must therefore be rejected.

In order, therefore, to avoid many nomenclatural changes, the generic name *Selloa* H.B.K. is here proposed for conservation.

5075 *Seringia* J. Gay in Mém. Mus. Paris, vii. 442, t. 16, 17 (1821)
versus
Seringia Spreng. Anleit. ed. 2, ii. 694 (1818).

Seringia J. Gay. Sterculiaceae.

Adopted by: H.B.K. Nov. Gen. & Sp. v. 312 (1821); DC. Prodr. i. 488 (1824); Reichb. Consp. 204, n. 5304 (1828); G. Don, Gen. Syst. i. 526 (1831); Spach, Vég. Phan. iii. 495 (1834); Meissn. Gen. 33 (1837); Endl. Gen. 996, n. 5322 (1840); Steetz in Lehm. Pl. Preiss. ii. 317, 349 (1847); F. Muell. Fragm. Phyt. Austral. i. 142 (1858-9); Benth. & Hook. f. Gen. Pl. i. 226 (1862); Benth. Fl. Austral. i. 244 (1863); Woolls, Pl. N. S. Wales, 24 (1885); Engl. & Prantl, Pflanzenfam. iii. VI. 91 (1890); F. M. Bailey, Queensl. Fl. i. 148 (1899); Dalla Torre & Harms, Gen. Siphonog. 312 (1901); Post & Kuntze, Lexic. 516 (1903) [*Seringea*].—One species from New Guinea and Australia.

Standard species: *Seringia platyphylla* J. Gay, the type, based on *Lasiopetalum arborescens* Ait., therefore correct name=*Seringia arborescens* (Ait.) Druce.

Seringia Spreng. Celastraceae.

This generic name appears to have been retained by no one except Sprengel himself who adopted it in his Syst. i. 441, n. 460 (1825) and in his Gen. i. 97 (1830). Sprengel based his genus on *Ptelidium ovatum* Thou. Nowadays the genus *Seringia* Spreng. is considered synonymous with *Ptelidium* Thou. (1805).

The generic name *Seringia* J. Gay has no great claim to conservation since the genus is not well known, and contains only one species with restricted distribution. There are two later synonyms, but unfortunately neither of these is available, both being later homonyms, namely, (1) *Gaya* Spreng. Syst. i. 535 (1825), a later homonym of *Gaya* H.B.K. Nov. Gen. & Sp. v. 266, t. 475, 476 (1821), Malvaceae; (2) *Actinostigma* Turcz. in Bull. Soc. Nat. Mosc. xxxii. Pt. 1, 259 (1859), a later homonym of *Actinostigma* Welw. in Annals Conselh. Ultramarino, 560 (1858), Hypericaceae.

If *Seringia* J. Gay is not conserved a new name will have to be given to this genus, and in order to avoid this the name is here put forward for conservation.

6275 *Shortia* Torr. & Gray in Am. Journ. Sc. Ser. I. xlii. 48 (1842), et l.c. Ser. II. xlv. 402 (1868)
versus

Shortia Rafin. Autikon Botanikon, 16 (1840); Pennell in Bull. Torr. Bot. Cl. xlviii. 92 (1921).

Shortia Torr. & Gray. Diapensiaceae.

Adopted by: Maxim. in Bull. Acad. Pétersb. xvi. 225 (1871); 488

Benth. & Hook. f. Gen. Pl. ii. 620 (1876); Gray, Syn. Fl. N. Amer. ed. 2, ii. I. 53 (1886); Drude in Engl. & Prantl, Pflanzenfam. iv. I. 83 (1889); Hook. f. in Bot. Mag. cxv. t. 7082 (1889); Chapman, Fl. S.U.S. ed. 3, 291 (1897); Dalla Torre & Harms, Gen. Siphonog. 386 (1903); Small, Fl. S.E.U.S. 898 (1913); L. H. Bailey, Stand. Cycl. Hort. vi. 3160 (1917).—Two species from North America and Japan.

Standard species: *S. galacifolia* Torr. & Gray, the type.

Shortia Rafin. Cruciferae.

A genus which has been overlooked by the majority of botanists, the description of which appeared in a rare work of Rafinesque. Pennell in Bull. Torr. Bot. Cl. 1921, xlviii. 92, has published a critical paper on these unrecorded genera. To quote his words: "*Shortia* Raf. (p. 16). Type species *Arabis dentata* 'Nutt.' actually (Torr.) T. & G., Fl. N. Amer. i. 80. 1838, of Kentucky. *Shortia dentata* (Torr.) Raf." This name antedates *Shortia* Torr. & Gray, 1842, a name applied to a well known genus of Diapensiaceae.

Since *Shortia* Rafin. is based on a typical species of *Arabis* the name need form no obstacle to the continued use of the later homonym.

Shortia Torr. & Gray is a very well known genus, of certain horticultural interest, and the name is here recommended for conservation.

3863 *Shuteria* Wight & Arn. Prodr. Fl. Pen. Ind. Or. i. 207 (1834)

versus

Shutereia Choisy in Mém. Soc. Genève, vi. 485 (1833).

Shuteria Wight & Arn. Leguminosae.

Adopted by: Meissn. Gen. 86 (1837); Hook. Ic. Pl. ii. t. 144 (1837); Endl. Gen. 1292, n. 6652 (1841); Walp. Rep. i. 761 (1842); Miq. Pl. Jungh. ii. 232 (1852); Benth. & Hook. f. Gen. Pl. i. 529 (1865); Baker in Oliv. Fl. Trop. Afr. ii. 177 (1871); Hook. f. Fl. Brit. Ind. ii. 181 (1876); Engl. & Prantl, Pflanzenfam. iii. III. 360 (1894); Trimen, Handb. Fl. Ceyl. ii. 58 (1894); Hemsl. in Hook. Ic. Pl. xxvii. t. 2626 (1900); Cooke, Fl. Bombay, i. 361 (1902); Pampanini in Nuov. Giorn. Bot. Ital. n.s. xvii. 29 (1910); Lecomte, Fl. Gén. Indo-Chine, ii. 402 (1916); Léveillé, Cat. Pl. Yunnan, 161 (1917); Gamble, Fl. Madras, Pt. II. 350 (1918); Fyson, Fl. Nilgiri & Pulney Hilltops, iii. 315 (1920); Craib in Kew Bull. 1927, 61; Osmaston, Forest Fl. Kumaon, 170 (1927); Craib, Enum. Fl. Siam. i. 437 (1928).—Species about seven from India, China, Siam, and Tropical Africa.

Standard species: *S. vestita* (Graham) Wight & Arn., one of the two original species.

Shuterea Choisy. Convolvulaceae.

Adopted by: G. Don, Gen. Syst. iv. 297 (1837); DC. Prodr. ix. 435 (1845); Fl. des Serres, Sér. I. iv. t. 421 (1848); House in Bull. Torr. Bot. Club, xxxiii. 318 (1906).

Most botanists include the genus *Shuterea* Choisy either in *Hewettia* Wight or in *Convolvulus* itself.

It is questionable whether *Shuterea* Wight & Arn. is a later homonym of *Shuterea* Choisy. If the view is taken that they are not homonyms, then *Shuterea* stands. As however, they may be considered homonyms, the writer recommends *Shuterea* Wight & Arn. for conservation. It is a well known genus of Leguminosae.

9446 *Sieberta* J. Gay in Mém. Soc. Hist. Nat. Paris, iii. 344 (1827) in adnot.

versus

Sieberta Spreng. Anleit. ii. ed. 2, i. 282 (1817).

Sieberta Hoppe in Flora, ii. 24 (1819).

Other later homonyms:—

Sieberta C. Presl in Isis, xxi. 275 (1828).

Sieberta Reichb. Consp. 145 (1828).

Sieberta J. Gay. Compositae.

Adopted by: Cass. Dict. lix. 125 (1829); DC. Prodr. vi. 531 (1837); Endl. Gen. 468, n. 2852 (1838); Meissn. Gen. 224 (1839); Spach, Vég. Phan. x. 8 (1841); Benth. & Hook. f. Gen. Pl. ii. 464 (1873); Boiss. Fl. Or. iii. 447 (1875); Engl. & Prantl, Pflanzenfam. iv. V. 315 (1892); Post, Fl. Syria, Palest. & Sinai, 448 (1896); Dalla Torre & Harms, Gen. Siphonog. 567 (1906); Small in New Phytologist, xvii. 22 (1918); Post, Fl. Syria, ii. 79 (1933).—One species in Syria, Asia Minor and Persia.

Standard species: *S. pungens* (Lam.) DC., the type.

J. Gay based his genus on *Xeranthemum pungens* Lam., but he appears never to have made the actual combination *S. pungens* (Lam.).

Sieberta Spreng. Orchidaceae.

This generic name was based on *Orchis bifolia*, *nigra*, *viridis*, *albida*, etc. No one seems to have taken up the name and it is now universally regarded as a synonym of *Gymnadenia* R. Br.

Sieberta Hoppe. Caryophyllaceae.

Adopted by: Reichb. Fl. Germ. Excurs. 783 (1832); Spach, Vég. Phan. v. 205 (1836); Reichb. Ic. Fl. Germ. v. t. 204 (1841).

This generic name is now sunk under *Minuartia*. (For full synonymy see Sprague in Kew Bull. 1920, 311–313.)

The above two generic names *Sieberta* Spreng. and *Sieberta* Hoppe are earlier homonyms of *Sieberta* J. Gay. Neither of them is likely to be reinstated as an independent genus.

There are in addition two later homonyms, namely, *Sieberta* C. Presl in Isis, xxi. 275 (1828), which is now regarded as

synonymous with *Anredera* Juss.; and *Sieberta* Reichb. Consp. 145 (1828), which although adopted by: Benth. Fl. Austral. iii. 351 (1866), Hook. Ic. Pl. xxviii. t. 2740 (1902) and F. M. Bailey, Compr. Cat. Queensl. Pl. 231 (1913?), is generally regarded as synonymous with *Trachymene* Rudge (1811)—see Domin in Bull. Géogr. Bot. xviii. 481 (1908), where a critical review of the genera is given.

The case for the conservation of the generic name *Sieberta* J. Gay, it must be admitted, is not a strong one. Already there exists a later synonym, namely *Fleurotia* Reichb. Nom. 90 (1841), but the specific epithet has never been transferred from *Sieberta* to *Fleurotia*.

Perhaps, therefore, the name *Sieberta* J. Gay should be conserved for this genus of Compositae to which it is now usually attached.

2418 *Silvaea* Philippi in Bot. Zeit. 681 (1857), nomen; Philippi, Fl. Atacam. 21, t. 1 (1860)

versus

Silvaea Hook. & Arn. Bot. Beechey Voy. 211 (1836).

Silvaea Phil. Portulacaceae.

(Named in honour of Waldi Silva)

Adopted by: Benth. & Hook. f. Gen. Pl. i. 159 (1862); Engl. & Prantl, Pflanzenfam. iii. IB. 59 (1889); Dalla Torre & Harms, Gen. Siphonog. 155 (1900); Reiche, Fl. Chile, ii. 359 (1898).—Four species from Chile.

Standard species: *S. pachyphylla* Phil., one of the four original species, and the only one figured.

Silvaea Hook. & Arn. Euphorbiaceae.

This genus is almost universally sunk under *Trigonostemon* Blume (1825).

Since the earlier homonym appears to form no obstacle, the later homonym *Silvaea* Phil. is put forward for conservation. It is a well known Chilean genus.

(sub 2818) *Silvia* Allem. Pl. Nov. Brazil. p. 19 (1848)

versus

Silvia Vell. Fl. Flum. p. 55 (1825); Fl. Flum. i. t. 149 (1827).

Silvia Benth. in DC. Prodr. x. 513 (1846).

Silvia Allem. Lauraceae.

This spelling of the name is correct since it is definitely not a typographical nor an orthographical error. This genus was named in honour of Balthazari a Silva Lisboa.

The name was "corrected" by Meissner in DC. Prodr. xv. I. 84 (1864) to *Silvaea*, but this action is not warranted.

The date of *Silvia* Allem. is frequently quoted as 1845, but the date 1848 as written above is in accordance with those taken from Bot. Zeit. 1854, p. 454.

Silvia Allem. consists of about seven species from Brazil. The generic name is retained by Sampaio in Bol. Mus. Nac. Rio de Janeiro, iv. 39 (1928); Sandwith in Kew Bull. 1933, 338, and Ducke in Trop. Woods, xlii. 18 (1935), where he gives a review of the genus. Dalla Torre & Harms, Gen. Siphonog. p. 178, reduce the genus to *Mezilaurus*, and Benth. & Hook. f. Gen. Pl. iii. 154, reduce it to *Endiandra*.

Silvia Vell. Scrophulariaceae.

This genus does not appear to have been accepted by any botanists since the above date. The Index Kewensis records only the original species *S. curialis* Vell., which is universally reduced to a species of *Escobedia* (1794).

Silvia Benth. Scrophulariaceae.

This genus is kept up by several well known botanists, including Lindl. Veg. Kingd. 685 (1847) [*Sylvia*]; Benth. & Hook. f. Gen. Pl. ii. 972 (1876); Engl. & Prantl, Pflanzenfam. iv. IIIB. 92 (1891); Dalla Torre & Harms, Gen. Siphonog. 462 (1904).

There are two species included in the genus from Mexico.

This genus has been considered by Pennell in his revision of the Scrophulariaceae, and in Proc. Acad. Philad. lxxx. 434 (1928) Pennell changed the name *Silvia* to *Silviella* nom. nov. giving as a synonym *Silvia* Benth. not *Silvia* Vell. (1825), nor *Silvia* Allem. (1845) Pennell also includes the two necessary transferences, namely, *Silviella serpyllifolia* (H.B.K.) and *S. prostata* (H.B.K.).

In view of this change, therefore, it is *not* advisable to put forward *Silvia* Benth. for conservation.

Since *Silvia* Vell. and *Silvia* Benth. are not likely to form any obstacle, and since the well-known genus *Silvia* Allem. has been retained under that name as recently as 1935, the name is here put forward for conservation. The fact that it has been incorrectly spelt *Silvaea* need not be taken into consideration.

Confusion between *Silvaea* Phil. and *Silvia* Allem. should not arise since they are not even phonetic homonyms, and the genera were named after different individuals.

2039 **Simsia** R. Br. in Trans. Linn. Soc. x. 152 (1810), Proteaceae

versus

(sub 9211) *Simsia* Pers. Syn. ii. 478 (1807), Compositae.

Some botanists have kept up *Simsia* R. Br. (1810) and have sunk *Simsia* Pers. under *Encelia* Adans. e.g. Roem. & Schult. Syst. iii. 24, 406 (1818); Spreng. Syst. i. 474 (1825); Engl. &

Prantl, Pflanzenfam. iii. I. 139 (1888); Dalla Torre & Harms, Gen. Siphonog. 126 (1900). There are about five species from Western Australia.

There is, however, a later synonym *Stirlingia* Endl. which is the correct name for the genus unless *Simsia* R. Br. is conserved; the transferences from *Simsia* have been made and the name *Stirlingia* is kept up by Endlicher and by Bentham & Hooker.

The generic name *Simsia* Pers. Syn. ii. 478 (1807) is adopted by many of the earlier botanists including DC. Prodr. v. 577 (1836); Endl. Gen. 412, n. 2533 (1838); Meissn. Gen. 203 (1839); Spach, Vég. Phan. x. 20 (1841).

Blake also in Proc. Amer. Acad. xlix. 376 (1913) keeps up the name and gives an account of the genus which he states contains about 22 species from Western America and one from Jamaica.

In the circumstances, therefore, *Simsia* R. Br. is *not* put forward for conservation, and the earlier homonym *Simsia* Pers. stands.

***Siphonella** Small, Fl. S.E.U.S. 1129 (1903). Valerianaceae.

Siphonella A. A. Heller in Muhlenbergia, 1912, viii. 57. Polemoniaceae.

This appears to be a case where the law of priority must be observed. Sufficient time has not elapsed to show how subsequent botanists view these genera. Thus *Siphonella* A.A. Heller should not be conserved.

6580 **Skytanthus** Meyen, Reise, i. 376 (1834). Apocynaceae.
versus

Scytanthus Liebm. in Forh. Skand. Nat. 4, Moede 1844 (1847) 177; Solms-Laub. in Engl. Pflanzenreich, Rafflesiac. 17 (1901). Rafflesiaceae.

Scytanthus Hook. Ic. Pl. t. 605, 626 (1844) = *Hoodia* Sweet.

Scytanthus T. Anders. ex Benth. & Hook. f. Gen. Pl. ii. 1093 (1876) = *Thomandersia*.

It is apparent that the above generic name has been used for several different genera, the spelling *Skytanthus* being a mere variant of *Scytanthus*. Owing to this difference of spelling, however, *Skytanthus* Meyen (1834) and *Scytanthus* Liebm. have been regarded as different genera and both names have been retained. Art. 70, note 3, states, "In deciding whether two or more slightly different names should be treated as distinct or as orthographic variants, the essential consideration is whether they may be confused with one another or not; if there is serious risk of confusion they could be treated as orthographic variants."

Undoubtedly there is risk of confusion between *Skytanthus* and *Scytanthus* especially as the name *Skytanthus* has been "corrected" to *Scytanthus*, vide Post and Kuntze, Lexic. 512 (1903).

In view of the above, therefore, the earliest generic name *Skytanthus* Meyen (1834) stands, and the others are later homonyms. Of these the only one retained as an independent genus is *Scytanthus* Liebm., which now becomes *Bdallophyton* Eichl. in Bot. Zeit. xxx. 709 (1872).

7845 *Slackia* Griff. Not. iv. 158 (1854)

versus

Slackia Griff. Itin. Notes, 187 (1848).

Slackia Griff. Not. iii. 162 (1851).

Slackia Griff. (1854). Gesneriaceae.

Adopted by: Benth. & Hook. f. Gen. Pl. ii. 1017 (1876); DC. Monogr. Phan. v. 188 (1883); Engl. & Prantl, Pflanzenfam. iv. IIIB. 160 (1894); Fritsch in Oesterr. Bot. Zeitschr. xliii. 84 (1893); Dalla Torre & Harms, Gen. Siphonog. 473 (1904); Kränzlin in Philipp. Journ. Sc., Bot. 1913, viii. 171.—One species from Burma.

Standard species: *S. Griffithii* C. B. Clarke, the type.

Slackia Griff. (1848). Lardizabalaceae.

This genus appears to be retained by no botanists except O. Kuntze. It is sunk under the genus *Decaïsnea* Hook. f. & Thoms. (1854). On the face of things it would seem as though *Slackia* Griff. (1848), being the earlier name, should stand in preference to *Decaïsnea*, but the particulars given by Griffith cannot be regarded as a generic description, for they are merely field notes, in fact Fritsch in Oesterr. Bot. Zeitschr. xliii. 85 (1893) definitely states that to him it is a "nomen nudum" and that *Decaïsnea* is the correct name for the genus in question.

Slackia Griff. (1851). Palmae.

This genus is universally regarded as *Iguanura* Bl. (1838), and it is extremely unlikely that it will ever be revived as an independent genus.

In view of the facts given above, however, the writer does not feel justified in putting forward the generic name *Slackia* Griff. (1854) for conservation. As Griffith himself gave the name to three different genera, the date would always have to be quoted in order to know which of the three was meant. Also there is already a valid later name for the genus in *Beccarinda* O. Kuntze, Rev. Gen. ii. 470 (1891).

The species has also been transferred. If the name *Beccarinda* is used there can be no confusion and there is no need for any nomenclatural change.

8772 *Soaresia* Sch.-Bip. in Pollichia, xx.-xxi. 376 (1863)

versus

Soaresia Fr. Allem. in Rev. Braz. i. 210 (1857); et in Arch. Palestra Sc. Rio de Janeiro, 142 (1858).

Soaresia Sch.-Bip. Compositae.

Adopted by: Baker in Mart. Fl. Bras. vi. II. 150 (1873); Benth. & Hook. f. Gen. Pl. ii. 236 (1873); Engl. & Prantl, Pflanzenfam. iv. V. 130 (1890); Dalla Torre & Harms, Gen. Siphonog. 526 (1905).—Species 1, Western Brazil.

Standard species: *S. velutina* Sch.-Bip., the type.

Soaresia Fr. Allem. Moraceae.

Bentham in Kew Journ. Bot. v. 270 (1853) gives some account of the Proceedings of the Vellosian Society of Rio de Janeiro, and he enumerates certain of their botanical papers, amongst which he quotes "(6) Account of an excursion to the Fazenda de Guaxindiba, near San Gonçalo, with the description of a new genus of Artocarpeae, by Dr. Allemão." Then Bentham adds "*Soaresia nitida* is the name the author here gives to what appears to be a good genus, allied in some respects to *Pseudolmedia* of Trécul."

These remarks of Bentham are added here because up to the present the original citation (1857) of the generic name has not been checked, the work not being in the Kew Library. The genus, however, has not been considered as independent since the time of Allemão, and only one other species has been recorded, *S. ilicifolia* Glaz. Most botanists reduce it to *Clarisia* Ruiz & Pav. (1794), cf. Index Kewensis, p. 928; Dalla Torre & Harms, Gen. Siphonog. p. 121; Post & Kuntze, Lexic. p. 522.

Although *Soaresia* Allem. is unlikely ever to be revived as an independent genus, the case for the conservation of *Soaresia* Sch.-Bip. is not a very strong one. It is a very small genus (only one species) and of no economic value. Unless the name is conserved, however, a new one must be found for the genus, and in order to avoid making a new generic name, *Soaresia* Sch.-Bip. is here put forward for conservation.

7414 *Solandra* Sw. in Vet.-Akad. Handl. Stockh. viii. 300, t. 11 (1787)

versus

Solandra L. Syst. ed. 10, 1269 (1759).

Solandra Murr. in Comm. Goett. 1783-4, vi. 21, t. 1 (1785).

Solandra Sw. Solanaceae.

Adopted by: Sw. Prodr. iii. 42 (1788); Schreb. Gen. ii. 793 (1791); Sw. Fl. Ind. Occ. i. 386, t. 9 (1797); Willd. Sp. Pl. i. 936 (1798); Pers. Syn. i. 218 (1805); Spreng. Syst. i. 701 (1825); Lindl. Bot. Reg. xviii. t. 1551 (1832); G. Don, Gen. Syst. iv. 475 (1837); Endl. Gen. 664, n. 3846 (1839); Mart. Fl. Bras. x.

158 (1846); Miers in Lond. Journ. Bot. v. 148 (1846); Dunal in DC. Prodr. xiii. I. 533 (1852); Benth. & Hook. f. Gen. Pl. ii. 901 (1876); Engl. & Prantl, Pflanzenfam. iv. IIIB. 27 (1891); Britton & Rusby in Bull. Torr. Bot. Cl. 1899, 199; Dalla Torre & Harms, Gen. Siphonog. 451 (1904); N. E. Br. in Kew Bull. 1911, 345; L. H. Bailey, Stand. Cycl. Hort. vi. 3180 (1917); Urban, Symb. Antill. viii. 625 (1921).—About six species from Trop. America.

Standard species: *S. grandiflora* Sw., the original species.

Solandra L. Umbelliferae.

This genus has been retained by Linn. Sp. Pl. ed. 2, 1407 (1763); Adans. Fam. ii. 102 (1763); Crantz, Umbellif. 122 (1767); Scop. Introd. 108 (1777). Since that time it appears to have been sunk by almost all botanists either under *Hydrocotyle* L. (1753) or under *Centella* L. (1760) and it seems very unlikely that it will be revived as an independent genus in the future.

Solandra Murr. Malvaceae.

This genus was adopted by Pers. Syst. 661 (1797) [Linné, Syst. Veg. ed. 15]; Cav. Diss. v. 279, t. 136 (1788); Juss. Gen. 273 (1789); Poir. Dict. xlix. 404 (1827).

It is, however, now universally reduced to *Hibiscus* L. (1753).

As the genus *Solandra* Sw. is kept up by almost all botanists as seen from the many references quoted above, and as the two earlier homonyms are usually reduced, there is a strong case in favour of the conservation of the name *Solandra* Sw.

The genus is well known botanically and horticulturally. There is no later synonym available. It is true the generic name *Swartzia* J. F. Gmel. Syst. ii. 360 (1791) is a later synonym, but that is virtually a nomen rejiciendum as the name *Swartzia* Schreb. (1791) is conserved. See Internat. Rules, ed. 3, p. 98 (1935). There is also the name *Solandra* O. Kuntze, Rev. Gen. ii. 452 (1891) but this is merely an orthographic "correction." In order to avoid many nomenclatural changes therefore, and to retain this well known name, it is put forward unhesitatingly for conservation.

8918 **Sommerfeltia** Less. Syn. Compos. 189 (1832)

versus

Sommerfeldtia Schumach. & Thonn. Beskr. Guin. Pl. 331 (1827).

Sommerfeltia Flörke apud Sommerfeldt in K. Norske Vidensk. Skrift. vol. ii. II. 60 (1827).

Sommerfeltia Less. Compositae.

Adopted by: DC. Prodr. v. 302 (1836); Endl. Gen. 380, n. 2344 (1837); Meissn. Gen. 185 (1839) (*Sommerfeldtia*); Spach, Vég. Phan. x. 31 (1841); Walp. Rep. ii. 952 (1843) (*Sommerfeldtia*); Benth. & Hook. f. Gen. Pl. ii. 275 (1873); Baker in Mart. Fl. Bras. vi. III. 26 (1882); Baill. Hist. Pl. viii. 140 (1882);

Engl. & Prantl, Pflanzenfam. iv. V. 166 (1890); Dalla Torre & Harms, Gen. Siphonog. 534 (1905); Arech. Fl. Urug. iii. (An. Mus. Nac. Montevideo, vi.) p. 200, t. 36 (1908).—One species from Brazil.

Standard species: *S. spinulosa* (Spreng.) Less., the type.

Sommerfeldtia Schumach. & Thonn. Leguminosae.

This genus included one species only, *S. obovata* Schumach. & Thonn. As far as can be ascertained the genus has never been kept up and is unanimously reduced to *Drepanocarpus* G.F.W. Mey. (1818), cf. Pfeiffer, Nomencl. Bot. ii. II. 1195 (1874); Post & Kuntze, Lexic. 524 (1903) and Dalla Torre & Harms, Gen. Siphonog. 239 (1900).

Sommerfeltia Flörke apud Sommerfeldt. Peltigeraceae.

The above reference is taken from Zahlbr. Cat. Lichen. Univ. iii. 418 (1925) and refers to *Sommerfeltia arctica* Flörke. The writer has been unable to consult the actual work, so it is not certain whether the generic description appears in the same place.

For the purposes of this paper, however, it is sufficient to state that this lichen genus is no longer kept up, being regarded as synonymous with *Solorina* Ach. (1808).

The genus *Sommerfeltia* Less. is retained in all works dealing with that group. It is monotypic, and as far as can be ascertained there is no later synonym. In order, therefore, not to make a new generic name, *Sommerfeltia* Less. is here put forward for conservation. Neither of the earlier homonyms appears in the least likely to be revived as an independent genus.

4957 **Sparrmannia** L. f. Suppl. 41, 265 (1781)

versus

Sparrmannia Buc'hoz, Pl. Nouv. Découv. t. 1, p. 3 (1779).

The generic name *Sparrmannia* L. f. has been spelt with one "r" or two, both by the author himself and by subsequent botanists.

Linné f. described the genus on page 41 of his Supplementum, where he spelt the name *Sparmannia*, and stated that it was in memory of A. Sparrmann. Later on in the same work on page 265, he describes the species, and there the genus is spelt *Sparrmannia*. In the Index to the work, the name is also spelt *Sparrmannia*. The spelling *Sparrmannia* is more correct philologically than *Sparmannia*, and it should, therefore, be adopted in accordance with International Rules, ed. 3, Art. 71, (2): 1935.

Sparrmannia L. f. Tiliaceae.

This very well known generic name has been adopted by almost all botanists including: Thunb. Nov. Gen. v. 88 (1784); Schreb. Gen. i. 355 (1789); Juss. Gen. 290 (1789); Thunb. Prodr. ii. 92 (1800); Willd. Sp. Pl. ii. 1160 (1800); Pers. Syn. ii.

64 (1807) ; DC. Prodr. i. 503 (1824) ; Spreng. Syst. ii. 572 (1825) ; G. Don, Gen. Syst. i. 541 (1831) ; Spach, Vég. Phan. iv. 5 (1835) ; Meissn. Gen. 37 (1837) ; Endl. Gen. 1007, n. 5369 (1839) ; Harv. in Harv. & Sond. Fl. Cap. i. 223 (1859-60) ; Benth. & Hook. f. Gen. Pl. i. 235 (1862) ; Masters in Oliv. Fl. Trop. Afr. i. 260 (1868) ; Engl. & Prantl, Pflanzenfam. iii. VI. 22 (1890) ; Dalla Torre & Harms, Gen. Siphonog. 306 (1901) ; Thonner, Fl. Pl. Afr. 350 (1915) ; Phillips, Gen. S. Afr. Fl. Pl. 399 (1926).—About four species from Tropical and South Africa.

Standard species : *S. africana* L. f., the type.

Sparmannia Buc'hoz. Scrophulariaceae.

This genus has never been kept up. It is however an earlier name for the genus *Rehmannia* Libosch. and on this account the generic name *Rehmannia* Libosch. ex Fisch. & Mey. Ind. Sem. Hort. Petrop. i. 36 (1835), has been conserved against *Sparmannia* Buc'hoz—see Internat. Rules Bot. Nomencl. ed. 3, 107 (1935).

In Post & Kuntze, Lexic. 590 (1903), there is indexed the name *Vossianthus* O.K. 1900 (Gaertnerisch. Centr. Bl. : 653) as a new name for *Sparmannia* L. f. No subsequent botanist has adopted this name. For such a well known genus as *Sparmannia* L. f., important both from a botanical and horticultural standpoint, the writer has no hesitation in recommending the name for conservation. Although the earlier *Sparmannia* is a nomen rejiciendum and therefore cannot be used again, the later homonym, *Sparmannia* L. f. cannot be used unless it is conserved (Art. 61).

5589 *Spermolepis* Brongn. & Gris in Bull. Soc. Bot. France, x. 577 (1863)

versus

Spermolepis Raf. Neogenyt. 2 (1825).

Spermolepis Brongn. & Gris. Myrtaceae.

Adopted by : Brongn. & Gris in Ann. Sc. Nat. Sér. V. ii. 136 (1864) ; Benth. & Hook. f. Gen. Pl. i. 710 (1865) ; Brongn. & Gris in Nouv. Arch. Mus. Hist. Nat. Paris, iv. t. 9, p. 22 (1868) ; Engl. & Prantl, Pflanzenfam. iii. VII. 88 (1893) ; Dalla Torre & Harms, Gen. Siphonog. 349 (1903) ; Guillaumin, Cat. Pl. Phan. N. Caled. 74 (1911) extr. from Ann. Mus. Col. Marseille, Sér. II. ix. 146 (1911) ; Heckel in Ann. Mus. Col. Marseille, Sér. II. x. 207, t. 1 (1912).—Two species from New Caledonia.

Standard species : *S. gummifera* Brongn. & Gris, the better known of the two original species.

Spermolepis Raf. Umbelliferae.

Adopted by : Coulter & Rose in Contrib. U.S. Nat. Herb. vii. 87 (1900) ; Robinson in Rhodora, x. 34 (1908) ; Britton & Brown, Ill. Fl. N. States & Canada, ed. 2, ii. 651 (1913).

As the genus *Spermolepis* Raf. has been recently revived by certain American botanists it would be unwise to suggest the later name *Spermolepis* Brongn. & Gris for conservation, especially as the latter is such a small genus having only a limited distribution. A later synonym of *Spermolepis* Brongn. & Gris is *Arillastrum* Panch. ex Brongn. & Gris in Bull. Soc. Bot. France, xiv. 253 (1867), but this name could not date from the reference just quoted, as Brongn. and Gris did not recognise the genus as distinct from *Spermolepis*, but included *Arillastrum* Panch. MS. in it. This name can either be established for *Spermolepis*, or a new name may be found for the genus concerned. *Spermolepis* Brongn. & Gris, therefore, is *not* recommended for conservation.

6670 *Spirolobium* Baill. in Bull. Soc. Linn. Paris, 773 (1889)
versus
Spirolobium Orb. Voy. Amér. Mérid. vii. Pt. I., Sert. Patag. t. 13 (1839).

Spirolobium Baill. Apocynaceae.

Adopted by : Baill. Hist. Pl. x. 215 (1891) ; Engl. & Prantl, Pflanzenfam. iv. II. 174 (1895) ; Post & Kuntze, Lexic. 530 (1903) ; Dalla Torre & Harms, Gen. Siphonog. 409 (1904).—One species from Cambodia.

Standard species : *S. cambodianum* Baill., the type.

Spirolobium Orb. Leguminosae.

This genus contains only one species, the one originally described by d'Orbigny. As far as can be ascertained, the genus has never been retained by any subsequent botanist ; it is universally sunk under *Prosopis* L. (1767).

Although *Spirolobium* Baill. is a small genus (monotypic) and of restricted distribution, it nevertheless has no synonyms. Therefore if the name is not conserved, it will be necessary to give it a new name, and since the earlier *Spirolobium* Orb. is universally sunk, the generic name *Spirolobium* Baill. (Apocynaceae) is here recommended for conservation, in order to avoid any nomenclatural change.

913 *Spiroloema* Lindl. Bot. Reg. t. 47 (1840)
versus

Spiroloema Raf. Fl. Tellur. iv. 92 (1836).

Spiroloema Lindl. Commelinaceae.

Adopted by : Endl. Gen. Suppl. 1, 1356, n. 1031/2 (1841) ; Meissn. Gen. i. 406 (1842) ; Spach, Vég. Phan. xiii. 122 (1846) ; Benth. & Hook. f. Gen. Pl. iii. 854 (1883) ; Engl. & Prantl, Pflanzenfam. ii. IV. 69 (1888) ; Dalla Torre & Harms, Gen. Siphonog. 58 (1900) ; Brückner in Engl. & Prantl, Pflanzenfam. Aufl. 2, xva. 171 (1930).—Probably two species from Mexico.

Standard species : *S. fragrans* Lindl., the type.

Spironema Raf. Lauraceae.

This genus of Rafinesque is not kept up by any botanists. It is regarded as being synonymous with the genus *Cassytha* L. 1753 (see Dalla Torre & Harms, Gen. Siphonog. p. 179).

There is still another *Spironema* of a later date, namely, *Spironema* Hochst. in Flora, xxv. 226 (1842), Verbenaceae; it was, however, published as a synonym of *Cyclonema* Hochst. Both these names are now reduced to *Clerodendron*.

The genus *Spironema* Lindl., Commelinaceae, appears to have no later available name; therefore, since it has always been accepted, and in order to save any nomenclatural change, it is here recommended for conservation.

2250 **Spirostachys** S. Wats. in Proc. Amer. Acad. ix. 125 (1874)
versus

Spirostachys Ung.-Sternb., Vers. Syst. Salicorn. 100 (1866).

Spirostachys Sonder in Linnaea, xxiii. 106 (1850).

Spirostachys S. Wats. Chenopodiaceae.

Adopted by: Benth. & Hook. f. Gen. Pl. iii. 63 (1880); Engl. & Prantl, Pflanzenfam. iii. 1A. 74 (1893); Dalla Torre & Harms, Gen. Siphonog. 144 (1900); Jepson, Fl. Calif. Pt. 4, 444 (1914).—Species about 3 from North and South America.

Standard species*: *S. occidentalis* S. Wats., the type.

Spirostachys Sond. Euphorbiaceae.

Adopted by: Walp. Ann. iii. 360 (1853); Baill. Étud. Gen. Euphorb. 521, 522 (1858), where he makes the new species *S. madagascariensis*; Pax in Engl. Pflanzenreich, Euphorb.-Hippom. 153 (1912).

Pax has revived this genus and includes in it four species (1) *S. venenifera* Pax based on *Excoecaria venenifera* Pax (1894), (2) *S. synandra* Pax (*Excoecaria synandra* Pax), (3) *S. africana* Sond., and (4) *S. glomeriflora* Pax (*Excoecaria glomeriflora* Pax).

He excludes from the genus *Spirostachys* *madagascariensis* Baill., which he regards as *Excoecaria madagascariensis* Müll.-Arg.

The type species is *S. africana* Sond.

Spirostachys Ung.-Sternb. Chenopodiaceae.

Ungern-Sternberg quotes as synonyms of this generic name:

Halostachydis C. A. Meyer spec.

Halocnemi Bieb. spec.

Halopepleos spec. Bunge MS.

and the species *Spirostachys Ritteriana* Ung.-Sternb. was founded on *Halostachys Ritteriana* Moq.-Tand. This was, and is, the only species included in the genus. At the present time it appears to be almost universally sunk under *Heterostachys*, see Dalla Torre & Harms, Gen. Siphonog. p. 144, also Index Kewensis, ii. p. 967. Post & Kuntze, however, keep it up as a genus of *Blitaceae*.

As the genus *Spirostachys* Sond., Euphorbiaceae, is kept up, it seems very inadvisable to suggest *Spirostachys* S. Wats. for conservation, especially as there already exists a valid name for this genus, namely, *Allenrolfea* O. Kuntze, Rev. Gen. ii. 545 (1891), where the species of *Spirostachys* are also transferred to *Allenrolfea*.

4715 **Stachyanthus** Engl. in Engl. & Prantl, Pflanzenfam. Nachtr. 227 (1897)

versus

Stachyanthus DC. Prodr. v. 84 (1836).

Stachyanthus Engl. Icacinaceae.

Adopted by: Engl. in Engl. Jahrb. xxiv. 487 (1898); Dalla Torre & Harms, Gen. Siphonog. 293 (1901); and by Spencer Moore in Journ. Bot. 1920, lviii. 221, where he makes two new species.—Species three, from Cameroons, Nigeria and Belgian Congo.

Standard species: *S. Zenkeri* Engl., the type.

Stachyanthus DC. Compositae.

Adopted by: Endl. Gen. 362, n. 2229 (1837); Meissn. Gen. 177 (1838); Spach, Vég. Phan. x. 39 (1841).

This genus appears to be included by almost all botanists under *Eremanthus* Less. (1829), see Index Kewensis, ii. 971; Dalla Torre & Harms, Gen. Siphonog. 526, and Post & Kuntze, Lexic. 531. In Mart. Fl. Bras. vi. II. 168 (1873) *Stachyanthus* is regarded as a section of the genus *Eremanthus*.

It does not seem likely that it will be restored to independent generic rank.

In Post and Kuntze, Lexic. p. 531, mention is made of still another *Stachyanthus* attributed to Bl. (1855) = *Phyllorchis* (1809). Up to the present the writer has been unable to trace the name *Stachyanthus* Bl. (1855).

Stachyanthus Engl., Icacinaceae, is a small genus with only three species. There is, however, no later valid name for the genus, and therefore in order not to have any changes in nomenclature *Stachyanthus* Engl. is put forward for conservation.

***Stapeliopsis** Pillans in S. Afr. Gard. 1928, xviii. 32. Asclepiadaceae.

Stapeliopsis Choux in Compt. Rend. 1931, cxci. 1444, 1446. Asclepiadaceae.

Stapeliopsis Phillips in Fl. Pl. S. Afr. xii. t. 445 (1932). Asclepiadaceae.

Stapeliopsis Pillans.

1 species, *S. Neronis* Pillans from Namaqualand.

Stapeliopsis Choux.

1 species, *S. madagascariensis* Choux from Madagascar.

This name has been changed to *Stapelianthus* Choux—see Ann. Mus. Col. Marseille, 1934, Sér. V. ii. Fasc. 3, 6, in obs., et in adnot.

Stapeliopsis Phillips.

1 species, *S. Cooperi* (N. E. Brown) Phillips from S. Africa, which is based on *Stapelia Cooperi*.

This genus has been re-named *Stultitia* Phillips in Fl. Pl. S. Afr. xiii. t. 520 (1933), and the species *Stapeliopsis Cooperi* = *Stultitia Cooperi*. Another species has been added to the genus, namely *Stultitia Tapscottii* (Verdoorn) Phillips, l.c.: *Stapelia Tapscottii*.

Therefore *Stapeliopsis* Pillans stands in accordance with the rule of Priority.

1057 **Steinmannia** Phil. f. Anal. Univ. Chile, lxxv. 65 [10] (1884)
versus
Steinmannia Opiz, Seznam, 93 (1852).

Steinmannia Phil. f. Liliaceae.

Adopted by : Dalla Torre & Harms, Gen. Siphonog. 66 (1900) ; Krause in Engl. & Prantl, Pflanzenfam. Aufl. 2, 324 (1930) ; Hutchinson, Fam. Fl. Pl. ii. 132 (1934).—One species from Chile.

Standard species : *S. graminifolia* Phil. f., the type.

Steinmannia Opiz. Polygonaceae.

This genus is universally reduced to *Rumex*. Originally the author assigned to it two species, and no botanist has subsequently added to this.

Intrinsically the generic name *Steinmannia* Phil. f. has little claim for conservation. It is a monotypic genus, very little known and of restricted distribution. If the name is not conserved, however, a new name must be given to the genus, and as the earlier homonym *Steinmannia* is universally reduced, it seems desirable to conserve the name *Steinmannia* Phil. f. for the Liliaceous genus.

2719 **Stenanthera** (Oliv.) Engl. & Diels in Notizbl. Bot. Gart. Berlin, iii. 57 (1900)
versus
Stenanthera R. Br. Prodr. 538 (1810).

Stenanthera (Oliv.) Engl. & Diels. Annonaceae.

Adopted by : Dalla Torre & Harms, Gen. Siphonog. 174 (1900) ; Engl. Monogr. Afr. Pfl.-Fam. vi. Annonac. p. 67 (1901) ; De Wild. Études Fl. Bas- et Moyen-Congo (Ann. Mus. Congo, Bot. Sér. V.) i. 45 (1903) ; Hutchinson & Dalziel, Fl. W. Trop. Afr. i. 56 (1927).—Species about 8 from Tropical Africa.

Standard species : *S. myristicifolia* (Oliv.) Engl. & Diels.

Stenanthera R. Br. Epacridaceae.

Adopted by : Bot. Reg. iii. t. 218 (1817) ; Lodd. Bot. Cab. iii. t. 228 (1818) ; Roem. & Schult. Syst. v. 469, n. 770 (1819) ; Spreng. Gen. i. 137, n. 685 (1830) ; Meissn. Gen. 248 (1839) ; Spach, Vég. Phan. ix. 435 (1840).

Stenanthera R. Br. is now included in *Styphelia* Sm., see Dalla Torre & Harms, Gen. Siphonog. p. 386, and Post & Kuntze, Lexic. p. 534.

Although *Stenanthera* R. Br. is not likely to be revived, the generic name *Stenanthera* (Oliv.) Engl. & Diels is not proposed for conservation because Exell in Journ. Bot. 1935, lxxiii. Suppl. p. 5 has proposed a new name for it, namely, *Neostenanthera*, and has also made one new species and seven new combinations under that name.

4261 **Stenocalyx** Turcz. in Bull. Soc. Nat. Mosc. xxxi. Pt. I. 393 (1858)
versus

Stenocalyx Berg in Linnaea, xxvii. 309 (1856).

Stenocalyx Turcz. Malpighiaceae.

This genus contains one species only, namely *S. involuta* Turcz. from Colombia.

It is "kept up" by Dalla Torre & Harms, Gen. Siphonog. 265 (1901) and by Post & Kuntze, Lexic. 635 (1903).

Stenocalyx Berg. Myrtaceae.

Adopted by : Mart. Fl. Bras. xiv. I. 335 (1857), and more recently by Barb. Rodr. Myrt. Parag. 8 (1903).

Although *Stenocalyx* Berg has been reduced to *Eugenia* by a large number of botanists, such as Benth. & Hook. Gen. Pl. i. 719, and Dalla Torre & Harms, p. 348, the fact that it has been revived as lately as 1903 by Barbosa Rodrigues makes it very undesirable to conserve the name *Stenocalyx* Turcz. for the Malpighiaceae genus, which is monotypic, very little known, and has a restricted distribution. It will be necessary to find a new name for this genus.

Stenocalyx Turcz. is not put forward for conservation.

7227 **Stenogyne** Benth. in Bot. Reg. sub t. 1292 (1830)
versus

Stenogyne Cass. in Dict. Sc. Nat. I. 491, 493 (1827).

Stenogyne Benth. Labiatae.

Adopted by : Benth. Labiat. 654 (1835) ; Don. Gen. Syst. iv. 859 (1837) ; Endl. Gen. 630, n. 3675 (1838) ; Walp. Rep. iii. 900, 991 (1845) ; DC. Prodr. xii. 555 (1848) ; Benth. & Hook. f. Gen. Pl. ii. 1217 (1876) ; Hook. Ic. Pl. xiii. p. 37, t. 1248 (1877) ; Drake, Ill. Fl. Ins. Pacif. p. 52, t. 23 (1886) ; Hillebr. Fl. Haw.

Isl. 354 (1888); Engl. & Prantl, Pflanzenfam. iv. IIIA. 221 (1895); Post & Kuntze, Lexic. 535 (1903); Dalla Torre & Harms, Gen. Siphonog. 435 (1904); Lévillé in Fedde, Repert. x. 150 (1911); Forbes, Occas. Papers Bishop Mus. Honolulu, vi. 66 (1916).—About seventeen species from the Sandwich Islands.

Standard species: *S. rugosa* Benth., one of the three original species.

Stenogyne Cass. Compositae.

No species appears to have been described under this name. It is universally treated as a synonym of *Eriocephalus* L., see Index Kewensis, ii. p. 990; Dalla Torre & Harms, Gen. Siphonog. p. 557 and Post & Kuntze, Lexic. p. 535 [*Stenogyna*].

The name *Stenogyne* has also been used by Franchet in Bull. Soc. Bot. France, xxxi. 375 (1884), as a section of *Gentiana*.

As can be seen *Stenogyne* Benth. is an important and fairly large genus of Labiatae inhabiting the Sandwich Islands. If the name is not conserved, a new name will have to be given to the genus. Since the earlier homonym *Stenogyne* Cass. is universally included in *Eriocephalus*, the later homonym *Stenogyne* Benth. is now recommended for conservation.

3754 *Sutherlandia* R. Br. in Ait. Hort. Kew. ed. 2, iv. 327 (1812)
versus

Sutherlandia J. F. Gmel. Syst. ii. 1027 (1791).

Sutherlandia R. Br. Leguminosae.

Adopted by: Link, Enum. Hort. Berol. ii. 243 (1822); DC. Prodr. ii. 273 (1825); Spreng. Syst. iii. 242, n. 2551 (1826); G. Don, Gen. Syst. ii. 247 (1832); Meissn. Gen. 88 (1838); Endl. Gen. 1276, n. 6566 (1840); Walp. Rep. i. 683 (1842); Harv. in Harv. & Sond. Fl. Cap. ii. 212 (1861–62); Benth. & Hook. f. Gen. Pl. i. 503 (1865); Carr. in Rev. Hort. 1870–71, 611 (1871); Bois, Dict. Hort. 1140 (1893–99); Dalla Torre & Harms, Gen. Siphonog. 233 (1900); Bolus & Wolley Dod in Trans. S. Afr. Phil. Soc. xiv. III. 257 (1903); Sim, Native Timbers S. Africa, 226 (1921); Phillips, Gen. S. Afr. Fl. Pl. 328 (1926); M. R. Levyns, Guide Fl. Cape Penins. 153 (1929); Burt Davy, Man. Fl. Pl. & Ferns Transvaal, 358 (1932); Phillips & Dyer in Rev. Sudamer. Bot. i. 67 (1934).—About six species from South Africa.

Standard species: *S. frutescens* (L.) R. Br.

Sutherlandia J. F. Gmel. Sterculiaceae.

This genus is now sunk under *Heritiera* Dryand. It contained only one species, *S. littoralis* J. F. Gmel., which has become *Heritiera littoralis*. It seems extremely unlikely that anyone will wish to revive this genus.

There is yet another *Sutherlandia* that may be mentioned, namely, *Sutherlandia* Rausch. ex Steud. Nomencl. ed. 2, ii. 652 (1841). It is doubtful to what this name refers. In Pfeiffer, Nomencl. Bot. p. 1321 the reference is followed by "Quid?".

For the purpose of the present paper, therefore, the name need not be taken into consideration.

Sutherlandia R. Br. was based on *Colutea frutescens* L. It is a very well known genus with a wide geographical range in South Africa. Phillips & Dyer in Rev. Sudamer. Bot. i. pp. 69–80, have given a very comprehensive review of it, recognising six species and one variety; formerly the genus was considered to contain one very variable species. Phillips and Dyer have retained the name *Sutherlandia* R. Br. hoping that it will be conserved against the earlier *Sutherlandia* J. F. Gmel.

The name, accordingly, is here recommended without hesitation for conservation.

3582 *Sweetia* Spreng. Syst. ii. 171, 213 (1825)

versus

Sweetia DC. Prodr. ii. 381 (1825).

Sweetia Spreng. Leguminosae.

Adopted by: Spreng. Gen. i. 352 (1830); Benth. in Journ. Linn. Soc. viii. 261 (1865); Benth. & Hook. f. Gen. Pl. i. 559 (1865); Mart. Fl. Bras. xv. II. p. 3, t. 2 (1870); Taub. in Flora, lxxv. 82 (1892); Engl. & Prantl, Pflanzenfam. iii. III. 189 (1892); Dalla Torre & Harms, Gen. Siphonog. 221 (1900); Harms in Engl. Jahrb. xxxiii. Beibl. lxxii. 26 (1903); Pulle, Enum. Pl. Surinam, 221 (1906); Harms in Engl. Jahrb. xlii. 211 (1908).—About twelve species from South America.

Standard species: *S. fruticosa* Spreng., the type.

Sweetia DC. Leguminosae.

Adopted by: Reichb. Consp. 150 (1828); G. Don, Gen. Syst. ii. 342 (1832); Spach, Vég. Phan. i. 156 (1834); Meissn. Gen. 93 (1837).

According to Index Kewensis, ii. 1019, five species are recorded under this generic name, all of which are reduced—two to *Galactia* P. Br., one to *Derris*, one to *Tephrosia*, and one is followed by its locality.

Although this genus was retained by some of the older botanists as seen above, it is not now recognised as an independent genus. Dalla Torre & Harms, Gen. Siphonog. p. 243, include it under *Galactia*, as also do Post & Kuntze, Lexic. p. 544 (1903).

It will be noticed that the date of both *Sweetia* Spreng. and *Sweetia* DC. is the same, namely 1825, and the writer has been unable to ascertain which was published first. The author who

next mentioned the genera was Reichb. in his *Conspectus*, and there he keeps up *Sweetia* DC. and makes *Sweetia* Spreng. a synonym of *Acosmium*.

On account of the uncertainty of dates it seems desirable to draw up this case for the conservation of the name *Sweetia* Spreng. which is now universally kept up. It is a well known genus with wide distribution in South America. *Sweetia* Spreng. is here recommended for conservation.

***Symphyglossum** Schlechter in *Orchis*, 1919, xiii. 8
versus

Symphyoglossum Turcz. in *Bull. Soc. Nat. Mosc.* xxi. I. 255 (1848).

Symphyglossum Schlechter. Orchidaceae.

Two species from Colombia, Ecuador and Peru.

Standard species: *S. sanguineum* (Reichb. f.) Schlechter, one of the two original species.

Symphyoglossum Turcz. Asclepiadaceae.

This genus is reduced to *Cynanchum* Linn. It contained one species *S. hastatum* Turcz., which is reduced to *Cynanchum Wilfordi*, see *Index Kewensis*, ii. 1021, and Dalla Torre & Harms, *Gen. Siphonog.* 414.

Symphyglossum Schlechter is a small genus, and if considered independent, will have to receive a new name unless the present name is conserved.

As *Symphyglossum* Turcz. is now reduced to *Cynanchum* L., the name *Symphyglossum* Schlechter may be conserved if it is considered advisable.

***Synandrodaphne** Gilg in *Engl. Jahrb.* liii. 362 (1915)
versus

Synandrodaphne Meissn. in *DC. Prodr.* xv. I. 176 (1864).

Synandrodaphne Gilg. Thymelaeaceae.

One species from the Cameroons.

Standard species: *S. paradoxa* Gilg, the type.

Synandrodaphne Meissn. Lauraceae.

Modern botanists do not regard this genus as independent. It is sunk under *Nectandra* Roland ex Rottb., see Dalla Torre & Harms, *Gen. Siphonog.* 177, and Post & Kuntze, *Lexic.* 545. It originally contained two species, and no subsequent species have been added.

It is reasonable to assume that as far as the earlier homonym is concerned, there is no obstacle to the conservation of the later homonym. Therefore, if it is considered desirable the name *Synandrodaphne* Gilg may be conserved.

1260 **Syringodea** Hook. f. in *Bot. Mag.* t. 6072 (1873)

versus

Syringodea D. Don in *Edinb. New Phil. Journ.* xvii. 155 (1834).

Syringodea Hook. f. Iridaceae.

Adopted by: Fl. des Serres, *Sér. II.* x. t. 2096 (1874); Baker in *Journ. Bot.* xiv. 67 (1876); Klatt in *Abh. Nat. Ges. Halle*, xv. 402 (1882); Benth. & Hook. f. *Gen. Pl.* iii. 693 (1883); Engl. & Prantl, *Pflanzenfam.* ii. V. 143 (1888); Baker in *Kew Bull.* 1893, 158; Baker in *Dyer, Fl. Cap.* vi. 34 (1896); Baker in *Kew Bull.* 1897, 281; Dalla Torre & Harms, *Gen. Siphonog.* 80 (1900); Phillips in *Ann. S. Afr. Mus.* ix. 125 (1913); Phillips, *Gen. S. Afr. Fl. Pl.* 169 (1926); Diels in *Engl. Pflanzenfam.* Aufl. 2, xva. 475 (1930); Hutchinson, *Fam. Fl. Pl.* ii. 140 (1934).—Ten species from Western and Central Districts of South Africa.

Standard species: *S. pulchella* Hook. f.

Syringodea D. Don. Ericaceae.

Adopted by: D. Don, *Gen. Syst.* iii. 818 (1834); Knowles & Westc. *Floral Cab.* i. 81 (1837); Endl. *Gen. Suppl.* i. 1411, n. 4313b (1839).

It will be noticed in *Index Kewensis*, ii. 1026, that D. Don transferred a very large number of *Erica* species to his new genus. The genus, however, is now not kept up, being universally reduced to *Erica* L., see Dalla Torre & Harms, *Gen. Siphonog.* 384 (1903) and Post & Kuntze, *Lexic.* 547 (1903).

From the above bibliography under *Syringodea* Hook. f. Iridaceae, it will be seen that the genus is kept up by most botanists. It is a well-known genus and unless the name is conserved, it will have to receive a new name, thereby causing many nomenclatural changes.

As the earlier homonym is never likely to be revived, *Syringodea* Hook. f. is here recommended for conservation.

8976 **Tafalla** D. Don in *Edinb. New Phil. Journ.* xi. 273 (1831)
versus

Tafalla Ruiz & Pav. *Fl. Peruv. & Chil. Prodr.* 136, t. 29 (1794).

Tavalla Pers. *Syn.* ii. 633 (1807).

Tafallaea O. Kuntze, *Rev. Gen.* ii. 565 (1891).

Tafalla D. Don. Compositae.

Adopted by: Benth. & Hook. f. *Gen. Pl.* ii. 300 (1873); Engl. & Prantl, *Pflanzenfam.* iv. V. 185 (1890); Dalla Torre & Harms, *Gen. Siphonog.* 537 (1905); Mattfeld in *Notizbl. Bot. Gart. Berlin*, x. 775 (1929).—About five species from South America.

Standard species: *T. ferruginea* (Ruiz & Pav.) D. Don, one of the two original species.

Tafalla Ruiz & Pav. Chloranthaceae.

Six species are recorded under this name in Index Kewensis, ii. 1031, and all are reduced to *Hedyosmum*. The species were all made by the original authors Ruiz & Pav. All botanists appear to have regarded this genus as synonymous with *Hedyosmum* with the exception of Post & Kuntze, Lexic. p. 548, where the genus is kept up, and *Hedyosmum* Sw. 1788, non Mitch. 1748, is quoted as a synonym under it.

As Mitch. 1748 is pre-Linnean it is obvious that *Hedyosmum* Sw. 1788 stands, and *Tafalla* Ruiz and Pav. (1794) becomes the synonym. The original spelling *Tafalla* must, according to the International Rules, be retained; it may not be "corrected" to "Tafallaea."

Another spelling variant is *Tavalla* Pers. (1807), which also cannot stand.

The genus *Tafalla* D. Don, Compositae, is not a very large genus, nor even very well known. If the name is not conserved, the correct name for the genus will be the later synonym *Loricaria* Wedd. *Chloris* Andin. i. 165, t. 27*, A, B, C (1855), under which name some of the transferences from *Tafalla* have already been made.

In the circumstances, therefore, the name *Tafalla* D. Don is not recommended for conservation.

**Tainiopsis* Hayata, Ic. Pl. Formos. iv. 63 (1914). Orchidaceae. *Tainiopsis* Schlechter in Orchis, 1915, ix. 10. Orchidaceae.

Tainiopsis Hayata was based on *Tainia unguiculata* Hook. f., and being the earlier of the two names cited above, stands.

Tainiopsis Schlechter was published in February, 1915. The genus was based on *Tainia barbata* Lindl., and being a later homonym the name cannot stand without conservation. Even if such a course were considered advisable it is not necessary, as Rolfe in Orch. Rev. 1915, xxiii. 326, made the genus *Eriodes* and based it on the same type *Tainia barbata* Lindl. The correct name for the genus, therefore, is *Eriodes*, and for the species *Eriodes barbata* (Lindl.) Rolfe.

7142 *Tamonea* Aubl. Hist. Pl. Guian. Franç. ii. 659, t. 268 (1775)
versus

Tamonea Aubl. l.c. i. 441 [t. 175, as *Fothergilla*] (1775).

Tamonea Aubl. l.c. ii. 659. Verbenaceae.

It is doubtful whether according to the International Rules this *Tamonea* is a later homonym of *Tamonea* Aubl. l.c. i. 441, Melastomataceae. The names were published in vol. i. and in vol. ii., which are both dated 1775.

Aublet himself however in the Index to his work keeps up *Tamonea* (Verbenac.) vol. ii. p. 659, but he does not index *Tamonea* from vol. i. under that name, but changes it to *Fothergilla admirabilis* in the index, and on the plate it is named *Fothergilla Mirabilia*.

Since the author himself kept up *Tamonea* Aubl. (Verbenac.) and it has been retained by almost all botanists subsequently, it seems reasonable to regard the two names as of the same date and to reject the one and keep up the other in accordance with the author's decision. The name *Tamonea* Aubl. (Verbenaceae) stands without conservation.

The *Tamonea* published in vol. i. is included in the list of nomina rejicienda in favour of *Miconia* Ruiz & Pav. (1794), nomen conservandum.

7143 *Tatea* F. Muell. in Trans. Roy. Soc. S. Austral. vi. 33 (1883)
versus
Tatea Seem. Fl. Vit. 125 (1866).

Tatea F. Muell. Verbenaceae.

Adopted by: Engl. & Prantl, Pflanzenfam. iv. IIIA. 149 (1895); Dalla Torre & Harms, Gen. Siphonog. 430 (1904).—Species 1 from Australia.

Standard species: *T. subacaulis* F. Muell., the type.

Tatea Seem. Rubiaceae.

This genus has been universally reduced to *Bikkia* Reinw. (1826). It had one species only, *T. portlandioides* Seem. See Index Kewensis, ii. p. 1038.

Tatea F. Muell. was a very small genus, one species only, with a restricted distribution. Recently Ewart and Davies, Fl. N. Territory, p. 239 (1917) have reduced *T. subacaulis* F. Muell. to *Avicennia officinalis* L. The name *Tatea* F. Muell., therefore, is not recommended for conservation.

5977 *Tauschia* Schlechtd. in Linnaea, ix. 607 (1835)
versus

Tauschia Preissler in Flora, xi. 44 (1828).

Tauschia Schlechtd. Umbelliferae.

Adopted by: Meissn. Gen. 149 (1838); Endl. Gen. 787, n. 4512 (1839); Spach, Vég. Phan. viii. 138 (1839); Walp. Rep. v. 907 (1846); Benth. & Hook. f. Gen. Pl. i. 882 (1867); Hemsl. Biol. Centr. Amer. i. 563 (1880); Engl. & Prantl, Pflanzenfam. iii. VIII. 170 (1898); Coulter & Rose in Proc. Wash. Acad. Sc. i. 134 (1900); Dalla Torre & Harms, Gen. Siphonog. 368 (1903); K.-Pol. in Bull. Soc. Nat. Mosc. 1914, n.s. xxviii. No. 1, 201 (1915); Macbride in Contrib. Gray Herb. lvi. 28 (1918); T. S. Brandegee in Univ. Calif. Publ. Bot. x. 413 (1924); Pittier,

Man. Pl. Usuales Venez. 299 (1926); Mathias in Ann. Missouri Bot. Gard. xvii. 269 (1930).—From twelve to twenty-two species from Mexico.

Standard species: *T. nudicaulis* Schlechtd., the type.

Tauschia Preissler. Ericaceae.

Preissler included one species in his genus, namely, *T. hederifolia* Preissler, and no one has subsequently added any other. In fact the genus is universally sunk either under *Symphysia* Presl, see Pfeiffer, Nom. Bot. p. 1356, or under *Hornemannia* Vahl, see Index Kewensis, ii. p. 1038; Dalla Torre & Harms, Gen. Siphonog. p. 383, where *Symphysia* Presl is also included under *Hornemannia*; and Post & Kuntze, Lexic. p. 550. When Preissler published the name he regarded it as a genus of Loranthaceae. There appears to be no likelihood whatever of this genus ever being revived.

The genus *Tauschia* Schlechtd., Umbelliferae, is an important genus and very well known. It has been reviewed critically by Coulter & Rose in 1900, when they recognized eleven species. It has also been reviewed by Macbride in 1918 in Contrib. Gray Herb. lvi., and here he enlarges the limits of the genus to include some species of *Musenopsis* (Gray) Coult. & Rose, *Donnell-smithia* Coult. & Rose and *Drudeophytum* Coult. & Rose, and makes ten new transferences, thus bringing up the number of species contained in the genus to about twenty-two.

As the earlier homonym is definitely sunk in synonymy, the writer has no hesitation in recommending the name *Tauschia* Schlechtd. for conservation.

8774 *Telmatophila* Mart. ex Baker in Mart. Fl. Bras. vi. II. 170 (1873)

versus

"*Telmatophila* Ehrh." Beitr. iv. 147 (1789).

Telmatophila Mart. ex Baker. Compositae.

Adopted by: Benth. & Hook. f. Gen. Pl. ii. 236 (1873); Engl. & Prantl, Pflanzenfam. iv. V. 130 (1890); Post & Kuntze, Lexic. 551 (1903); Dalla Torre & Harms, Gen. Siphonog. 526 (1905).—One species from Brazil.

Standard species: *T. scolymastrum* Mart. ex Baker, the type.

"*Telmatophila* Ehrh." Juncaginaceae.

This name was one of Ehrhart's "nomina usualia." These were in effect uninomial specific names suggested for convenience. *Telmatophila* was proposed as a "nomen usuale" for *Scheuchzeria palustris* L. The name is not an earlier homonym of *Telmatophila* Mart. ex Baker and therefore the question of the conservation of the latter does not arise.

7339 *Tetradenia* Benth. in Bot. Reg. t. 1830 (1830), Labiatae versus

2797 *Tetradenia* Nees in Wall. Pl. As. Rar. ii. 61 (1831), Lauraceae.

Both these genera have been kept up by various botanists. According to the Rules, however, the name must be retained for the earlier genus *Tetradenia* Benth., Labiatae.

Tetradenia Nees (1831) has already been correctly renamed by Merrill in Philipp. Journ. Sc. i. Suppl. 56 (1906), as *Neolitsea*, this name being based on *Litsea* § *Neolitsea* Benth. *Tetradenia* Benth., having priority, stands without conservation.

5353 *Tetralix* Griseb. Cat. Pl. Cub. 8 (1866)

versus

Tetralix Hill, Veg. Syst. iv. 18 (1762).

Tetralix [Haller] Zinn, Cat. 202 (1757).

Tetralix Griseb. Flacourtiaceae [Tiliaceae].

Adopted by: Benth. & Hook. f. Gen. Pl. i. 971 (1862–67); Dalla Torre & Harms, Gen. Siphonog. 331 (1903); Urb. Symb. Antill. ix. 231 (1924), where he includes one new species, namely, *T. nipensis*, and places the genus in the family *Tiliaceae*; Gilg in Engl. Pflanzenfam. Aufl. 2, xxi. 457 (1925).—Species two from Cuba.

Standard species: *T. brachypetalus* Griseb., the type.

Tetralix [Haller] Zinn. Ericaceae.

This genus was first described by Haller in a pre-Linnaean work Enum. Stirp. Helv. i. 418 (1742). It was taken up by Zinn and afterwards by E. Meyer, Preuss. Pflanzengatt. 100 (1839), who made one binary combination *Tetralix septentrionalis* based on *Erica Tetralix* L. The genus has been kept up, as far as can be ascertained, only by Lorek, Fl. Pruss. Ed. 3, t. 98, fig. 529 (1848). Indeed, its very existence appears to have been overlooked by most botanists. Up to the present the name has been omitted from the Index Kewensis but it will be included in the current Supplement. It is exceedingly unlikely that the generic name will ever be revived.

Tetralix Hill. Compositae.

A very poorly described genus, which has never been kept up. It is universally sunk under *Cnicus* L. It contained only one species, *T. eriophora*, which is *Cnicus eriophorus*.

The genus *Tetralix* Griseb., Tiliaceae, has very little claim for conservation apart from avoiding any nomenclatural change; it is a small genus with restricted distribution. If the name is not conserved a new name will have to be given, and two new transferences will have to be made. In order to avoid this *Tetralix* Griseb. is here recommended for conservation.

8028 **Tetramerium** Nees in Benth. Bot. Voy. Sulphur, 147, t. 48 (1844)
versus

Tetramerium Gaertn. f. Fruct. iii. 90, t. 196 (1805).

Tetramerium Nees. Acanthaceae.

Adopted by: DC. Prodr. xi. 467 (1847); Seemann, Bot. Voy. Herald, 325, t. 68 (1856); Benth. & Hook. f. Gen. Pl. ii. 1121 (1876); Hemsl. Biol. Centr. Am. Bot. ii. 525 (1882); Engl. & Prantl, Pflanzenfam. iv. IIIB. 331 (1895); Millsp. in Field Columb. Mus., Bot. Ser. i. 47 (1895); Rose in Contrib. U.S. Nat. Herb. i. 349 (1895); Dalla Torre & Harms, Gen. Siphonog. 485 (1905); Robinson & Bartlett in Proc. Amer. Acad. xliii. 58 (1907); Eastwood in Proc. Amer. Acad. xlv. 608 (1909); T. S. Brandegee in Univ. Calif. Publ. Bot. iv. 386 (1913); L. A. M. Riley in Kew Bull. 1925, 229.—About seven species from Central America and Galapagos.

Standard species: *T. polystachyum* Nees.

Tetramerium Gaertn. f. Rubiaceae.

Adopted by: H. B. K. Nov. Gen. iii. 373 (1818); Cham. & Schlechtd. in Linnaea, iv. 29 (1829); Spreng. Gen. i. 90 (1830); Endl. Gen. 534, n. 3154b (1838); Spach, Vég. Phan. viii. 448 (1839).

This is not considered as an independent genus by the majority of botanists, being reduced to *Faramea* Aubl. (1775), see Index Kewensis, ii. 1051; Dalla Torre & Harms, Gen. Siphonog. 506, and Post & Kuntze, Lexic. 504.

Henrya Nees in Benth. Bot. Voy. Sulphur, 148, t. 49 (1844), et in DC. Prodr. xi. 491 (1847), has been considered to be a synonym of *Tetramerium* Nees, Acanthaceae. It is an earlier homonym of *Henrya* Hemsl. (1889), Apocynaceae. Hemsley in Bull. Torr. Bot. Club, xix. 97 (1892) made a new name for the latter, namely, *Neohenrya* Hemsl., stating that American botanists regarded *Henrya* Nees as generically distinct from *Tetramerium*.

If the name *Tetramerium* Nees is not conserved, the correct name for the genus will become *Henrya* Nees for those who consider the two genera synonymous, otherwise a new name must be given to the genus. In order to avoid this, *Tetramerium* Nees is here put forward for conservation.

7510 **Tetranema** Benth. in Bot. Reg. t. 52 (1843)
versus

Tetranema Sweet, Hort. Brit. ed. 2, 149 (1830).

Tetranema Benth. Scrophulariaceae.

Adopted by: Hook. in Bot. Mag. lxx. t. 4070 (1844); Walp. Rep. iii. 251, 961 (1845); Lindl. Veg. Kingd. 684 (1846); DC.

Prodr. x. 331 (1846); Benth. & Hook. f. Gen. Pl. ii. 942 (1876); Regel in Gartenfl. xxxi. 277 (1882); J. D. Smith in Bot. Gaz. xiv. 29 (1889), where he makes one new species, namely, *T. evolutum*; Hemsl. Biol. Centr. Amer. ii. 447 (1882); Engl. & Prantl, Pflanzenfam. iv. IIIB. 66 (1891); J. M. Polak in Oesterr. Bot. Zeitschr. l. 88, t. 3, fig. 27, 28 (1900); Dalla Torre & Harms, Gen. Siphonog. 456 (1904).—Species probably one from Mexico.

Standard species: *T. mexicanum* Benth., the type.

Tetranema Sweet. Leguminosae.

This monotypic genus has never been kept up by any other author. In the Index Kewensis, ii. 1051, and in Dalla Torre & Harms, Gen. Siphonog. p. 238, it is reduced to *Desmodium* Desv. (1813), and in Post & Kuntze, Lexic. p. 554, it is reduced to *Meibomia* Adans., sensu lato, including *Desmodium* Desv.

There is a third similar generic name, namely, *Tetranema* Aresch. in Nov. Act. Upsal. xiv. 418 (1850)—an algal genus. This genus is not kept up, being usually sunk under *Enteromorpha* (see De Toni, Syll. Alg. i. 118: 1889).

The small genus *Tetranema* Benth., Leguminosae, is very restricted in distribution. The case for the conservation of the name lies in the fact that otherwise a new name must be given to the genus. As the earlier homonym has not been kept up, and it is likely that no one would ever wish to revive it, the later homonym *Tetranema* Benth. is here put forward for conservation.

3284 **Thamnea** Soland. ex R. Br. in Abel, Narr. Journ. 374 (1818), nomen; et ex Brongn. in Ann. Sc. Nat. viii. 386, t. 38 (1826)
versus

Thamnia P. Br. Hist. Jam. 245 (1756).

Thamnea Soland. ex Brongn. Bruniaceae.

Adopted by: Reichb. Consp. 160, n. 4229 (1828); G. Don, Gen. Syst. ii. 49 (1832); Spach, Vég. Phan. ii. 476 (1834); Meissn. Gen. 72 (1837); Endl. Gen. 807, n. 4604 (1839); Sond. in Harv. & Sond. Fl. Cap. ii. 324 (1861–2); Benth. & Hook. f. Gen. Pl. i. 671 (1865); Oliv. in Journ. Linn. Soc. ix. 331 (1867); Engl. & Prantl, Pflanzenfam. iii. IIA. 134 (1891); Oliv. in Hook. Ic. Pl. xxiv. t. 2314 (1894); Dalla Torre & Harms, Gen. Siphonog. 204 (1901); Thonner, Blütenpfl. Afr. 253 (1908); Dammer in Journ. Bot. 1912, l. Suppl. 2, 17; Phillips, Gen. S. Afr. Fl. Pl. 289 (1926); Niedenzu & Harms in Engl. Pflanzenfam. Aufl. 2, xviii. 297 (1930).—About seven species from South Africa.

Standard species: *T. uniflora* Soland.

Thamnia R. Br. Flacourtiaceae.

The spellings *Thamnea* and *Thamnia* are looked upon as orthographic variants since both are derived from “*thamnos*” meaning a shrub.

Thamnia P. Br. is not kept up by any botanist; it is a nomen rejiciendum in respect of the conserved name *Laetia* Loeffl. (1758). See International Rules, ed. 3, p. 103.

There is a later synonym available in place of *Thamnea* Sol., Bruniaceae, namely, *Schinzafra* O. Kuntze, Rev. Gen. i. 234 (1891), where four transferences are also made.

However, in view of the almost universal use of *Thamnea* Sol. in all literature concerned with this genus, it is strongly recommended that the name should be conserved, especially as the earlier homonym cannot be used.

***Thorelia** Gagnep. in Lecomte, Not. Syst. iv. 18 (1920)

versus

Thorelia Hance in Journ. Bot. xv. 268 (1877).

Thorelia Gagnep. Compositae.

One species from Indo-China (Laos).

Standard species: *T. montana* Gagnep., the type.

Thorelia Hance, olim incert. sed., jam Myrtaceae.

When Gagnepain created his genus *Thorelia* he pointed out that *Thorelia* Hance, a supposed new genus of Lythraceae was actually identical with *Tristania* R. Br. Myrtaceae. It had up to that time been regarded as a genus of uncertain position, see Dalla Torre & Harms, Gen. Siphonog. 596, where it is placed among "genera incertae sedis." To quote the exact words of Gagnepain: "Un genre *Thorelia* avait déjà été créé par Hance, à propos d'une soi-disant Lythracée. Ce genre n'a pas survécu à un examen de Pierre et de moi; il est devenu synonyme de *Tristania*, une Myrtacée, puisque ce n'est pas autre chose que le *T. merguensis* Griffith. Le nom de *Thorelia* est donc devenu disponible et je suis heureux de saisir l'occasion qui s'offre de le faire rentrer dans la nomenclature, cette fois définitivement, je l'espère."

In view of the above, it seems very desirable to conserve the name *Thorelia* Gagnep.

4733 **Thouinia** Poit. in Ann. Mus. Paris, iii. 70, t. 6 (1804)

versus

Thouinia Linn. f. Suppl. 9, 89 (1781).

Thouinia Sm. Icon. Ined. i. t. 7 (1789).

Thouinia Poit. Sapindaceae.

Adopted by: Pers. Syn. i. 413 (1805); Humb. & Bonpl. Pl. Aequin. i. 198, t. 56 (1808); DC. Prodr. i. 612 (1824); Spreng. Gen. 312, n. 1594 (1830); G. Don, Gen. Syst. i. 671 (1831); Spach, Vég. Phan. iii. 40 (1834); Meissn. Gen. 52 (1837); Griseb. Fl. Brit. West Ind. Isl. 126 (1859); Benth. & Hook. f. Gen. Pl. i. 400 (1862); Engl. & Prantl, Pflanzenfam. iii. V. 311 (1895);

Dalla Torre & Harms, Gen. Siphonog. 295 (1901); Urb. & Radlk. in Urb. Symb. Antill. vii. 275 (1912); Leonard in Journ. Wash. Acad. Sc. 1927, xvii. 69; Radlk. in Arkiv Bot. Stockh. xxia. No. 5, 8 (1927); Radlk. in Engl. Pflanzenreich, Sapindac. 435 (1932).—About twenty-seven species from West Indies, Central America and Mexico.

Standard species: *T. simplicifolia* Poit., the type, and the only one of the original species figured by Poiteau.

Thouinia Linn. f. 1781. Oleaceae.

This is a nomen rejiciendum in respect of *Linociera* Sw. (1791) (see International Rules Bot. Nomencl. ed. 3, 105: 1935).

Thouinia Sm. 1789. Convolvulaceae.

Adopted by: Schreber, Gen. ii. 793 (1791); Willd. Sp. Pl. i. 935, n. 339 (1798)—but almost universally sunk under *Humbertia* Lam., see Index Kewensis ii. 1069, Dalla Torre & Harms, Gen. Siphonog. p. 420 and Post & Kuntze, Lexic. p. 559.

Thouinia Poit. is very well known and is a large genus with a wide distribution. Of the later homonyms *Thouinia* Linn. f. is a nomen rejiciendum, and *Thouinia* Sm. appears very unlikely to be revived.

Thouinia Poit. is recommended for conservation, since failing this a new name must be given to the genus, which would involve many nomenclatural changes.

4239 **Thryallis** "Linn." Mart. Nov. Gen. & Spec. iii. 77, tt. 230, 231 (1829)

versus

Thryallis L. Spec. Pl. ed. 2, 554 (1762).

Thryallis Mart. Malpighiaceae.

Adopted by: Endl. Gen. 1063, n. 5583 (1839); A. Juss. in Ann. Sc. Nat. Sér. II. xiii. 321 (1840); A. Juss. in Walp. Rep. v. 198 (1846); Griseb. in Mart. Fl. Bras. xii. I. 33 (1858); Benth. & Hook. f. Gen. Pl. i. 254 (1862); Niedenzu in Engl. & Prantl, Pflanzenfam. iii. IV. 68 (1890); S. Moore in Trans. Linn. Soc. Ser. II. iv. 324 (1895); Skottsberg in Svensk. Vet. Akad. Handl. n.s. xxxv. No. 6, t. 6, p. 31 (1901); Niedenzu in Engl. Pflanzenreich, Malpighiac. 574 (1928).—Species about five from Brazil.

Standard species: *T. longifolia* Mart., the type.

Thryallis L. Malpighiaceae.

Thryallis L. was based on *Fruticescens herba pisonis* Margr. Bras. 79, f. 3.

Adopted by: Gmelin, Syst. 684 (1791); Willd. Spec. Pl. ii. 570, n. 852 (1799); O. Kuntze, Rev. Gen. i. 88 (1891); Rose in Contrib. U.S. Nat. Herb. xii. 279 (1909); Small in N. Am. Fl. xxv. 150 (1910); Blake in Contrib. Gray Herb. n.s. lii. 71 (1917).

The genus *Thryallis* L. 1762 is universally regarded as congeneric with *Galphimia* Cav. 1799, and *Galphimia* Cav. is kept up by almost all botanists, excluding those mentioned above—see Index Kewensis, ii. p. 1071; Dalla Torre & Harms, Gen. Siphonog. p. 264.

Niedenzu in Engl. Pflanzenreich, Malpighiac. 574 discusses the nomenclature of these two genera. Linné, he states, made an error in his description and described his genus as “monogynous.” Jussieu rejected the name since the type in the Linnean Herbarium was missing, and he has been followed by most subsequent authors, such as Grisebach, Bartling, Bentham, Hooker, Gray and Watson, etc. Cavanilles described three new species under his new genus *Galphimia*. Jussieu realized that the Linnean species cited above was congeneric with these three species and accordingly named it *G. brasiliensis* (L.) Juss. Niedenzu goes on to explain that Martius described the characters of his *Thryallis* and gave excellent descriptions, which shows that there exist two quite distinct genera, *Thryallis* L. 1762 and *Thryallis* Mart. (1829).

Actually Martius did not publish a new genus *Thryallis*, he erroneously placed his two new species in the Linnean genus *Thryallis*, and supplied a new generic description based on new material, therefore *Thryallis* “Mart.” has no status in nomenclature, being a mere misidentification of *Thryallis* L.

The adoption of *Thryallis* L. under the rule of priority, by Gmelin, Willdenow, Kuntze, Rose, Small and Blake, was in strict accordance with the International Rules, ed. 1 (1905).

The adoption of *Thryallis* “Mart.” on the other hand is contrary to a basic principle of all rules of nomenclature, namely, that a wrong identification must not be accepted as a valid name.

The correct name under the rules for this small Brazilian genus is *Hemsleya* Kuntze, Rev. Gen. i. 88 (1891).

Thryallis “Mart.” is not recommended for conservation.

7914 *Thunbergia* Retz. in Phys. Saellsk. Handl. i. 163 (1776)
versus

Thunbergia Montin in Vet. Akad. Handl. Stockh. 288, t. 11 (1773).

Thunbergia Retz. Acanthaceae.

Adopted by: Linn. f. Suppl. 46, n. 1407 (1781); Schreb. Gen. ii. 426, n. 1058 (1791); Gmel. Syst. 934 (1791); Willd. Sp. Pl. iii. 388 (1801); Gaertn. f. Fruct. iii. 22, t. 183 (1805); Pers. Syn. ii. 179 (1807); Endl. Gen. 697, n. 4027 (1839); DC. Prodr. xi. 54 (1847); Benth. & Hook. f. Gen. Pl. ii. 1072 (1876); Engl. & Prantl, Pflanzenfam. iv. IIIB. 291 (1895); Burkill in Dyer, Fl. Trop. Afr. v. 8 (1899); C. B. Clarke in Dyer, Fl. Cap. v. 3 (1901); De Wild. Études Fl. Katanga (Ann. Mus. Congo, Bot. Sér. iv.) i. 134, t. 34, 35 (1903); Dalla Torre & Harms, Gen.

Siphonog. 479 (1904); Engl. & Drude, Veg. der Erde, ix. i. I. 178 (1910); Turrill in Kew Bull. 1912, 361; Lindau in R. E. Fries, Wiss. Ergebn. Schwed. Rhod.-Congo-Exped. 1911-12, i. 302 (1916); L. H. Bailey, Stand. Cycl. Hort. 3337 (1917); Merrill in Philipp. Journ. Sc. 1922, xxi. 510; Craib in Kew Bull. 1926, 172; De Wild. Pl. Bequaert. iv. 418 (1928); S. Moore in Journ. Bot. 1929, lxvii. 227.—Over 100 species from Tropical Africa, Asia and Australia.

Standard species: *T. capensis* Retz., the type.

Thunbergia Montin. Rubiaceae.

This genus has not been kept up, as far as can be ascertained, by any botanist; it is reduced to *Gardenia*.

The universally accepted name *Thunbergia* Retz., Acanthaceae, is very strongly recommended for conservation—it is so very well known—the type of the tribe *Thunbergieae*—that the necessity for conserving it need not be dwelt upon, especially as the earlier homonym is never kept up.

238 *Thurberia* Benth. in Journ. Linn. Soc. xix. 58 (1881)

versus

Thurberia A. Gray in Mem. Amer. Acad. n.s. v. 308 (1855).

Synonyma priora rejicienda:—

Greenia Nutt. in Trans. Amer. Phil. Soc. v. 142 (1837).

Sclerachne Torr. ex Trin. in Mém. Acad. St. Petersb. Sér. VI. vi. 273 (1845).

Thurberia Benth. Gramineae.

Adopted by: Benth. & Hook. f. Gen. Pl. iii. 1118 (1883); Engl. & Prantl, Pflanzenfam. ii. II. 50 (1887); Benth. ex Vasey, Illustr. N. Amer. Grasses, i. I. t. 9 (1890); Hackel, True Grasses, 110 (1896); Dalla Torre & Harms, Gen. Siphonog. 18 (1900).—Species one from Texas and Arkansas.

Standard species: *T. arkansana* Benth., the type.

Thurberia A. Gray. Malvaceae.

Adopted by: Tidestrom in Proc. Biol. Soc. Wash. xl. 120 (1927).

Most authors regard *Thurberia* A. Gray as *Gossypium* L. (see Index Kewensis, ii. 1072) or as *Ingenhouzia* Moc. & Sessé (see Dalla Torre & Harms, Gen. Siphonog. p. 309).

As far as the earlier synonyms of *Thurberia* Benth. are concerned, the following is the position. *Greenia* Nutt. (1837) is a phonetic homonym of *Greenia* Wight & Arn. (1834), a name which is kept up.

Sclerachne Torr. & Gray is a later homonym of *Sclerachne* R. Br. (1838) which name is also kept up.

There is also a later synonym of *Thurberia* Benth., namely, *Limnodea* Dewey in Contrib. U.S. Nat. Herb. ii. 518 (1894), and this is the correct name for the genus under International Rules, unless *Thurberia* Benth. is conserved.

Limnodea L. H. Dewey has been adopted by several botanists, such as: Hitchcock in U.S. Dept. Agric., Bull. 772, p. 135 (1920); Bews, World Grasses, 200 (1929); Silveus, Texas Grasses, 221 (1933); Hitchcock, Man. Grasses, U.S. 880 (1935).

Thurberia Benth. is a small genus for which the correct name *Limnodea* L. H. Dewey has been used by many botanists.

Thurberia A. Gray is the correct name for the Malvaceous genus commonly known as *Ingenhouzia* Moc. & Sessé, non aliorum, and has been adopted by Tidestrom as recently as 1927, see above.

The generic name *Thurberia* Benth., therefore, is not put forward for conservation.

9289 **Thymopsis** Benth. in Benth. & Hook. f. Gen. Pl. ii. 407 (1873)

versus

Thymopsis Jaub. & Spach, Illustr. Pl. Or. i. 72, t. 37 (1843).

Thymopsis Benth. Compositae.

Adopted by: Urban in Jahrb. Bot. Gart. Berlin, iv. 251, t. 2, fig. 9-14 (1886); O. Hoffmann in Engl. & Prantl, Pflanzenfam. iv. V. 260 (1890); Dalla Torre & Harms, Gen. Siphonog. 555 (1905); Greenman in Bull. New York Bot. Gard. iii. 453 (1905), where he makes a new species *T. Brittonii* Greenman from the Bahama Islands.—Species probably two from Cuba and Bahama Islands.

Standard species: *T. Wrightii* Benth., the type.

Thymopsis Jaub. & Spach. Hypericaceae.

Adopted by: Walp. Rep. v. 142 (1846). It contained only one species. The genus and its one species has been almost universally reduced to *Hypericum Thymopsis*, Boiss. see Index Kewensis, ii. 1073; Dalla Torre & Harms, Gen. Siphonog. p. 319, and Post & Kuntze, Lexic. p. 560.

The genus *Thymopsis* Benth. is a small one and has a limited distribution. In itself it perhaps has no claim for conservation, but since a new name would have to be found for the genus and since the earlier homonym seems very unlikely to be revived, in order to save any nomenclatural change the name *Thymopsis* Benth. is here put forward for conservation.

3285 **Tittmannia** Brongn. in Ann. Sc. Nat. viii. 385 (1826)

versus

Tittmannia Reichb. Ic. Exot. i. 26, t. 38 (1824).

Tittmannia Brongn. Bruniaceae.

Adopted by: G. Don, Gen. Syst. ii. 49 (1832); Endl. Gen. 807, n. 4603 (1839); Sond. in Harv. & Sond. Fl. Cap. ii. 312 (1861-2); Benth. & Hook. f. Gen. Pl. i. 671 (1865); Niedenzu in Engl.

& Prantl, Pflanzenfam. iii. IIA. 134 (1890); Dalla Torre & Harms, Gen. Siphonog. 204 (1901); Dummer in Journ. Bot. 1912, 1. Suppl. 2, p. 16; Phillips, Gen. S. Afr. Fl. Pl. 289 (1926); Niedenzu & Harms in Engl. Pflanzenfam. Aufl. 2, xviii. 298 (1930).—Three species from South Africa.

Standard species: *T. lateriflora* Brongn., the correct name for which is *T. laxa* (Thunb.) Presl, the type species.

Tittmannia Reichb. Scrophulariaceae.

This genus although adopted by Spreng. Gen. ii. 490 (1831) is regarded by almost all botanists as identical with *Vandellia*. De Candolle keeps up the name as a section of *Vandellia*, see DC. Prodr. x. 413 (1846). The genus is reduced in Index Kewensis, ii. 1085; Dalla Torre & Harms, Gen. Siphonog. 459, and in Post & Kuntze, Lexic. 562. It does not seem very likely that botanists in the future will wish to restore the genus to independent rank.

Tittmannia Brongn. has a later synonym in *Moesslera* Reichb. Consp. 160 (1828), and one transference has already been made, namely, *Moesslera latiflora* Eckl. & Zeyh. Enum. 142.

Although *Tittmannia* Brongn. is only a small genus, the name has been almost always adopted in literature dealing with the genus, so perhaps for that reason alone, if for nothing else, it would be well to conserve the generic name.

***Tonduzia** Pittier in Contrib. U.S. Nat. Herb. xii. 103 (1908) and

Tonduzia Boeck. ex Tonduz in Bull. Herb. Boiss. iii. 464 (1895), nomen.

Tonduzia Pittier. Apocynaceae.

A genus of three species from Guatemala. The name *Tonduzia* Boeck. is invalid as it appeared with no description whatever, and as such it need not be considered. It is, moreover, always considered as a synonym of *Durandia* Boeck.

The name *Tonduzia* Pittier stands without conservation.

17 **Torreya** Arn. in Ann. Nat. Hist. i. 130 (1838)

versus

Torreya Rafin. in Amer. Monthly Mag. 356 (1818).

Torreya Rafin. in Journ. de Phys. lxxxix. 105 (1819).

Torreya Spreng. Neue Entdeck. ii. 121 (1821).

Torreya Eaton, Man. Bot. N. Amer. ed. 7, 560 (1836).

Torreya Croom ex Meissn. Gen. Pt. 2, 340 (1843).

Torreya Arn. Taxaceae.

Adopted by: Endl. Gen., Suppl. 1, 1373, n. 1798/1 (1840); Spach, Vég. Phan. xi. 297 (1842); Hook. in Bot. Mag. t. 4780 (1854), where Hooker gives also an amended description;

Parlatore in DC. Prodr. xvi. II. 504 (1868); Benth. & Hook. f. Gen. Pl. iii. 431 (1880); Eichler in Engl. & Prantl, Pflanzenfam. ii. I. 111 (1889); Dalla Torre & Harms, Gen. Siphonog. 2 (1900); Pilger in Engl. Pflanzenreich, Taxac. 105 (1903); Jepson, Fl. Calif. Pt. 1, 64 (1909); Clinton-Baker, Ill. Conif. iii. 60 (1913); Bean, Trees & Shrubs, ii. 597 (1921); Jepson, Fl. Econ. Pl. Calif. 30 (1924); Chun in Journ. Arn. Arb. vi. 144 (1925); Pilger in Engl. Pflanzenfam. Aufl. 2, xiii. 211 (1926); Rehder, Man. Cult. Trees and Shrubs, 4 (1927); Doi & Morikawa in Bot. Mag., Tokyo, xlii. 536 (1928).—From 5–7 species from China and Japan, California and Florida.

Standard species: *T. taxifolia* Arn., the type.

Of the many later homonyms, all are very little known, and none is kept up. The following list shows to what genus each is reduced:

Torreya Rafin. (1818) = *Synandra* Nutt. (1818).

Torreya Rafin. (1819) = *Cyperus* L. (1753).

Torreya Spreng. (1821) = *Clerodendron* L. (1753).

Torreya Eaton (1836) = *Mentzelia* L. (1759).

Torreya Croom (1842) = *Croomia* Torr. & Gray (1840).

None of these reduced genera is likely to be reinstated.

It is true, *Torreya* Arn., Taxaceae, has some later synonyms, the earliest of which is *Tumion* Rafin. Amenities of Nature, 63 (1840), and in the Index Kewensis some transferences from *Torreya* Arn. are recorded as having been made by E. L. Greene. Pilger in Engl. Pflanzenreich, however, is unable to give any information concerning this Rafinesque genus.

It will be seen from the bibliography given above that *Torreya* Arn. is very generally adopted by past and present botanists, and as it is such a well-known genus, the writer has no hesitation in recommending the generic name for conservation.

3081 **Tovaria** Ruiz & Pav. Fl. Peruv. et Chil. Prodr. 49, t. 8 (1794)

versus

Tovaria Neck. Elem. iii. 190 (1790).

Tovaria Ruiz & Pav. Tovariaceae.

Adopted by: Pers. Syn. i. 402 (1805); Spreng. Gen. i. 296 (1830); G. Don, Gen. Syst. i. 285 (1831); Endl. Gen. 894, n. 5006 (1839); Benth. & Hook. f. Gen. Pl. i. 110 (1862); Engl. & Prantl, Pflanzenfam. iii. II. 208 (1891); Dalla Torre & Harms, Gen. Siphonog. 192 (1900); Fawcett & Rendle, Fl. Jam. iii. I. 246 (1914); Engl. & Gilg, Syll. Pflanzenfam. 218 (1924).—Species one from West Indies and Trop. South America.

Standard species: *T. pendula* Ruiz & Pav., the type.

Tovaria Neck. Liliaceae.

Tovaria Neck. is on the list of nomina rejicienda as *Smilacina*

Desf. (1807) is conserved against it, see International Rules, ed. 3, 92 (1935).

It appears to have been overlooked on many occasions that *Tovaria* Neck. is a nomen rejiciendum, as the name has been kept up by many botanists even as recently as Krause in Engl. & Prantl, Pflanzenfam. Aufl. 2, xva. 367 (1930). This name, however, must be rejected.

Tovaria Ruiz & Pav. is the type genus of the family Tovariaceae. It is very well known, and although there are two later names (synonyms), neither is available, namely, *Cavaria* Steud. Nom. ed. 1, 169 (1821) *nomen*, and *Bancroftia* Macf. Fl. Jam. i. 112 (1837) itself a later homonym of *Bancroftia* Billb. (Umbellif.) 1833. It seems very desirable to conserve *Tovaria* Ruiz & Pav. as the genus is the type of the family name Tovariaceae.

4336 **Toxicodendrum** Thunb. in Vet. Akad. Handl. Stockh. 188, t. 7 (1796)

versus

Toxicodendron Gaertn. Fruct. i. 207, t. 44 (1788).

Toxicodendron [Tourn.] Mill. Gard. Dict. Abridg. ed. 4 (1754).

Toxicodendrum Thunb. Euphorbiaceae.

Adopted by: Willd. Spec. Pl. iv. 821, n. 1823 (1806); Spreng. Syst. ii. 460 (1825); Benth. & Hook. f. Gen. Pl. iii. 280 (1880); Pax in Engl. & Prantl, Pflanzenfam. iii. V. 32 (1890); Dalla Torre & Harms, Gen. Siphonog. 272 (1901); Hutchinson in Fl. Cap. v. II. 408 (1920); Pax & K. Hoffm. in Engl. Pflanzenreich, Euphorb.-Phyllanthoid.-Phyllanth. 284 (1922); Phillips, Gen. S. Afr. Fl. Pl. 369 (1926).—Species one from S. Africa.

Standard species: *T. capense* Thunb. = *T. globosum* (Gaertn. f.) Pax & K. Hoffm., the type species.

Toxicodendron Gaertn. Sapindaceae.

This genus which included one species, namely *T. cobbe*, appears to have been sunk by all botanists for all time. In the Kew Index it is reduced to *Allophylus* L., Dalla Torre & Harms make the same reduction and so do Post & Kuntze. Pfeiffer in his Nomencl. p. 1435 reduces the genus to *Schmidelia* L., and Radlkofer in Engl. Pflanzenreich, Sapindac. 456 (1932) reduces the genus to *Allophylus* L.

Toxicodendron [Tourn.] Mill. Anacardiaceae.

Adopted by: Mill. Gard. Dict. ed. 8 (1768); Britton & Brown, Ill. Fl. N. States & Canada, ed. 2, ii. 483 (1913); and in Kuntze, Rev. Gen. i. 153–154 (1891), Kuntze transfers all the species of *Rhus* (1753) known to him to the genus *Toxicodendron* L., (1735) [Mill.] but no one has followed his example.

If the generic name *Toxicodendrum* Thunb. (Euphorbiaceae) is not conserved it becomes *Hyaenanche* Lamb., and the species, *H. globosa* (Gaertn. f.) Lamb., and thus no new names would have to be made.

As *Toxicodendron* Mill., *sensu stricto*, is sometimes regarded as an independent genus, by those who accept small genera, the later homonym is not put forward for conservation.

8100 **Trichocalyx** I. B. Balf. in Proc. Roy. Soc. Edinb. xii. 87 (1884)

versus

Trichocalyx Schau. in Nov. Act. Acad. Nat. Cur. xix. Suppl. II. 238 (1841).

Trichocalyx I. B. Balf. Acanthaceae.

Adopted by: I. B. Balf. in Trans. Roy. Soc. Edinb. xxxi. 221 (1888); Engl. & Prantl, Pflanzenfam. iv. IIIB. 352 (1895); Post & Kuntze, Lexic. 568 (1903); Dalla Torre & Harms, Gen. Siphonog. 488 (1905).—Species two from Socotra.

Standard species: *T. obovatus* I. B. Balf., the type.

Trichocalyx Schau. Myrtaceae.

Trichocalyx Schau. was a superfluous name for *Calytrix* Labill. (1806) and must therefore be rejected. It has been reduced to *Calytrix* Labill. in Index Kewensis, ii. 1105; in Dalla Torre & Harms, Gen. Siphonog. 351, and in Post & Kuntze, Lexic. 568 (1903).

Trichocalyx Balf. f. is a small genus and has a very limited distribution. As, however, the earlier homonym cannot be revived and there is no other available name for this genus, it is proposed that *Trichocalyx* Balf. f. should be conserved.

8397 **Trichostachys** Hook. f. in Benth. & Hook. f. Gen. Pl. ii. 128 (1873)

versus

Trichostachys Welw. Synops. 19 (1862).

Trichostachys Hook. f. Rubiaceae.

Adopted by: Hiern in Oliv. Fl. Trop. Afr. iii. 227 (1877); Engl. & Prantl, Pflanzenfam. iv. IV. 112 (1891); K. Schum. in Engl. Jahrb. xxiii. 467 (1897), xxviii. 88 (1899), xxxiii. 360 (1903); Dalla Torre & Harms, Gen. Siphonog. 502 (1905); De Wild. Études Fl. Bas- et Moyen-Congo (Ann. Mus. Congo, Bot. Sér. v.) ii. 86, t. 14 (1907); Thonner, Blütenpfl. Afr. 556 (1908); Wernham, Cat. Talbot's Niger. Pl. 55 (1913); Hutchinson & Dalziel, Fl. W. Trop. Afr. ii. I. 126 (1931).—About 12 species from Tropical Africa.

Standard species: *T. longifolia* Hiern, one of the four original species.

Trichostachys Welw. Proteaceae.

This genus has always been considered as reduced to *Faurea*.

It has only one species=*Faurea speciosa*. See Index Kewensis, ii. 1110; and Dalla Torre & Harms, Gen. Siphonog. p. 126.

The genus *Trichostachys* Hook. f. is universally kept up, and its earlier homonym *Trichostachys* Welw. has always been reduced. There is no later name available for *Trichostachys* Hook. f., so to save making a new name and many transferences, the name *Trichostachys* Hook. f. is here proposed for conservation.

7392 **Triguera** Cav. Diss. ii. App. p. I. t. A. (1786)

versus

Triguera Cav. Diss. i. 41, t. 11 (1786).

Triguera Cav. (1786). Solanaceae.

Adopted by: Willd. Sp. Pl. i. 839 (1798); Juss. Gen. 125 (1789); Schreb. Gen. i. 114, n. 282 (1789); Pers. Syn. i. 218 (1805); Roem. & Schult. Syst. iv. 698, n. 838 (1819); Endl. Gen. 168, n. 3874 (1839); Miers in Hook. Kew Gard. Misc. i. 65 (1849); Dunal in DC. Prodr. xiii. I. 21 (1852); Benth. & Hook. f. Gen. Pl. ii. 897 (1876); Battand. & Trabut, Fl. Algér. 619 (1890); Engl. & Prantl, Pflanzenfam. iv. IIIB. 16 (1891); Willkomm, Suppl. Prodr. Fl. Hispan. 169 (1893); Dalla Torre & Harms, Gen. Siphonog. 449 (1904); Lázaro é Ibiza, Comp. Fl. Espan. ii. 513 (1907); Battandier, Contrib. Fl. Atlant. 63 (1919).—Two species from Spain and Algeria.

Standard species: *T. ambrosiaca* Cav.

Triguera Cav. (1785). Malvaceae.

This genus is almost universally sunk under *Hibiscus*, see Index Kewensis, Suppl. ii. 1118, where the genus and the one species included in it are referred to *Hibiscus* and *H. Solandra*. Dalla Torre & Harms, Gen. Siphonog. 309, and Post & Kuntze, Lexic. 572 (1903), also reduce it to *Hibiscus*.

As the genus *Triguera* Cav., Malvaceae, is never likely to be reinstated as an independent genus, and as there is no other available name for *Triguera* Cav. (Solanaceae), it seems advisable, in order to avoid any changes in nomenclature, to conserve the latter name. The genus is included in almost all literature dealing with the flora of the area.

The generic name *Triguera* Cav., Solanaceae, is therefore proposed for conservation.

5022A. **Triplochiton** K. Schum. in Engl. Bot. Jahrb. xxviii. 330 (1900)

versus

Triplochiton Alef. in Oesterr. Bot. Zeitschr. xiii. 13 (1863).

Triplochiton K. Schum. Sterculiaceae.

Adopted by: Dalla Torre & Harms, Gen. Siphonog. 309 (1901); C. H. Wright in Hook. Ic. Pl. xxviii. t. 2758 (1903); Prain in Journ. Linn. Soc., Bot. xxxvii. 255 (1905) where he adopts the genus but does not recognize the family *Triplochitonaceae*; he refers the genus to the tribe *Mansonieae* of the family *Sterculiaceae*; Engl. & Prantl, Pflanzenfam. Nachtr. iii. 216 (1907); Sprague in Kew Bull. 1909, 212; Unwin, W. Afr. Forests & Forestry, 19, 76, 106 etc. (1920); Hutchinson & Dalziel, Fl. W. Trop. Afr. i. 248 (1928); Edlin in New Phyt. xxxiv. 11 (1935), where he includes it in the family *Buettneriaceae*; Milne-Redhead in Kew Bull. 1935, 271.—About three species from West Africa and Rhodesia.

Standard species: *T. scleroxylon* K. Schum.

Triplochiton Alef. Malvaceae.

This genus and its two species are almost universally reduced to *Hibiscus* L.—see Index Kewensis, ii. 1122; Dalla Torre & Harms, Gen. Siphonog. p. 309, and Post & Kuntze, Lexic. p. 574, where the authors reduce *Triplochiton* Alef. to *Hibiscus* L. and recognize *Triplochiton* K. Schum. as the type genus of the family *Triplochitonaceae*.

The genus *Triplochiton* K. Schum. is very important from an economic standpoint. The name most certainly should be conserved. It has been considered by some authors as the type genus of the independent family *Triplochitonaceae* but most authors include it in the family *Sterculiaceae*.

The earlier homonym has always been regarded as a synonym and it seems unlikely that it will ever be revived.

The name *Triplochiton* K. Schum., therefore, is now proposed for conservation.

9428 *Tripteris* Less. in Linnaea, vi. 95 (1831)

versus

Tripteris Thunb. Dec. Pl. Bras. i. 14 (1817).

Tripteris Less. Compositae.

Adopted by: DC. Prodr. vi. 456 (1837); Endl. Gen. 462, n. 2824 (1838); Meissn. Gen. 222 (1839); Spach, Vég. Phan. x. 15 (1841); Harvey & Sond. Fl. Cap. iii. 424 (1864-5); Benth. & Hook. f. Gen. Pl. ii. 455 (1873); Oliv. in Fl. Trop. Afr. iii. 423 (1877); Hoffm. in Engl. & Prantl, Pflanzenfam. iv. V. 306 (1892); Dalla Torre & Harms, Gen. Siphonog. 565 (1906); Black, Native Fl. S. Austral. 87 (1909); R. E. Fries, Schwed. Rhod.-Kong.-Exped. 1911-12, Bot., i. 346 (1916); Mattf. in Engl. Jahrb. lix. Beibl. 133, 44 (1924); Phillips, Gen. S. Afr. Fl. Pl. 675 (1926); Levyns, Guide Fl. Cap. Penins. 267 (1929); Black, Fl. S. Austral. 614 (1929).—Species about 35 mostly from Tropi-

cal & South Africa, a few in Australia, Brazil and the island of Socotra.

Standard species: *T. arborescens* (Jacq.) Nees.

Tripteris Thunb. Malpighiaceae.

This was an orthographic "correction" of the badly formed name *Triopteris* L. 1753. Such corrections on purely etymological grounds are prohibited by Art. 59.

The spelling *Tripteris* Thunb. is scarcely ever used, it is almost always written as *Triopteris* L. 1753.

The genus *Tripteris* Less. is very well known in South Africa and appears in almost all floras dealing with the area. The name is here definitely proposed for conservation.

9601 *Troximon* ["Gaertn."] Nutt. in Fraser, Cat. 83, 84 (1813); Pursh. Fl. Am. Sept. ii. 505, 742 (1814)

versus

Troximon Gaertn. Fruct. ii. 360 (1791).

Troximon ["Gaertn."] Nutt. Compositae.

Adopted by: Nuttall, Gen. Amer. ii. 127 (1818), who attributes the name to Gaertner; Endl. Gen. 495, n. 2982 (1838); Hook. Fl. Bor. Am. i. 300, t. 104 (1833), where Hooker quotes as author of the genus "Nuttall an Gaertn.?" ; DC. Prodr. vii. I. 251 (1838); Torr. & Gray, N. Am. Fl. ii. 489 (1843); Benth. & Hook. f. Gen. Pl. ii. 522 (1873); Hoffm. in Engl. & Prantl, Pflanzenfam. iv. V. 373 (1893); Greene in Pittonia, ii. 78 (1890); Dalla Torre & Harms, Gen. Siphonog. 581 (1906); A. Nelson, New Man. Bot. Centr. Rocky Mts. 598 (1909); Reiche, Fl. Chile, v. 43 (1910).—About twenty-five species from N. America and Chile.

Standard species: *T. glaucum* Pursh, the only one of the two original species retained within the genus.

Troximon Gaertn. Compositae.

According to the Index Kewensis this genus was not well made—"Genus male factum"—and it is reduced partly to *Scorzonera* L. 1753 and partly to *Krigia* Schreb. 1791. The same reductions are made by Dalla Torre & Harms, Gen. Siphonog. pp. 577, 579.

The genus *Troximon* Nutt., non Gaertn. has more than one later synonym and if the name is not conserved it will become:—*Agoseris* Raf. Fl. Ludov. 58 (1817).

This name has been adopted instead of *Troximon* Nutt. by the following:—Eastwood in Bull. Torr. Bot. Cl. 1903, 501; Macloskie in Rep. Princeton Univ. Exped. Patag. viii. 902 (1906); S. Brown, Alp. Fl. Rocky Mts. 276 (1907); Clements & Clements, Rocky Mt. Fl. 251 (1914); Piper & Beattie, Fl. N. W. Coast, 355 (1915); M. Armstrong, Field Book West. Wild Fl. 572

(1915); Fernald in *Rhodora*, 1924, xxvi. 125; Jepson, *Man. Fl. Pl. Calif.* 1004 (1925); Rydberg, *Fl. Prairies and Plains N. Amer.* 896 (1932).

In view of the fact that so many botanists have used the correct name under the rules for *Troximon* Nutt., non Gaertn. it would appear very inadvisable to conserve *Troximon* Nutt.

1047 *Tulbaghia* L. Mant. ii. 148 (1771)

versus

Tulbaghia Heist. Descr. Nov. Gen. Brunsvig. p. x. (1753), in obs., et in adnot.; et Besch. Brunsvig. 15 (1753), in obs., et in adnot.

Tulbaghia L. Liliaceae.

Adopted by: Gaertn. *Fruct.* i. 57 (1788); Willd. *Sp. Pl.* ii. 33 (1799); Pers. *Syn.* i. 349, n. 779 (1805); Bot. Mag. xxi. t. 806 (1805); Spreng. *Gen.* i. 255 (1830); Endl. *Gen.* 150, n. 1159 (1836); Bot. Mag. lxiv. t. 3547 (1837); Kunth, *Enum. Pl.* iv. 480 (1843); Spach, *Vég. Phan.* xii. 255 (1846); Benth. & Hook. f. *Gen. Pl.* iii. 798 (1883); Engl. in Engl. & Prantl, *Pflanzenfam.* ii. V. 54 (1888); Baker in Dyer, *Fl. Cap.* vi. 403 (1897); Wood & Evans, *Natal Pl.* i. I. t. 29, p. 26 (1898); Baker in Dyer, *Fl. Trop. Afr.* vii. 514 (1898); Dalla Torre & Harms, *Gen. Siphonog.* 65 (1900); N. E. Brown in *Kew Bull.* 1901, 136; De Wild. in *Fedde, Repert.* xi. 546 (1913); Glover in *Ann. Bolus Herb.* i. 104 (1915); R. E. Fries, *Wiss. Ergebn. Schwed. Rhod.-Congo-Exped.* 1911-12, i. 227 (1916); Phillips, *Gen. S. Afr. Fl. Pl.* 150 (1926); Levyns, *Guide Fl. Cape Penins.* 61 (1929); Krause in *Engl. Pflanzenfam. Aufl.* 2, xva. 318 (1930).—Species 12-14 from tropical and south Africa.

Standard species: *T. capensis* L., the type.

Tulbaghia Heist. Liliaceae.

This generic name is on the list of nomina rejicienda, *Agap-anthus* L'Hérit. (1788) being conserved against it (see International Rules, ed. 3, 92: 1935).

Tulbaghia L., named after Tulbagh, was originally spelt by Linné "*Tulbagia*." Almost all botanists have adopted the spelling *Tulbaghia*, and it seems reasonable to conserve the name with that spelling. The generic name most certainly should be conserved, the genus being well known in tropical and South Africa, and the name adopted in almost all floras.

7139 *Urbania* Phil. Verz. Pfl. Antofagasta u. Tarap. 60 (1891)

versus

Urbania Vatke in Oesterr. Bot. Zeitschr. xxv. 10 (1875).

Urbania Phil. Verbenaceae.

Adopted by: Post & Kuntze, *Lexic.* 581 (1903); Dalla Torre & Harms, *Gen. Siphonog.* 430 (1904); Reiche, *Fl. Chile*, v. 296

(1910).—Two species from Chile.

Standard species: *U. pappigera* Phil.

Urbania Vatke. Scrophulariaceae.

As far as can be ascertained, this genus has been kept up by no one. Index Kewensis, ii. 1149, reduces it to *Lyperia* Benth. and Dalla Torre & Harms, *Gen. Siphonog.* p. 457, reduce both *Urbania* Vatke and *Lyperia* Benth. (1835) to *Chaenostoma* Benth. (1835).

Urbania Phil. (1891) is a small genus consisting of only two species, with a limited distribution. It has no later available name, and since the earlier homonym has never been kept up, it seems reasonable to conserve the later homonym in order to avoid any nomenclatural change.

Urbania Phil., therefore, is here proposed for conservation.

6639 *Urceola* Roxb. in Asiat. Research. v. 169 (1798)

versus

Urceola Vand. Fl. Lusit. & Bras. Spec. 8, t. 1, f. 4 (1788); Roem. & Schult. *Syst.* iii. 99 (1818).

Urceola Quelet, *Ench. Fung.* 1886, 320.

Urceola Roxb. Apocynaceae.

Adopted by: Pers. *Syn.* i. 269 (1805); Endl. *Gen.* 581, n. 3395 (1838); Spach, *Vég. Phan.* viii. 518 (1839); Wight, *lc. Pl. Ind. Or.* ii. II. p. (5), t. 473 (1840-43); DC. *Prodr.* viii. 358 (1844); Benth. & Hook. f. *Gen. Pl.* ii. 716 (1876); Kurz, *For. Fl. Brit. Burma*, ii. 183 (1877); Hook. f. *Fl. Brit. Ind.* iii. II. 657 (1882); K. Schum. in Engl. & Prantl, *Pflanzenfam.* iv. II. 163 (1895); Boerl. in *Bull. Inst. Buitenz.* v. 16 (1900); Dalla Torre & Harms, *Gen. Siphonog.* 408 (1904); King & Gamble in *Journ. As. Soc. Beng.* lxxiv. 472 (1908); Ridley, *Fl. Mal. Penins.* ii. 356 (1923).—Species about seven from India and Malaya.

Standard species: *U. elastica* Roxb.

Urceola Vand. (1788).

This genus is very obscure. The Index Kewensis, ii. 1149, records it as *Urceola* Vand. Quid? It records also one species *U. Vandelli* Roem. & Schult. *Syst.* iii. 99 (1818). These authors themselves remark "*Nuspam alibi descripta aut saltem adducta.*"

Dalla Torre & Harms, *Gen. Siphonog.* p. 586, place the genus amongst their "*Genera incertae sedis*," and Post & Kuntze, *Lexic.* p. 581, keep up *Urceola* Roxb., Apocynaceae, and for *Urceola* Vand. they state that the genus is not sufficiently known.

Urceola Quélet is a genus of fungi which was sunk by Saccardo in *Pyrenopeziza* Fuck.

The genus *Urceola* Roxb. is very well known and the name occurs in almost all literature dealing with the floras of India and Malaya. There is a later synonym, namely, *Chavannesia* A.DC. in DC. Prodr. viii. 444 (1844), and if *Urceola* Roxb. is not conserved, the genus will become *Chavannesia* A.DC., and many new transferences will have to be made. Since the earlier homonym still remains a mystery, and never has been kept up, and in order to avoid any further nomenclatural change, the generic name *Urceola* Roxb., Apocynaceae, is here recommended for conservation.

1178 *Vallota* Herb. App. Bot. Reg. 29 (1821).
Valota Adans. Fam. ii. 495 (1763).
Vallota Steud. Nom. ed. 2, ii. 744 (1841).

Vallota Herb. Amaryllidaceae.

Adopted by : Herb. in Bot. Mag. lii. App. p. iv. (1825) ; Reichb. Consp. 61 (1828) ; Dumort. Anal. Fam. 58 (1829) [*Valota*] ; Endl. Gen. 176, n. 1273f. (1837) ; Kunth, Enum. v. 531 (1850) ; Benth. & Hook. f. Gen. Pl. iii. 729 (1883) ; Pax in Engl. & Prantl, Pflanzenfam. ii. V. 106 (1888) ; Baker in Dyer, Fl. Cap. vi. 217 (1896) ; Dalla Torre & Harms, Gen. Siphonog. 74 (1900) ; L. H. Bailey, Stand. Cycl. Hort. 3428 (1917) ; Phillips, Gen. S. Afr. Fl. Pl. 162 (1926) ; Hutchinson, Fam. Fl. Pl. ii. 134 (1934).—Species one from S. Africa.

Standard species : *V. purpurea* Herb., the type=*V. speciosa* (L.f.) Voss.

Valota Adans. Gramineae.

The Index Kewensis, ii. 1168, records no species and reduces the genus to *Panicum*.

Vallota Steud. is merely an orthographic variant of *Valota* Adans., and is similarly reduced to *Panicum* L.

Of recent years, however, certain American botanists have revived this genus, namely, Chase in Proc. Biol. Soc. Wash. xix. 186 (1906), et l.c. xxiv. 110 (1911) ; Hitchcock & Chase in Contrib. U.S. Nat. Herb. xviii. 291 (1917).

Standard species : *V. insularis* (L.) Chase.

Vallota Herb. is a well known horticultural genus. Herbert does not state after whom the genus is named, nor does Adanson give the derivation of his name *Valota*. Since the derivation of both these names is uncertain *Valota* Adans. cannot be treated as an earlier homonym of *Vallota* Herb. This latter name, therefore, may be retained for the horticultural genus of Amaryllidaceae containing the well-known "Scarborough Lily," and *Valota* Adans. may be retained for the genus of Gramineae.

**Vaupelia* Brand in Fedde, Repert. xiii. 82 (1914)
 versus

Vaupellia Griseb. Fl. Brit. W. Ind. 460 (1861).

Vaupelia Brand Boraginaceae.

This genus contains about seven species of which *Vaupelia barbata* (Vaupel) Brand may be taken as the standard.

Vaupellia Griseb. Gesneriaceae.

The author does not indicate after whom the genus was named. Perhaps the names *Vaupelia* and *Vaupellia* should not be regarded as homonyms. If they are, however, *Vaupelia* Brand is put forward for conservation as *Vaupellia* Griseb. appears to be universally sunk. In Index Kewensis, ii. p. 1172, it is reduced to *Pentarhaphia* Lindl. (= *Gesneria* L.) and the one species *V. calycina* transferred to *Pentarhaphia calycina*. Dalla Torre & Harms, Gen. Siphonog. p. 477, reduce both *Vaupellia* and *Pentarhaphia* to *Gesneria* L. 1753.

Vaupelia Brand (Boraginaceae) is recommended for conservation if regarded as a later homonym.

4599 *Veatchia* A. Gray in Bull. Calif. Acad. i. no. 1, p. 4 (1884)
 versus

Veatchia Kellogg in Proc. Calif. Acad. 1859, ii. 11 (1863).

Veatchia A. Gray. Anacardiaceae.

Adopted by : A. Gray in Proc. Amer. Acad. xx. 290 (1885) ; T. S. Brandegee in Proc. Calif. Acad. Ser. II. ii. 140 (1889), where he makes a new species *V. discolor*, subsequently reduced to *Schinus discolor* Benth. ; Engl. in Engl. & Prantl, Pflanzenfam. iii. V. 174 (1892) ; G. P. Merrill in Ann. Rep. Smithsonian. Inst. (Rep. U.S. Nat. Mus.) 1895, t. 9, p. 993 (1897) ; Dalla Torre & Harms, Gen. Siphonog. 287 (1901).—Species one from Cedros Island, Lower California.

Standard species : *V. cedrosensis* A. Gray, the type.

Veatchia Kellogg. Liliaceae.

This genus is usually regarded as reduced to *Brodiaea* Sm. (1811), which name is conserved (see International Rules, ed. 3, 92 : 1935) against *Hookera* (1808).

Although *Veatchia* Kellogg is not kept up and is very unlikely to be considered an independent genus in future, it seems unwise to conserve *Veatchia* A. Gray, even though a new name must be found for it. It is a monotypic genus, not very well known, and the sound of the name may very easily be confused with *Veitchia* Wendl. (Palmae) which genus is far better known, and, although a later homonym itself, is put forward in this paper for conservation (see below).

639 *Veitchia* H. Wendl. in Seemann, Fl. Vitiensis, 270, t. 81 (1868)

versus

Veitchia Lindl. in Gard. Chron. 1861, 265.

Veitchia H. Wendl. Palmae.

Adopted by: Fl. des Serres, Sér. II. ix. 17 (1873); Gartenfl. xxii. 118 (1873); Benth. & Hook. f. Gen. Pl. iii. 887 (1883); E. André in Rev. Hort. 1883, 344; Drude in Engl. & Prantl, Pflanzenfam. ii. III. 74 (1889); Dalla Torre & Harms, Gen. Siphonog. 42 (1900); Becc. in Webbia, v. 76 (1921), where he makes three new species.—About seven species from Fiji Islands and New Hebrides.

Standard species: *V. Storckii* H. Wendl., one of the four original species.

Veitchia Lindl. Pinaceae.

This genus contained one species, but now it is regarded as a synonym of *Picea* Link (see Dalla Torre & Harms, Gen. Siphonog. p. 3). The Index Kewensis, ii. p. 1172, reduces the species to *Picea Alcockiana*.

This genus appears very unlikely to be reinstated.

If the generic name *Veitchia* H. Wendl. is not conserved, a new name must be given to the genus and new specific transferences must be made.

As the genus is well-known and the name occurs in all floras concerned, *Veitchia* H. Wendl. is here recommended for conservation.

223A *Verinea* Merino in Anal. Soc. Espan. Hist. Nat. xxviii. 8 (1899)

versus

Verinea Pomel, Mat. Fl. Atlant. 1 (1860).

Verinea Merino. Gramineae.

Adopted by: Dalla Torre & Harms, Gen. Siphonog. 590 (1906).

This genus is very little known. Hackel in Engl. & Prantl, Nat. Pflanzenfam. Nachtr. III. 349 (1908), places it in "Addenda" and states that its position is uncertain. There are no specimens of this genus in the Kew Herbarium.

Standard species: *V. pterostachys* Merino, the type, from Spain. The genus is monotypic.

Verinea Pomel. Liliaceae.

This genus is universally reduced to *Asphodelus* L. (1753).

Although the earlier homonym is not kept up, it is inadvisable to conserve the name *Verinea* Merino at least until the genus can be properly established.

Verinea Merino is, therefore, not recommended for conservation.

9285 *Villanova* Lag. Gen. & Sp. Pl. 31 (1816)

versus

Villanova Ortega, Nov. Pl. Descr. Decad. 47, t. 6 (1797).

530

Villanova Lag. Compositae.

Adopted by: Less. Syn. Comp. 256 (1832); DC. Prodr. vi. 75 (1837); Benth. & Hook. f. Gen. Pl. ii. 404 (1873); Hoffm. in Engl. & Prantl, Pflanzenfam. iv. V. 259 (1890); Phil. in An. Mus. Nac. Chile, Bot., 1891, 47; Dalla Torre & Harms, Gen. Siphonog. 554 (1905); Reiche, Fl. Chile, iv. 113 (1905); Rydberg in Bull. Torr. Bot. Cl. 1910, xxxvii. 333; Wootton & Standley in Contrib. U.S. Nat. Herb. xix. 725 (1915).—Species about eight from America.

Standard species: *W. alternifolia* Lag., one of the three original species.

Villanova Ortega. Compositae.

This genus appears to have been kept up by no one. In the Index Kewensis, ii. 1202, it is reduced to *Parthenium* L. and the only species is *P. Hysterophorus*.

There is still another genus bearing this name, namely, *Villanova* Pourr. ex Cutanda, Fl. Comp. Madrid, 595 (1861). This is regarded by most botanists as *Securinega* Comm. 1789 (Euphorbiaceae), a name included in the list of nomina conservanda; see International Rules, ed. 3, 102 (1935). *Villanova* appeared as a synonym of *Colmeiroa buxifolia* and its publication was therefore invalid.

As it is unlikely that either *Villanova* Pourr. or *Villanova* Ortega will be revived as an independent genus, the way is clear for the conservation of *Villanova* Lag. if necessary.

Villanova Lag. is a well-known genus. If the name is not conserved it will become *Unxia* H.B.K. Nov. Gen. & Spec. iv. 279 (1820) under which name some transferences have been made. *Villanova* Lag., however, is adopted in most floras dealing with this area, and as the earlier homonym and later homonym are never likely to be revived, the name *Villanova* Lag. is here recommended for conservation.

8296 *Villaria* Rolfe in Journ. Linn. Soc. xxi. 311 (1884)

versus

Vilaria Guett. Mém. Minéral Dauphiné, i. Préf. p. clxx. et ii. t. 19 (1779).

Villaria Guett. ex DC. Prodr. vi. 542 (1837), pro syn.

Villaria Batty, Notice Hist. sur Villar (1858), cf. Bull. Soc. Bot. France, v. 309 (1858).

Villaria Rolfe. Rubiaceae.

Adopted by: Vidal, Phan. Cuming. Philipp. 180 (1885); K. Schum. in Engl. & Prantl, Pflanzenfam. iv. IV. 79 (1891); Dalla Torre & Harms, Gen. Siphonog. 498 (1905); Merrill in Philipp. Journ. Sc. v. 248 (1910); Merrill, Sp. Blanc. 363 (1918); Merrill, Enum. Fl. Pl. iii. 532 (1923).—About four species from the Philippines.

531

Standard species: *V. philippinensis* Rolfe, the type.

Villaria Guett. ex DC. Compositae.

De Candolle did not make a new name *Villaria* intentionally. He spelt the name with the double "l" and gave as the author Guett. and placed it in synonymy under *Arctium*, hence it was not validly published. *Vilaria* Guett. is now reduced to *Berardia* Vill., Compositae (1779)—see Index Kewensis, ii. 1203; Dalla Torre & Harms, Gen. Siphonog. 573; and Post & Kuntze, Lexic. 587. Post & Kuntze also mention *Villaria* Schreb. 1791 as a genus not sufficiently known to be classified. Most works omit any reference to this generic name.

Villaria Batty. Gentianaceae.

This is merely a spelling variant of the different generic name *Villarsia* Vent. (1803) Gentianaceae, which name is on the list of nomina conservanda, see Internat. Rules, ed. 3, 105 (1935).

Since therefore, the earlier homonyms of *Villaria* Rolfe, Rubiaceae, are never kept up, it seems advisable to conserve the later name. *Villaria* Rolfe is a well known genus from the Philippines and the name is found in all floras dealing with this area. There is no later name available, so if *Villaria* Rolfe is not conserved, a new name will have to be given to the genus and several new transferences made. In order to avoid any nomenclatural change *Villaria* Rolfe is here recommended for conservation.

8155 *Virecta* Afzel. ex Sm. in Rees, Cycl. xxxvii. (1819), p.p.; DC. Prodr. iv. 414 (1830)

versus

Virecta L.f. Suppl. 17 (1781).

Virecta Afzel. Rubiaceae.

Adopted by: G. Don, Gen. Syst. iii. 521 (1834); Endl. Gen. 551, n. 3247 (1838); Meissn. Gen. 159 (1838); Spach, Vég. Phan. viii. 373 (1839); Hiern in Oliv. Fl. Trop. Afr. iii. 47 (1871-7); Benth. & Hook. f. Gen. Pl. ii. 55 (1873); K. Schum. in Engl. & Prantl, Pflanzenfam. iv. IV. 29 (1891); C. H. Wright in Kew Bull. 1898, 302; Dalla Torre & Harms, Gen. Siphonog. 491 (1905); Thonner, Blütenpfl. Afr. 563 (1908); T. & H. Durand, Syll. Fl. Congol. 247 (1909); S. Moore in Journ. Bot. xlviii. 220 (1910); Mildbraed in Wiss. Ergebn. Deutsch. Zentr.-Afr. Exped. 1907-8, ii. 313, 658, 683 (1911-14), et l.c. 1910-11, ii. 91 (1922); Hutchinson & Dalziel, Fl. W. Trop. Afr. ii. 130 (1931).—About 10 species from Tropical Africa.

Standard species: *V. multiflora* Sm. Smith originally had four species in his genus of which two are transferred to *Sipanea* Aubl. Of the two remaining species perhaps *V. multiflora* Sm. is the better known.

Virecta Linn. f. Rubiaceae.

Adopted by: Willd. Sp. Pl. i. 972 (1798); Schreb. Gen. i. 125 (1789); Juss. Gen. 200 (1789); Pers. Syn. i. 205 (1805); Gaertn. Fruct. iii. 31 (1805); Roem. & Schult. Syst. v. 4 (1819).

Although this genus was adopted by several of the older botanists, it is almost universally reduced to *Sipanea* Aubl. (1775), see Index Kewensis, ii. 1210; Dalla Torre & Harms, Gen. Siphonog. 493; Post & Kuntze, Lexic. 588.

If the generic name *Virecta* Afzel. is not conserved, the genus would probably become *Phyteumoides* Smeathm. ex DC. Prodr. iv. 414 (1830), although De Candolle records it here only in synonymy under *Virecta* Sm. No transferences except *P. hirsutus* Smeathm. ex DC. are recorded.

The genus *Virecta* Afzel. ex Sm. is very well known, and as the earlier homonym is never likely to be revived, the name *Virecta* Afzel. ex Sm. is here recommended for conservation.

3608 *Virgilia* Lam. Illustr. ii. 454, t. 326 (1793)

versus

Virgilia L'Hérit. Diss. (1788); et ex DC. Prodr. v. 652 (1836).

Virgilia Lam. Leguminosae.

Adopted by: R. Br. in Ait. Hort. Kew. ed. 2, iii. 4 (1811); Sims in Bot. Mag. xxxviii. t. 1590 (1813); Link, Enum. i. 401 (1821); Spreng. Gen. i. 364 (1830); G. Don, Gen. Syst. ii. 111 (1832); Meissn. Gen. 80 (1837); Endl. Gen. 1308, n. 6741 (1839); Harv. in Harv. & Sond. Fl. Cap. ii. 266 (1861-2); Benth. & Hook. f. Gen. Pl. i. 554 (1865); Taubert in Engl. & Prantl, Pflanzenfam. iii. III. 198 (1892); Dalla Torre & Harms, Gen. Siphonog. 222 (1900); Sim, For. Fl. Cape Colony, p. 204, t. 56 (1907); L. H. Bailey, Stand. Cycl. Hort. vi. 3480 (1917); Phillips, Gen. S. Afr. Fl. Pl. 317 (1926); Adamson in Journ. Bot. 1934, lxxii. 43, where he describes a new species *V. divaricata*.—Species two from South Africa.

Standard species: *V. capensis* Lam. Lamarck included two species in his genus, *V. aurea* which has been referred to *Calpurnia lasiogyne*, and *V. capensis* which is still retained within the genus.

Virgilia L'Hérit. Compositae.

This genus is universally reduced to *Gaillardia* Foug. (1788). See Pfeiffer, Nom. Bot. ii. II. p. 1589; Index Kewensis, ii. p. 1210; Dalla Torre & Harms, Gen. Siphonog. p. 556; and Post & Kuntze, Lexic. p. 588, who give the year 1789 as the date of *Virgilia* L'Hérit. If the generic name *Virgilia* Lam. is not conserved it will become *Andrastis* Raf. ex Benth. in Ann. Wien Mus. ii. 86 (1838)—a name scarcely known.

The name *Virgilia* is very well known and occurs in all floras of S. Africa as can be seen from the above citations. It is a genus known also to horticulturists. Since, therefore, the earlier homonym has become a definite synonym, the name *Virgilia* Lam. is here strongly recommended for conservation.

124 **Vossia** Wall. & Griff. in Journ. Asiat. Soc. Bengal, v. 572 (1836)

versus

Vossia Adans. Fam. ii. 243 (1763).

Vossia Thümen in Oesterr. Bot. Zeitschr. 1879, 18.

Vossia Wall. & Griff. Gramineae.

Adopted by: Griffith in Ann. Sc. Nat. Sér. II. ix. 373 (1838); Endl. Gen. i. 1354 (1841); Griff. Ic. Pl. Asiat. t. 153 (1851); Griff. Notul. iii. 70, Index, 12 (1851); Steud. Syn. Pl. Glum. i. 359 (1854); Grant in Trans. Linn. Soc. xxix. 175, t. 116 (1875); Benth. in Benth. & Hook. f. Gen. Pl. iii. 1131 (1883); Hack. in Engl. & Prantl, Pflanzenfam. ii. II. 25 (1887); Hack. in DC. Monogr. Phan. vi. 269 (1889); Baill. Hist. Pl. xii. 324 (1894); Hack. The True Grasses, 54 (1896); Hook. f. Fl. Brit. Ind. vii. 151 (1896); Hope in Ann. Bot. xvi. 501 (1902); Prain, Bengal Pl. ii. 1193 (1903); Stapf in Prain, Fl. Trop. Afr. ix. 41 (1917); Massey, Sudan Grasses, 11 (1926); Bews, The World's Grasses, 254 (1929); Robyns, Fl. Agrost. i. 49 (1929).—Species one from Tropical Africa and India.

Standard species: *Vossia cuspidata* (Roxb.) Griff., the type.

Vossia Adans. Ficoidaceae.

This genus appears to have been adopted by no botanists—it is universally sunk under *Mesembryanthemum* L. (1753).

Vossia Thümen 1879 is a fungus genus. It was recognized by Koernicke that the name could not stand owing to the existence of *Vossia* Wall. & Griff., Gramineae, and he therefore changed it to *Neovossia* Koern. in Oesterr. Bot. Zeitschr. 1879, 217, which name is accepted by mycologists.

As *Vossia* Wall. & Griff. is such a well-known genus and the earlier homonym not only a synonym of *Mesembryanthemum*, but the name itself scarcely known amongst botanists, the writer has no hesitation in recommending *Vossia* Wall. & Griff. (Gramineae) for conservation.

3647 **Walpersia** Harv. in Harv. & Sond. Fl. Cap. ii. 26 (1861)

versus

Walpersia Reissek ex Endl. Gen. 1100, n. 5736 (1839).

Walpersia Meissn. ex Krauss in Flora, xxvii. 357 (1844).

Walpersia Harv. Leguminosae.

Adopted by: Benth. & Hook. f. Gen. Pl. i. 473 (1865); Taubert

in Engl. & Prantl, Pflanzenfam. iii. III. 216 (1893); Dalla Torre & Harms, Gen. Siphonog. 224 (1900); Phillips, Gen. S. Afr. Fl. Pl. 319 (1926); Levyns, Guide Fl. Cap. Penins. 151 (1929).—Species one from South Africa.

Standard species: *W. burtonioides* Harv. & Sond., the type.

Walpersia Reissek. Rhamnaceae.

This genus is universally sunk in *Phylica* L. 1753, see Index Kewensis, ii. 1224; Dalla Torre & Harms, Gen. Siphonog. 302; Post & Kuntze, Lexic. 591. Pfeiffer, Nom. Bot. ii. II. 1605, reduced the genus to *Trichocephalus* Brongn., which genus also is reduced to *Phylica* L.

Walpersia Meissn. Leguminosae.

This name was placed by Krauss in Flora, xxvii. 357, in synonymy with *Sigmodostyles* Meissn. (1843) and both these genera are universally reduced to *Rhynchosia* Lour. (1790).

Neither *Walpersia* Reissek nor *Walpersia* Meissn. is ever likely to be reinstated as an independent genus.

Walpersia Harv. Leguminosae is well known in South Africa and unless this name is conserved the genus must be given a new name. In order to avoid any unnecessary change in nomenclature the name *Walpersia* Harv. is here recommended for conservation.

1739 **Warmingia** Reichb. f. Otia Bot. Hamburg. 87 (1881)

versus

Warmingia Engl. in Mart. Fl. Bras. xii. II. 86, 92 (1874).

Warmingia Reichb. f. Orchidaceae.

Adopted by: Benth. & Hook. f. Gen. Pl. iii. 477 (1883); Reichb. f. Xenia Orch. iii. 57, t. 226 (1883); Vidensk. Meddel. Kjöbenhavn, 1883, 356, t. 5, f. 6 (1884); Pfitzer in Engl. & Prantl, Pflanzenfam. ii. VI. 189 (1889); Dalla Torre & Harms, Gen. Siphonog. 108 (1900); Mart. Fl. Bras. iii. VI. 117, t. 27 (1904).—Species two from Brazil.

Standard species: *W. Eugenii* Reichb. f., the type.

Warmingia Engl. 1874.

Engl. l.c. p. 86, made the Rutaceous genus *Warmingia*, but on p. 92 he himself replaced it by *Ticoria* Aubl.

Later, on p. 281, Engl. made another *Warmingia*, which he placed in Burseraceae, but which has subsequently been sunk under *Spondias* L., Anacardiaceae.

Schlechter, Die Orchideen, 461 (1915) sinks the genus *Warmingia* Reichb. f. together with its two species, under *Macradenia* R. Br.

On the other hand, if *Warmingia* Reichb. can be established definitely as an independent genus there is no obstacle against the conservation of the name.

According to Mansfeld in Notizbl. Bot. Gard. Berlin, ix. 590 (1926), in adnot., the genera are distinct.

It seems, advisable, therefore to conserve the name *Warmingia* Reichb. f. for the Orchidaceous genus if accorded independent rank.

543 *Washingtonia* H. Wendl. in Bot. Zeit. xxxvii. p. lxi. 68, 148 (1879)

versus

Washingtonia Rafin. in Amer. Monthly Mag. ii. 176 (1818).

Washingtonia Winslow in Calif. Farm. (Sept. 1854), ex Hook. Kew Journ. vii. 29 (1855).

Washingtonia H. Wendl. Palmae.

Adopted by: Benth. & Hook. f. Gen. Pl. iii. 923 (1883); Parish (Calif. Palms) in Gard. & For. iii. 51-52 (1890); Dalla Torre & Harms, Gen. Siphonog. 37 (1900); Eastw. (Handb. Trees Calif.) in Occ. Papers Calif. Acad. Sc. ix. 32, t. 18 (1905); Parish in Bot. Gaz. xlv. 408-431 (1907); et l.c. xlviii. 462 (1909); L. H. Bailey, Stand. Cycl. Hort. v. 2443 (1916), vi. 3506 (1917); Jepson, Fl. Calif. Pt. vi. 243 (1922); Sargent, Man. Trees N. Amer. ed. 2, 104 (1922); Jepson, Fl. Econ. Pl. Calif. 173 (1924).—Species about three from California and Arizona.

Standard species: *W. filifera* H. Wendl., the type.

Washingtonia Rafi. Umbelliferae.

This genus although reduced by most botanists to *Osmorrhiza* Rafin. (1818)—see Dalla Torre & Harms, Gen. Siphonog. 367—has been kept up by certain American botanists, namely, Coulter & Rose in U.S. Dep. Agric., Contrib. Nat. Herb. vii. 60 (1900); Britton & Brown, Ill. Fl. N. States and Canada, ed. 2, ii. 627 (1913).

Washingtonia Winslow. Pinaceae.

This genus appears to be universally reduced to *Sequoia* Endl. (1847)—a nomen conservandum. There were three species, all of which are reduced to *Sequoia gigantea*, see Index Kewensis, ii. 1225; Dalla Torre & Harms, Gen. Siphonog. p. 3.

The genus *Washingtonia* H. Wendl., unless the name is conserved, becomes *Neowashingtonia* Sudw. in U.S. Dep. Agric., Forest Bull. No. 14, 105 (1897), No. 17, 38 (1898). Sudworth has also made specific transferences.

Such a case as *Washingtonia* H. Wendl. is a difficult one upon which to arrive at a decision. But all things considered, the fact that the genus is so well known, both botanically and horticulturally, and its inclusion as *Washingtonia* in the recent flora of California by Jepson, encourages the writer to recommend the name *Washingtonia* H. Wendl. for conservation.

9192 *Wedelia* Jacq. Enum. Pl. Carib. 8, 28 (1760)

versus

Wedelia Loebl. Iter Hisp. 180 (1756).

536

Wedelia Jacq. Compositae.

Adopted by: Jacq. Select. Stirp. Amer. Hist. 217 (1763); Willd. Sp. Pl. iii. III. 2334 (1804); H.B.K. Nov. Gen. iv. 214 (1820); Spreng. Gen. ii. 632 (1831); Less. Syn. 222 (1832); DC. Prodr. v. 538 (1836); Endl. Gen. 406, n. 2496 (1838); Benth. & Hook. f. Gen. Pl. ii. 370 (1873); Oliv. & Hiern in Oliv. Fl. Trop. Afr. iii. 376 (1877); Hook. f. Fl. Brit. Ind. iii. 306 (1881); Baker in Mart. Fl. Bras. vi. III. 179 (1884); Engl. & Prantl, Pflanzenfam. iv. V. 234 (1890); Dalla Torre & Harms, Gen. Siphonog. 548 (1905); Small, Fl. S.E.U.S. 407 (1913); Ewart & Davies, Fl. N. Terr. 280 (1917); Urb. (Fl. Domingensis) Symb. Antill. viii. 730 (1921); Gamble, Fl. Madras, Pt. iv. 706 (1921); Phillips, Gen. S. Afr. Fl. Pl. 656 (1926); Ewart, Fl. Victoria, 1160 (1930); Hutchinson & Dalziel, Fl. W. Trop. Afr. ii. 145 (1931).—From 60-80 species in tropical regions.

Standard species: *W. fruticosa* Jacq., the type.

Wedelia Loebl. Nyctaginaceae.

This genus is almost universally reduced to *Allionia* L. 1759. *Allionia* L., moreover, is a nomen conservandum against *Wedelia* Loebl. (see International Rules, ed. 3, p. 96: 1935).

The genus *Wedelia* Jacq. is a very large one comprising up to eighty species with a very wide distribution in the tropics of both the old and new world.

In view of the earlier homonym being a nomen rejiciendum, and in order to avoid so very many nomenclatural changes, the name *Wedelia* Jacq. is, without hesitation, put forward for conservation.

8181 *Wendlandia* Bartl. Ordin. 211 (1830); et ex DC. Prodr. iv. 411 (1830)

versus

Wendlandia Willd. Sp. Pl. ii. 275 (1799).

Synonymum prius rejiciendum:

Cattutella Reichb. Consp. 94 (1828).

Wendlandia Bartl. Rubiaceae.

Adopted by: G. Don, Gen. Syst. iii. 517 (1834); Wight & Arn. Prodr. i. 402 (1834); Meissn. Gen. 159 (1838); Endl. Gen. 552, n. 3252 (1838); Spach, Vég. Phan. viii. 373 (1839); Walp. Rep. vi. 58 (1846-47); Benth. & Hook. f. Gen. Pl. ii. 50 (1873); Hook. f. Fl. Brit. Ind. iii. 37 (1880); K. Schum. in Engl. & Prantl, Pflanzenfam. iv. IV. 37 (1891); Trimen, Handb. Fl. Ceylon, ii. 297 (1894); Koorders & Valetton, Bijdr. Booms. Java, viii. 53 (1902); Dalla Torre & Harms, Gen. Siphonog. 492 (1905); Talbot, For. Fl. Bombay, ii. 92 (1911); Koorders, Excursfl. Java, iii. 248 (1912); Fyson, Fl. Nilgiri & Pulney Hill Tops, iii. 61, 355 (1920); Gamble, Fl. Madras, Pt. IV. 586 (1921); Pitard & Lecomte, Fl. Gén. Indo-Chine, iii. 60 (1922); J. M. Cowan in Notes Roy. Bot. Gard. Edin. xvi. 233-314 (1932),

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where there is a revision of the genus.—About 59 species from India and Malay Archipelago to China.

Standard species: *W. paniculata* DC., one of the original species.

Wendlandia Willd. Menispermaceae.

Wendlandia Willd. is a nomen rejiciendum, *Cocculus* DC. (1818) being conserved against it, see International Rules, ed. 3, 96 (1935). It thus forms no obstacle to the conservation of the later homonym *Wendlandia* Bartl.

Cattutella Reichb. Consp. 94 (1828) appears as name only without any description and thus has no claim to recognition.

The genus *Wendlandia* Bartl. is a fairly large one and has a wide distribution. If the name is not conserved it will be necessary to give the genus a new name and thereby many nomenclatural changes will occur. *Sestinia* Boiss. & Hohenacker, Diagn. iii. 55 (1843) is a later synonym of *Wendlandia* Bartl., but the name is invalid as it was published in synonymy.

As there appears to be no obstacle whatever to the conservation of *Wendlandia* Bartl., Rubiaceae, the writer strongly recommends that this name should be included on the list of nomina conservanda.

3931 *Wendtia* Meyen, Reise, i. 307 (1834)

Wendia Hoffm. Gen. Umbellif. 136 (1814).

Wendtia Meyen. Geraniaceae.

Adopted by: Klotzsch in Linnaea, x. 432 (1835); Meissn. Gen. 58 (1837); Endl. Gen. 1169, n. 6051 (1840); Benth. & Hook. f. Gen. Pl. i. 275 (1862); Reiche in Engl. & Prantl, Pflanzenfam. iii. IV. 13 (1890); Reiche, Fl. Chile, i. 295 (1896); Dalla Torre & Harms, Gen. Siphonog. 247 (1901); Knuth in Engl. Pflanzenreich, Geraniac. 550 (1912); I. M. Johnston in Contrib. Gray Herb. n.s. lxxxii. 91 (1928).—About three species from Chile.

Standard species: *W. gracilis* Meyen, the type.

Wendia Hoffm. Umbelliferae.

De Candolle "corrected" this name to *Wendtia* DC. Prodr. iv. 194 (1830), and the name has been spelt thus by many subsequent botanists. The genus has been adopted by G. Don, Gen. Syst. and others, and as lately as 1917 by Woronow in Bull. Mus. Cauc. Tiflis, xi. 10 (1917).

The point to be decided in this case is whether *Wendtia* Meyen and *Wendia* Hoffm. are really homonyms. Hoffmann deliberately spelt the name *Wendia*; this, therefore, according to the Rules is the correct spelling.

The writer is of opinion that the two names are *not* homonyms and that both may be kept up, *Wendtia* Meyen (Geraniaceae) and *Wendia* Hoffm. (Umbelliferae).

3661 *Wiborgia* Thunb. Nov. Gen. & Spec. x. 137 (1800)

versus

Wiborgia Roth, Cat. Bot. ii. 112 (1800)

Wiborgia (*Viborgia*) Moench, Meth. 132 (1794).

Wiborgia Thunb. Leguminosae.

Adopted by: Willd. Sp. Pl. iii. 919, n. 1325 (1803); Pers. Syn. ii. 279 (1807); Spach, Vég. Phan. i. 153 (1834); Endl. Gen. 1263, n. 6479 (1840); Benth. in Lond. Journ. Bot. ii. 459 (1843); Harv. in Harv. & Sond. Fl. Cap. ii. 90 (1861–2); Benth. & Hook. f. Gen. Pl. i. 477 (1865); Taub. in Engl. & Prantl, Pflanzenfam. iii. III. 223 (1893); Dalla Torre & Harms, Gen. Siphonog. 225 (1900); Phillips, Gen. S. Afr. Fl. Pl. 321 (1926); Levyns, Guide Fl. Cape Penins. 153 (1929).—About ten species from South Africa.

Standard species: *W. obcordata* Thunb., one of the three original species.

Wiborgia Roth. Compositae.

Adopted by: Lessing in Linnaea, v. 148 (1830); Lessing, Syn. 245 (1832); Koch, Synops. 355 (1837), but by the very large majority of botanists treated as a synonym of *Galinsoga* Ruiz & Pav. 1794. See Pfeiffer, Nom. Bot. ii. II. 1613; Dalla Torre & Harms, Gen. Siphonog. 552; Index Kewensis, ii. 1229.

Viborgia Moench. Leguminosae.

This genus is almost universally sunk under *Cytisus* L. 1753 and it seems most unlikely that it will ever be revived as an independent genus. The genus *Wiborgia* Thunb. is a very well known South African genus, and since the two earlier homonyms are now included in other genera, the name *Wiborgia* Thunb. is put forward for conservation.

With regard to the spelling, the name is frequently seen with "V" as the initial letter, *Viborgia*. As Thunberg definitely adopted *Wiborgia* that spelling is retained here.

7035 *Wigandia* H.B.K. Nov. Gen. & Spec. iii. 126 (1818)

versus

Wigandia Neck. Elem. i. 95 (1790).

Wigandia H.B.K. Hydrophyllaceae.

Adopted by: Roem. & Sch., Syst. vi. p. xviii. 189 (1820); Reichb. Consp. 119 (1828); G. Don, Gen. Syst. iv. 251 (1837); Endl. Gen. 661, n. 3834 (1839); Benth. & Hook. f. Gen. Pl. ii. 831 (1876); Hemsl. Biol. Centr. Amer. ii. 359 (1882); Nicholson, Illustr. Dict. Gard. iv. 208 (1887); Peter in Engl. & Prantl, Pflanzenfam. iv. IIIA. 70 (1893); Dalla Torre & Harms, Gen. Siphonog. 424 (1904); Goyena, Fl. Nicarag. ii. 645 (1911); A. Brand in Engl. Pflanzenreich, Hydrophyllac. 134 (1913); L. H. Bailey, Stand. Cycl. Hort. vi. 3512 (1917); Urb. in Fedde,

Repert. xv. 415 (1919); Standley (Trees and Shrubs of Mexico) in Contrib. U.S. Nat. Herb. xxiii. 1213 (1924).—About six species from Tropical America.

Standard species: *W. caracasana* H.B.K., one of the three original species, and the one concerning which there has been little or no nomenclatural and taxonomic dispute. The other two original species are *W. urens* and *W. crispa*, and for synonymy and critical notes on these see A. Brand in Engl. Pflanzenreich, Hydrophyllac. 135 (1913) and Urb. in Fedde, Repert. xv. 415 (1919).

Wigandia Neck. Compositae.

This genus is universally included in *Disparago* Gaertn. (1791), which name is conserved against *Wigandia* Neck. (see International Rules, ed. 3, p. 110: 1935).

The genus *Wigandia* H.B.K. is very well known and adopted in all the floras concerned. It is also a genus of some horticultural importance. Probably the next available name for the genus is *Cohiba* Rafin. Fl. Tellur. iii. 75 (1836), but the writer has not been able to check this reference. No transferences from *Wigandia* have ever been made to this genus.

Since there is no obstacle in the way of conserving the name *Wigandia* H.B.K. it is here very strongly recommended for conservation.

293 *Willkommia* Hackel in Verh. Bot. Ver. Brand. xxx. Abh. 145 (1888)
versus

Willkommia Sch.-Bip. ex Nyman, Consp. 357 (1879).

Willkommia Hackel. Gramineae.

Adopted by: Hackel in Bull. Herb. Boiss. iv. 810 (1896); Dalla Torre & Harms, Gen. Siphonog. 21 (1900); Hitchc. in Bot. Gaz. xxxv. 283 (1903); Bews, World's Grasses, 185 (1929); Silveus, Texas Grasses, 389 (1933); Hitchcock, Man. Grasses U.S. 484 (1935).—About three species from S.W. Africa and one from Texas.

Standard species: *W. sarmentosa* Hackel, the type.

Willkommia Sch.-Bip. ex Nyman. Compositae.

This genus is universally reduced to *Senecio* L. 1753. It contained only one species, *W. minuta*=*Senecio minutus*. See Index Kewensis, ii. 1231.

The genus *Willkommia* Hackel is a small one, but as there is no later available name for it, and as *Willkommia* Sch.-Bip. is no longer considered an independent genus, *Willkommia* Hackel is here recommended for conservation.

6564 *Willughbeia* Roxb. Pl. Coromandel, iii. 77, t. 280 (1819)
versus

Willughbeia Scop. in Schreb. Gen. i. 162 (1789).

Willughbaeya Neck. Elem. i. 82 (1790).

Willughbeia Roxb. Apocynaceae.

Adopted by: Wall. Pl. As. Rar. iii. 45, t. 272 (1832); G. Don, Gen. Syst. iv. 101 (1837); Endl. Gen. 579, n. 3381 (1838); Meissn. Gen. 262 (1840); DC. Prodr. viii. 321 (1844); Benth. & Hook. f. Gen. Pl. ii. 691 (1876); Hook. f. Fl. Brit. Ind. iii. 623 (1882); K. Schum. in Engl. & Prantl, Pflanzenfam. iv. II. 130 (1895); Prain, Bengal Plants, 667 (1903); Dalla Torre & Harms, Gen. Siphonog. 405 (1904); Merrill in Philipp. Journ. Sc. Bot. 1913, viii. 387; Wernham in Trans. Linn. Soc. Bot. Ser. II. ix. 108 (1916); Merrill, Enum. Phil. Fl. Pl. iii. 320 (1923); Ridley, Fl. Mal. Penins. ii. 322 (1923).—8–10 species from Malaya, Assam and Ceylon.

Standard species: *W. edulis* Roxb., the type.

Willughbeia Scop. Apocynaceae.

This genus is considered by practically all botanists as synonymous with *Ambelania* Aubl. 1775. See Index Kewensis, ii. p. 1231; Dalla Torre & Harms, Gen. Siphonog. p. 404.

Willughbaeya Neck. Compositae.

This name is on the list of nomina rejicienda, *Mikania* Willd. (1803) being conserved against it (see International Rules, ed. 3, 109: 1935).

A genus "*Willughbeia* Klotzsch" in Peters, Reise Mossamb. Bot. 281 (1861) has been cited in standard works of reference, and reduced to *Landolphia* Beauv. (1806). Actually it has no existence, for Klotzsch merely published three new species which he erroneously referred to *Willughbeia* Roxb. He did not even give a revised description to the genus.

There are various orthographic variants of the name *Willughbeia*. The original spelling is adopted in this paper.

Willughbeia Roxb. is a well known genus and has a wide distribution. As the earlier homonyms offer no obstacles, the name is here recommended for conservation.

Xerocarpa H. J. Lam, Verbenac. Mal. Arch. 98 (1919)

versus

Xerocarpa Spach, Hist. Vég. Phan. ix. 583 (1840).

Xerocarpa H. J. Lam. Verbenaceae.

One species from New Guinea.

Standard species: *X. avicenniifoliola* H. J. Lam, the type.

Xerocarpa Spach. Goodeniaceae.

G. Don in his Gen. Syst. iii. 728 (1834) regarded *Xerocarpa*

as a section of *Scaevola* L., and in 1840 Spach raised it to generic rank, assigning it to Don. The genus, however, has not been adopted, and almost all botanists reduce it to *Scaevola* L. 1771. See Index Kewensis, ii. 1238, and Dalla Torre & Harms, Gen. Siphonog. 522.

Xerocarpa H. J. Lam is a monotypic genus and appears with a good description. If the name is not conserved, the genus must receive a new name. As there is no obstacle in the way and in order to avoid nomenclatural changes whenever possible, the name *Xerocarpa* H. J. Lam is recommended for conservation.

9186 *Zaluzania* Pers. Syn. ii. 473 (1807)
versus

Zaluzania Comm. ex Gaertn. f. Fruct. iii. 74 (1805), in syn.

Zaluzania Pers. Compositae.

Adopted by: Link, Enum. ii. 350 (1822) [*Zaluziana*]; Less. Syn. 224 (1832); DC. Prodr. v. 553 (1836); Endl. Gen. 408, n. 2511 (1838); Meissn. Gen. 131 (1839); Benth. & Hook. f. Gen. Pl. ii. 362 (1873); Hemsl. Biol. Centr. Am. ii. 159 (1881); A. Gray in Proc. Amer. Acad. xxi. 388 (1886); Hoffm. in Engl. & Prantl, Pflanzenfam. iv. V. 233 (1890); Robinson & Greenman in Proc. Amer. Acad. xxxiv. 530 (1899); Hieron. ex Sodiro in Engl. Jahrb. xxix. 35-37 (1900); Dalla Torre & Harms, Gen. Siphonog. 548 (1905); L. H. Bailey, Stand. Cycl. Hort. vi. 3532 (1917).—About 8-10 species from Central America.

Standard species: *Z. triloba* Pers., the type.

Zaluzania Comm. ex Gaertn. f. Rubiaceae.

The name was not validly published and is treated as a synonym of *Bertiera* Aubl. 1775. No species have ever been described under it. See Index Kewensis, ii. p. 1244, and Dalla Torre & Harms, Gen. Siphonog. 499.

As the earlier name *Zaluzania* Comm. was not validly published, *Zaluzania* Pers. stands without conservation.

4747 *Zollingeria* S. Kurz in Journ. As. Soc. Beng. xli. 303 (1872)
versus

Zollingeria Sch.-Bip. in Flora, xxxvii. 273 (1854).

Zollingeria S. Kurz. Sapindaceae.

Adopted by: Radlkofer in Engl. & Prantl, Pflanzenfam. iii. V. 319 (1895); Pierre, Fl. For. Cochinch. v. t. 325 (1895); Dalla Torre & Harms, Gen. Siphonog. 296 (1901); Lecomte, Fl. Gén. Indo-Chine, i. 1020 (1912); Radlkofer in Engl. Pflanzenreich, Sapindac. 724 (1932).—Two species from Burma and Cochinchina.

Standard species: *Z. macrocarpa* S. Kurz, the type.

Zollingeria Sch.-Bip. Compositae.

This genus appears to have been adopted by no other author. It is sunk under *Rhynchospermum* Reinw. (1828). See Index Kewensis, ii. 1253; Dalla Torre & Harms, Gen. Siphonog. 531; Post & Kuntze, Lexic. 601.

Zollingeria S. Kurz is only a small genus, but it is an important one, and this name has always been applied to the genus in all literature concerned with it. There is a later synonym, namely, *Belingia* Pierre, Fl. For. Cochinch. sub t. 325 (1895), but this was mentioned by Pierre, l.c. only as a synonym of *Zollingeria* S. Kurz. The name *Belingia* Pierre is very little known, and up to the present has even been omitted from the Index Kewensis.

In view of the fact that the earlier homonym *Zollingeria* Sch.-Bip. has been definitely reduced, it seems very desirable to conserve the well-known name *Zollingeria* S. Kurz, Sapindaceae, in order to avoid any unnecessary change in nomenclature.

3558 *Zuccagnia* Cav. Icon. v. 2, t. 403 (1799)

versus

Zuccagnia Thunb. Nov. Gen. Pl. ix. 127 (1798).

Zuccagnia Thunb. in Roemers Arch. ii. Pt. 1, 2 (1799).

Zuccagnia Cav. Leguminosae.

Adopted by: Pers. Syn. i. 461 (1805); Spreng. Gen. i. 353 (1830); G. Don, Gen. Syst. ii. 435 (1832); Meissn. Gen. 98 (1837); Benth. in Hook. Journ. Bot. ii. 72 (1840); Endl. Gen. 1314, n. 6773 (1841); Benth. & Hook. f. Gen. Pl. i. 587 (1865); Taubert in Engl. & Prantl, Pflanzenfam. iii. III. 173 (1892); Reiche, Fl. Chile, ii. 47 (1897); Dalla Torre & Harms, Gen. Siphonog. 219 (1900).—One species from Chile.

Standard species: *Z. punctata* Cav., the type.

Zuccagnia Thunb. [spelt *Zuccangnia* 1798] Liliaceae.

This genus with its one species has been almost universally reduced to *Dipcadi* Medik., and the species to *D. filamentosum* Medik. See Index Kewensis, ii. 1254; Dalla Torre & Harms, Gen. Siphonog. 68; Post & Kuntze, Lexic. 601. It seems very unlikely that it will ever be considered desirable to reinstate it.

If *Zuccagnia* Cav. is not conserved it will be necessary to give it a new name. In the circumstances, therefore, although it is a monotypic genus with a restricted distribution, it seems advisable to conserve the name *Zuccagnia* Cav., Leguminosae.

8312 *Zuccarinia* Blume, Bijdr. 1006 (1826)

versus

Zuccarinia Maerklin in Ann. Ges. Wetterau, ii. 252 (1811).

Zuccarinia Spreng. Syst. iv. Cur. Post. 50 (1827); Spreng. Gen. i. 169 (1830).

Zuccarinia Blume. Rubiaceae.

Adopted by: DC. Prodr. iv. 368 (1830); G. Don, Gen. Syst. iii. 487 (1834); Meissn. Gen. 161 (1838); Endl. Gen. 558, n. 3282 (1838); Spach, Vég. Phan. viii. 372 (1839); Benth. & Hook. f. Gen. Pl. ii. 97 (1873); K. Schum. in Engl. & Prantl, Pflanzenfam. iv. IV. 82 (1891); Koorders & Valeton, Bijdr. Boomsoort. Java, viii. 120 (1902); Koorders & Valeton in Ic. Bogor. ii. t. 147 & 148 (1904); Dalla Torre & Harms, Gen. Siphonog. 498 (1905); Koorders, Excursionsfl. Java, iii. 259 (1912); Koorders & Valeton, Atlas Baumarten Java, t. 564, 565 (1915); Ridley in Kew Bull. 1926, 68, where he describes a new species from Mentawi Islands.—Three species, two from Java and one from the Mentawi Islands.

Standard species: *Z. macrophylla* Bl., the type.

Zuccarinia Maercklin.

Pfeiffer, Nom. Bot. ii. II. p. 1659 states "novum gen. Verbenae et Buchnerae aff. (*Z. verbenacea*). It is recorded in Index Kewensis, ii. 1254 as "gen. dub." and the species *Z. verbenacea* Maerckl. l.c. 253 "(Quid?) Hab.?" and Dalla Torre & Harms, Gen. Siphonog. p. 586, include it among their "genera incertae sedis."

Zuccarinia Spreng. Rubiaceae.

This genus is not kept up, being regarded as synonymous with *Jackia* Wall. (1824) and the species *Z. ornata* Spreng. = *Jackia ornata*. See Index Kewensis, ii. II. 1254; Pfeiffer, Nom. Bot. ii. II. 1659; and Dalla Torre and Harms, Gen. Siphonog. 492.

Zuccarinia Blume (Rubiaceae) is very well known, and if the name is not conserved, the genus must receive a new one. The earlier homonyms offer no obstacle to the conservation of the later name.

In order to avoid nomenclatural changes as far as possible, the name *Zuccarinia* Blume is recommended for conservation.

THE GENDER OF GENERIC NAMES: A VINDICATION OF ART. 72 (2). T. A. SPRAGUE.

Dr. B. H. Danser of Groningen has recently contributed to Blumea, vol. I, No. 2, 1935, pp. 295-304, a paper entitled "Grammatical objections to the International Rules of Botanical Nomenclature, adopted at Cambridge in 1930." The first part of it consists of a criticism of the recommendations and rules concerning the formation of names adopted at Vienna in 1905, and does not call for immediate comment. The second part deals with Art. 72 (2) of the International Rules, adopted at Cambridge in 1930, and contains various statements which cannot be allowed to pass unchallenged. The following may be cited as examples: (1) "at the last Congress in 1930 new recommendations, and even a new rule, have been added, which not only recommend offences against Latin and Greek grammar, but make these even obligatory" (p. 296); (2) "This part of a rule (alas, not only a recommendation) is a mixture of grammatically correct and incorrect remarks and opinions" (p. 300); (3) "The remark that *Aceras* and *Xanthoceras* were wrongly taken as feminine . . . is against all grammar."

It is proposed to show that there is no foundation for these statements, in so far as they concern Art. 72 (2).

Before dealing with Dr. Danser's criticisms in detail, it seems desirable to emphasize a few fundamental considerations and corollaries which he has apparently overlooked or failed to appreciate.

1. Generic names are by their very nature nouns (i.e. substantives)* in the nominative singular, each with its own gender (Art. 25, 27).

2. Hence botanists who are forming generic names are recommended to avoid adjectives used as nouns (Rec. Xe).

3. A second reason for this avoidance is that Greek and Latin adjectives have three genders, and that it is not always possible to determine the gender from the ending. Thus many Greek adjectives end in *-os*, m.f., *-on*, n., and many Latin ones in *-is*, m.f., *-e*, n. The nominative form of the Latin adjectives *simplex*, *dispar*, etc., is the same in all three genders. The gender of a generic name which is a Greek or Latin adjective may therefore be ambiguous.

4. The scientific names of plants are largely drawn from medieval Latin, the international language of the Middle Ages. Hence "scientific names . . . taken from any language other than Latin, or formed in an arbitrary manner . . . are treated as if they were Latin"; and "Latin terminations should be used as far as possible for new names" (Art. 7).

5. It follows that existing names published with a medieval spelling, e.g. *Fagus sylvatica*, must not on that account be modified

* The word "noun" is used throughout this paper in the strict sense of "substantive" for brevity's sake.

or rejected (Art. 70), but that in the formation of *new* names such departures from classical spelling should be avoided (Rec. XLII). Botanical nomenclature contains many such names or epithets which offend the taste of classical scholars. These are retained, on grounds of practical convenience, but it is obviously undesirable to add to their number. The Rules, far from being "puritanical," are extremely tolerant. Dr. Danser apparently does not appreciate the basic difference between a "rule" and a "recommendation"; thus he writes that Rec. XL (a) and (b) "unnecessarily tie down botanists to stringent rules." The essential nature of a "recommendation" is that it is *not* binding. There is nothing to prevent him or any other botanist from publishing new specific epithets in the form *Hassleriana*, and once validly published they must not be altered to the recommended form *Hasslerana* (Art. 2, and Art. 70, examples of retention of original spelling). It was precisely because it was considered undesirable to tie botanists down to stringent rules in the formation of new epithets that these matters were dealt with by means of *recommendations*.

6. The primary object of the International Rules is purely practical: to save the time of botanists by establishing a uniform accepted nomenclature. The basis of this system was the general practice of botanists. The same principle is still in operation: "in the absence of a relevant rule, or where the consequences of rules are doubtful, established custom must be followed" (Art. 5).

7. There is fortunately no difference of opinion as to the correct genders of a great majority of generic names. There are many instances, however, where two (or even three) genders have been assigned by different botanists to the same generic name. Before the adoption of Art. 72 (2) at Cambridge in 1930, the linguistic and grammatical investigation of such cases occupied a great deal of valuable time that might more profitably have been devoted to taxonomic studies. Some guidance on this matter is evidently required by botanists, whether it be in the form of a rule or of a recommendation.

8. An ideal rule, governing the gender of generic names which are modern compounds of two or more Greek or Latin words, should satisfy five conditions: (1) its wording should be clear; (2) it should be easy to apply even by those possessing only a bare minimum of classical knowledge; (3) it should give the same gender to all generic names ending in the same element; (4) the gender assigned to each generic name should coincide with that of classical words ending in the same element, where such classical words exist; (5) the gender assigned should coincide with that already generally adopted for generic names ending in that element.

These five conditions may now be briefly considered in relation to Art. 72 (2), the text of which is as follows:—"Generic names which are modern compounds formed from two or more Greek or Latin words take the gender of the last. If the ending is altered, however, the gender will follow it."

(1) Judging by Dr. Danser's criticisms, he seems to have misunderstood Art. 72 (2) in one respect, and the text of the rule may therefore have to be somewhat expanded in order to make it more explicit. The Article neither states nor implies that the *original meaning* of generic names which are modern compounds is necessarily that of a noun. The first sentence of Art. 72 (2) states that such names take the gender of their last element [provided that the ending is not altered]. Thus any generic name ending in *-carpos* is, *irrespective of its original meaning*, automatically treated as masculine, like the Greek noun *carpos* itself. This *convention* has two great practical advantages: it makes it unnecessary to investigate the precise meaning of a generic name, which may in many cases be doubtful; and secondly that all generic names ending in the *same element* (unaltered) shall have the *same gender*. Thus the modern compound *ochrocarpos*, according to its derivation, might be either a noun, meaning "pale yellow fruit," or an adjective meaning "with pale yellow fruits": in the former case it would be masculine, in the latter case it might be either masculine or feminine. Under Art. 72 (2), however, the gender of the generic name *Ochrocarpos* Thou. (Guttiferae) is masculine, because *carpos* is masculine. Similarly the modern compound *aspidosperma* might be a neuter noun meaning "shield-seed," or a feminine adjective (with a latinized ending) meaning "with shield-like seeds." Under Art. 72 (2), however, the generic name *Aspidosperma* Mart. (Apocynaceae) is treated as neuter, because the Greek word *sperma* is neuter. The same principle applies to generic names which are modern compounds ending in the neuter Greek nouns *broma*, *derma*, *loma*, *nema*, *stelma*, *stemma*, *stigma*, *stoma*, etc.: *Theobroma*, *Scleroderma*, *Tricholoma*, *Spironema*, *Zygonema*, *Metastelma*, *Agrostemma*, *Ceratostigma*, *Melastoma* are all treated as neuter. The practical convenience of this convention is obvious. The case of *Melastoma* L. is illuminating. Linnaeus made the generic name feminine, but so strongly do botanists feel that all names ending in *-stoma* should be neuter, that *Melastoma* is nowadays by common consent treated as neuter.

The second sentence of Art. 72 (2) states that if the classical ending is altered by the author of a generic name, the gender will follow it. For this purpose the ending *-us*, is accepted as masculine, the endings *-a*, *-ia* and *-aea* as feminine, and those in *-on*, *-um*, *-ion* and *-ium* as neuter.

Hence *Adenocarpus*, *Artocarpus*, *Balanocarpus* and *Orthocarpus* are treated as masculine; *Callicarpa*, *Cyrtocarpa*, *Myriocarpa* and *Rhamphicarpa* as feminine; *Amphicarpacea*, *Leptocarpacea*, *Megacarpacea* and *Polycarpacea* as feminine; *Dermatocarpon*, *Endocarpon* and *Rhizocarpon* as neuter (like the Greek name *Polycarpon*); *Neurocarpum*, *Ormocarpum* and *Platycarpum* as neuter; *Pisocarpium* as neuter.

Similarly, the Greek noun *clados* being masculine, *Ancistrocladus*, *Dasycladus*, *Eriocladus* and *Trichocladus* are also masculine;

Calocladia, *Comocladia*, *Di cladia*, *Microcladia*, *Orthocladia* are feminine; *Didymocladon* is neuter. *Acladium*, *Actinocladium*, *Eucladium*, *Fusicladium* and *Lachnocladium*, derived from the Greek neuter noun *cladion* with latinization of the final syllable, are also neuter.

As further examples let us take the derivatives of *anthē*, f., and *anthos*, n., both meaning flower, and of *anthion*, n., meaning little flower. As stated in the examples of Art. 72 (2), it is agreed to assign the masculine gender to modern compounds of *anthos* in which the ending is unaltered, in view of the fact that almost all such compounds have in the past been treated as masculine. In accordance with the rule, *Calanthe*, *Eremanthe* and *Pneumonanthe*, being compounds of *anthē*, are feminine. Similarly *Adenanthos*, *Asteranthos* and *Pituranthos* are treated as masculine in accordance with the special convention concerning unaltered compounds of *anthos* and *cheilos*. It is unnecessary to investigate whether their original meaning was that of a noun or of an adjective. Under Art. 72 (2), it is immaterial whether compounds in *-anthos* and *-anthum* are derived from *anthē* or from *anthos*. In both cases they are treated as neuter because of their neuter ending *-on* or *-um*. *Halanthium* and *Melanthium*, derived from the Greek neuter noun *anthion* with latinization of the last syllable, are also neuter.

Greek words ending in *-anthes* may be masculine or feminine or neuter, since *-es* is a Greek adjectival ending (*-ης*, m.f., *-ες*, n.). Strictly speaking, generic names in *-anthes* should take the gender first assigned to them. As this appears to be feminine in almost all cases (*Strobilanthes* was published as masc.), it is now suggested that all such generic names be treated as feminine. Examples are *Achyranthes*, *Acleisanthes*, *Acrosanthes*, *Agathisanthes*, *Aphyllanthes*, *Axanthes*, *Byrsanthes*, *Calyptranthes*, *Chloanthes*, *Ilysanthes*, *Limnanthes*, *Menyanthes*, *Micranthes*, *Nyctanthes*, *Polianthes*, *Prenanthes*, *Spilanthes*, *Spiranthes*, *Trichosanthes*, *Trochisanthes*.

Modern compounds in *-anthis*, e.g. *Erantthis*, are also treated as feminine, both by analogy with Greek words in *-is* and in accordance with general custom.

(2) All the classical knowledge required for the application of the rule is that botanists should be able to look up the final element of a generic name in a Latin or Greek dictionary. They should accordingly know the characters of the Greek alphabet. If the classical ending is altered, the terminations *-os*, *-us* are treated as masculine, *-e*, *-a*, *-is* as feminine, *-on*, *-um*, *-ion*, and *-ium* as neuter. In case of doubt, established custom should be followed, but such cases form a very insignificant proportion of the whole.

Lists of words used as final elements in the formation of generic names are given by Saint-Lager, *Réforme de la Nomenclature Botanique*, pp. 89-108 (Ann. Soc. Bot. Lyon, vii.: 1880). A list of Greek root-words from which many botanical names are derived is given in Nicholson's *Dictionary of Gardening*, iv. 356-361. The derivations of many botanical names are given in Janssen's *Ordbog*

for Gartnere og Botanikere (Copenhagen, 1907), and in many botanical dictionaries. Wittstein's *Etymologisch-botanisches Handwörterbuch*, ed. 2 (1856) is useful to the more experienced worker, but the derivations supplied by him are in many cases incorrect, and on that account the book cannot be recommended to the beginner.

As a test of the application of Art. 72, let us take the 37 generic names mentioned on pp. 300-303 of Dr. Danser's paper. In Latin, the letters *ae*, *oe*, *u* and *y* replace the Greek *ai*, *oi*, *ou* and *u* respectively; *e* in Latin may represent either a short or a long *e* (*ε* or *η*) in Greek; and *o* in Latin may represent either a short or a long *o* (*ο* or *ω*) in Greek. If these changes are remembered, no difficulty should be experienced in finding in the Greek dictionary the nouns *rhododendron*, *calamagrōstis*, *hyoscyamos*, *melilōtus*, *oenanthē*, *petroselinon*, *alōpēcuros*, *tragopōgōn*, *euōnymos*, *polycarpon*; and eight out of these ten words occur also in Latin. According to the present text of Art. 72 (1), such classical words adopted as generic names take the gender assigned to them by their authors.*

Considering now the 27 modern compounds mentioned by Dr. Danser (l.c.), there should be no difficulty in tracing the final Greek elements of *Sarothamnus* (*thamnos*), *Ammochloa* (*chloa* or *chloē*), *Cephalotaxis* (*taxis*), *Chionodoxa* (*doxa*), *Cystopteris* (*ptēris*), *Helosciadium* (*sciadeion*), *Liriodendron* (*dendron*), *Sciadopitys* (*pitys*), *Aegopodium* (*podion*), *Agrostemma* (*stemma*), *Ceratophyllum* (*phyllon*), *Lycopus* (*pous*), *Amorpha* (*morphē*), *Ampelopsis* (*opsis*), *Brachypodium* (*podion*), *Cephalanthera* (*anthēra*), *Ceratocephalus* (*cephalē*), *Chorispōra* (*spōra*), *Coeloglossum* (*glōssa*), *Dielytra* (*elytra*), *Dimorphotheca* (*thēcē*), *Diploaxis* (*taxis*), *Echinops* (*ōps*), *Aceras* and *Xanthoceras* (*ceras*), *Tricholoma* (*lōma*), *Zygonema* and *Spironema* (*nēma*), *Calli-carpa*, *Polycarpaea* and *Ormocarpum* (*carpos*), *Pisocarpium* (*carpion*). Dr. Danser writes of *Chamaecyparis* as being a kind of "cyparis" (l.c. 301): actually the generic name is an abbreviated form of *chamaecyparissos*! It is treated as feminine since it ends in *-is*. *Equisetum* (*equisetum*) is a Latin word, and the final elements of *Caprifolium* (*folium*) and *Biscutella* (*scutellum*) are obvious. In fact the only generic name which might conceivably puzzle the beginner is *Pseudotsuga*, a hybrid compound of the Greek *pseudo* and the generic name *Tsuga* which is of Japanese origin. The so-called "puritanical" objection to *nomina hybrida* seems to be justified on grounds of convenience as well as of good taste.

(3) Art. 72 (2) also satisfies the third condition: that all generic

* I personally should prefer to retain the classical genders, except where alteration of the ending indicates a corresponding alteration of the gender (vide M. L. Green in Kew Bull. 1935, 77, n. 32). If this view is accepted at Amsterdam, here again no difficulty will arise. The change of ending from *-os* to *-us* will in that case merely confirm the Greek masculine gender of *Hyoscyamus*, *Melilotus* and *Alopecurus*, and indicate that *Euonymus* also should be treated as masculine, though *euōnymos*, the spindle-tree, is feminine in Greek; and the change from *petroselinon* to *Petroselinum* will also merely confirm the neuter gender of that generic name.

names ending in the same element shall be of the same gender. Instead of having to remember *separately* the genders of more than 200† generic names ending in *-carpos* or *-carpus*, there is only one fact to remember, namely, that the Greek word *carpos* (καρπός) is masculine.

(4) According to Art. 72 (2) modern generic names ending in *-odon*, *-panax* and *-pogon* are masculine, and so are the corresponding Greek words *cynodōn*, *opopanax*, and *tragopōgōn*; those in *-daphne*, *-opsis*, *-pteris*, *-rhiza* and *-taxis* are feminine, and so are the Greek words *chamaedaphne*, *prosopsis*, *thelypteris*, *glycyrrhiza* and *epitaxis*; those in *-blepharon*, *-phyllon* or *-phyllum*, *-podium* are neuter, and so are the Greek words *calliblepharon*, *triphyllon*, *melampodium*. Enough examples have been given to indicate that where a noun with its ending unaltered formed the final element of a Greek compound noun, that compound usually retained the same gender. The question of *adjectival* compounds with the same ending has been dealt with above under condition (1). The cases of modern compounds in *-ceras*, *-opsis*, *-taxis*, *-odon*, *-podion* (or *-podium*) and *-ops* are discussed in greater detail below.

(5) In order to test how far the gender prescribed by Art. 72 (2) agrees with *established custom* we may take from the index to Dalla Torre et Harms, *Genera Siphonogamarum*, the first 100 generic names which are modern compounds (with unaltered ending) of the following Greek words: *anthos* (*anthus*), *chilos* (*chilus*), *odon*, *panax*, *pogon*; *achne*, *carpha*, *cephala*, *daphne*, *opsis*, *thrix*; *ceras*, *nema*, *sperma*, *stelma*, *stemma*, *stigma*, *stoma*. These 100 generic names are as follows:—*Acanthonema*, *Acanthopanax*, *Acanthosperma*, *Acanthostemma*, *Achilus*, *Achnodon*, *Aciachne*, *Acianthus*, *Acicarpa*, *Acronema*, *Acropogon*, *Acrostemon*, *Acrostigma*, *Actinanthus*, *Actinodaphne*, *Actinostemma*, *Actinostemon*, *Actinostigma*, *Adelanthus*, *Adelostemma*, *Adelostigma*, *Adenanthos*, *Adenochilus*, *Adenonema*, *Adenostemma*, *Adenostoma*, *Adopogon*, *Aegiceras*, *Aegopogon*, *Aeolanthus*, *Aeschynanthus*, *Aëtanthus*, *Aëthionema*, *Aethonopogon*, *Afrodaphne*, *Agelanthus*, *Aglaonema*, *Agrostemma*, *Airopsis*, *Airosperma*, *Aitopsis*, *Allaeanthus*, *Allosperma*, *Alseodaphne*, *Amblostoma*, *Amblyanthopsis*, *Amblyanthus*, *Amblysperma*, *Amblystigma*, *Ammosperma*, *Ampelodaphne*, *Ampelopsis*, *Amphianthus*, *Amphipogon*, *Amphistelma*, *Anagosperra*, *Ancistrochilus*, *Ancylanthos*, *Ancyrostemma*, *Androchilus*, *Andropogon*, *Androstemma*, *Anemanthus*, *Anemopsis*, *Anemonopsis*, *Anetanthus*, *Angelopogon*, *Angianthus*, *Angkatanthus*, *Angraecopsis*, *Anisanthus*, *Anisochilus*, *Anisopogon*, *Anisostemon*, *Anoectochilus*, *Anomalostemon*, *Anomianthus*, *Anomopanax*, *Anthanema*, *Anthericopsis*, *Antheroceras*, *Anthodon*, *Anthopogon*, *Antidaphne*, *Aparinanthus*, *Apatanthus*, *Aphanostemma*, *Aplostemon*, *Apodocephala*, *Apogon*, *Arabidopsis*, *Arachnopogon*, *Arachnothrix*,

† There are at least 21 such beginning with the letter A in the Phanerogamae, and the total number in the Phanerogamae alone may accordingly be estimated at 200, since botanical names beginning with A form about one tenth of the whole.

Araliopsis, *Argostemma*, *Argyropsis*, *Ariopsis*, *Arnopogon*, *Artanema*.

Taking the genders assigned to them in the Index Kewensis as being, on the whole, those usually accepted by botanists, we find that 74 of the 100 generic names have the gender prescribed in Art. 72 (2), another 13 include some species of the gender prescribed and some of other genders, and only 13 generic names are recorded in the Index as being of different genders from those prescribed. *It is evident that the rule follows established custom*, in so far as that exists for the genders of generic names. If all modern compounds of Greek words were taken, the percentage of agreement would be found to be even higher, as the eighteen final elements selected for the test include three masculine nouns ending in *-on*, and six neuter ones in *-a*, which are apt to deceive those ill-acquainted with the Greek language.

Dr. Danser argues that names in *-opsis* and *-daphne* need not necessarily be feminine, as he considers that they may be adjectival: if he is right, it is very strange that botanists not only attribute the feminine gender to the 12 names in *-opsis*, and the 5 in *-daphne* contained in the test list, but—so far as I am aware—treat *all* generic names with these endings as feminine. Similarly, of the 7 generic names in *-nema*, 6 are treated as neuter and only 1 as feminine; and of the 9 names in *-stemma*, 8 are treated as neuter, and only 1 as feminine. It is evident that most botanists treat such generic names as nouns.

THE ORIGINAL GRAMMATICAL NATURE OF MODERN GREEK COMPOUNDS USED AS GENERIC NAMES.

Although generic names, *as such*, are nouns, yet their *original grammatical nature* may of course have been adjectival. Three classes of generic names may be distinguished as regards their origin: (1) those which, judging both by their ending and by comparison with similar compounds in the Greek language, were nouns, e.g. names in *-ceras*, *-opsis* and *-taxis*; (2) those which may have been either nouns or adjectives; e.g. names in *-odon*, *-podion*, and *-ops*; (3) those which were adjectives, e.g. names in *-anthes*, *-ceros* and *-ides*.

A. Compounds ending in *-ceras* and *-ceros*.

Dr. Danser lays great stress on the case of *Aceras* (l.c. 302), actually going so far as to write of “a herba aceras, a flos aceras, a semen aceras.” He states that *aceras* is an adjective meaning “hornless.” What are the facts? There is no Greek word *aceras*. “Hornless” in Greek is *aceratos* (ἀκέρατος). Apart from *calli-ceras*, dealt with below, the only Greek words ending in *-ceras* which I have found are *aigoceras*, lit. “goat-horn” and *bouceras*, lit. “ox-horn,” both being names for fenugreek (*Trigonella Foenumgraecum*), and *diceras*, meaning a “double horn”; all three are *neuter nouns*. The corresponding *adjectives* are *aigocerōs*, *bouceraos* and *boucerōs*, *diceraios*, *diceratos*, and *dicerōs*. “Horned” in Greek is *ceraos* (κεράος), and the usual adjectival terminations corresponding to “horned” are *-ceratos* (κερατός) and *-ceros*

(-κερως), additional examples of Greek adjectives being *monocerōs*, *triceratos*, *tricerōs*, *oxyceratos*, *oxycerōs*, *orthoceratos*, *orthocerōs*, *polycerōs*, *chrysocerōs*, *megalocerōs*, *callicerōs*. The adjective *monocerōs*, one-horned, was used also as a masculine noun meaning a unicorn, or animal with one horn. The masculine noun *rhinocerōs* doubtless had a similar origin. All these facts, which may be verified in any good Greek dictionary, indicate that modern compounds in *-ceras* should, in accordance with the principles of Greek word-formation, be treated as *neuter nouns*. The word *calliceras*, employed as an adjective in a single passage in Bacchylides, is apparently a poetical variant of the usual form *callicerōs*. This solitary exception hardly justifies Dr. Danser's assertion that, according to Greek grammar, *Aceras* and other compounds of *-ceras* (unaltered) are adjectives and can be masculine, feminine and neuter.

On the other hand, the generic names *Anthoceros* (Hepaticae), *Diceros*, *Helicodiceros*, *Tragoceros* and *Triceros* are clearly adjectival in origin, being compounds of *-cerōs* (-κερως), -horned. As far as their Greek form is concerned, they might be either masculine or feminine. The corresponding neuter forms, where known, end in *-cerōn* (-κερων), e.g. *megalocerōn*. Actually the first four have been treated as masculine by botanists, and the gender of the fifth may be either masculine or feminine, the two specific epithets hitherto published under it being *cochinchinensis* and *xalapensis*.

If the termination *-cera* is used in a botanical generic name, that is regarded as feminine: thus *Ampelocera*, *Calycera*, *Dicera*, *Tetracera* are all treated by botanists as feminine.

Some generic names ending in *-ceras* are treated as neuter in the Index Kewensis, e.g. *Aegiceras*, *Coccoceras*, *Carpoceras* Link, *Octoceras* and *Styloceras*; on the other hand, *Aceras*, *Buceras*, *Carpoceras* Rich. and *Antheroceras* are treated as feminine in the Index. Art. 72 (2) supplies a simple method of arriving at the correct* gender in cases of this kind where different genders have been assigned by botanists to generic names terminating in the same noun.

B. Compounds ending in *-opsis*.

Dr. Danser maintains that the meaning of the generic name *Ampelopsis* is adjectival, and that it, and other compounds of *-opsis*, may therefore be masculine, feminine or neuter. What are the facts?

The generic name *Ampelopsis* is compounded from *ampelos*, a vine, and *opsis* (ὄψις), a feminine noun meaning "appearance." The only Greek compounds of *opsis* traced in a short search are *diopsis*, *catopsis*, *prosopsis* and *synopsis*—all *feminine nouns*.

Ampelopsis means, literally, "vine appearance" or "vine look." The corresponding adjectival form, if it had existed, would have been *ampelopsios*, these two words being analogous with the

two existing Greek words *catopsis* view, and *catopsios* visible. No Greek adjective in *-opsis* has been traced. These facts suggest that Dr. Danser's view of the grammatical nature of compounds of *-opsis* is erroneous.

Ampelopsis and all other botanical generic names ending in *-opsis* have been treated as feminine, so far as I know, examples being *Anemonopsis*, *Castanopsis*, *Chrysopsis*, *Codonopsis*, *Coreopsis*, *Corylopsis*, *Cyamopsis*, *Dichopsis*, *Drimiopsis*, *Echidnopsis*, *Gynandropsis*, *Lycopsis*, *Meconopsis*, *Phalaenopsis*, *Sycopsis*, *Thermopsis*, *Thujopsis*. A single specific epithet in *Cyamopsis* and one in *Lycopsis* were, however, published as masculine.

C. Compounds ending in *-taxis*.

All Greek words which I have found ending in *-taxis* are *feminine nouns*, like *taxis* (τάξις) itself, e.g. *diataxis*, *epitaxis*, *metataxis*, *parataxis*, *syntaxis*. None of these is used as an adjective: the corresponding adjectival forms (where they occur) end in *-tacticos* (-τακτικός) and *-tactos* (-τακτός), e.g. *tacticos*, *tactos*, *diatacticos*, *epitacticos*, *epitactos*. The adjectival form of *Diplotaxis* would therefore have been *diplotacticos* or *diplotactos*, meaning "arranged in a double row." These facts are diametrically opposed to Dr. Danser's view that *Diplotaxis* and other compounds of *taxis* are adjectives. Not only has *Diplotaxis* the form of a Greek feminine substantive, but its meaning "double row" is also substantival. Furthermore, *Diplotaxis* and all other botanical generic names ending in *-taxis* have been made feminine by their authors, so far as I am aware, examples being *Monotaxis*, *Ditaxis*, *Tritaxis*, *Triplo-taxis*, *Tetrataxis*, *Heterotaxis*. On the other hand *Orthotactus* is clearly adjectival in origin.

D. Compounds ending in *-odon*.

Dr. Danser suggests that compounds ending in *-odon* were probably mentioned by error as masculine in the examples of Art. 72 (2): he thinks that they "are probably adjectival, transcribed from Greek names in *-odon* derived from ὀδούς". This is not the case. For very good reasons given below there appear to be no Greek words, terminating in *-odon*, that are derived from ὀδούς. Greek adjectives ending in *-odos* (m.f.), *-odon* (n.), are derived, not from *odous* (ὀδούς) m., a tooth, but from *hodos* (ὁδός) f., a way, path, road, e.g. *anodos*, *-on*, impassable, *euodos*, *-on*, easy to pass or travel. Examples of corresponding nouns are *diodos*, f., a way through, and *triados*, f., a meeting of three roads.

On the other hand, Greek adjectives and nouns in which the final element is derived from *odous*, m., a tooth, end in *-odous* (m.f.—a neuter form does not seem to occur), e.g. the adjectives *monodous*, one-toothed, *oxyodous*, sharp-toothed, *triadous*, three-toothed, *megalodous*, with large teeth, *myriodous*, with a multitude of teeth, and the masculine nouns *triadous*, a trident or a triangular figure, and *cynodous* (κυνόδους), a canine tooth.

* "Correct," firstly because it is in accordance with International Rules, and secondly because it is in accordance with similarly formed Greek words.

Thirdly, Greek adjectives and nouns in which the final element is derived from *odōn* (ὀδών), m., a tooth, end in *-odon*, e.g. the adjective *anodon* (ἀνόδων), toothless, and the masculine noun *cynodon* (κυνόδων), a canine tooth, and the name of a grass.

It was for these cogent reasons that generic names ending in *-odon* are treated in Art. 72 (2) as derivatives of *odōn* (ὀδών). Furthermore, it is at least probable that the ancient generic name *Cynodon* (κυνόδων) served as a pattern for the numerous modern ones with the same final element.

Names in *-odous*, if latinized, will receive the terminations *-odus*, m., *-oda*, f., *-odum*, n., e.g. *Anodus*, *Brachyodus* (Musci). *Anisodus*.

E. Compounds ending in *-podion* or *-podium*.

The generic name *Brachypodium* is considered by Dr. Danser to be an adjective which may be masculine, feminine or neuter, according to the noun with which it is associated in our thoughts. Greek words containing the same final element (unlatinized), namely *-podion*, are derived from the neuter noun *podion* (πόδιον) meaning a little foot. Examples of Greek nouns are *tripodion*, n., a tripod, *leontopodion*, n., little lion's foot, and *melampodion*, n., little black foot. Adjectives derived from the same final element end in *-podios*, m., *-podios* or *-podia*, f., and *-podion*, n., examples being *empodios*, *-on*, at one's feet, impeding, *epipodios*, *-a*, *-on*, upon the feet, and *peripodios*, *-a*, *-on*, going round the feet. A noun *peripodion*, n., also occurs.

As regards its form, *Brachypodium* may therefore be either a noun or an adjective, but it is clearly *neuter* in either case. The same holds for all other generic names in *-podium*, and for any in *-podion*, if such exist.

F. Compounds ending in *-ops*.

Modern generic names of plants ending in *-ops* were presumably modelled on the masculine Greek nouns *aigilops* (αἰγίλωψ), denoting *Quercus Cerris* and also *Aegilops ovatus*, and *cynops* (κύνωψ), a name for *Plantago lanceolata*. They may therefore be regarded as nouns derived from *ōps* (ὤψ), m.f. or n., meaning eye or face, hence facies or appearance, and not from *ōps* (ὀψ), f., a variant of *opsis* (ὀψις), f., which has much the same range of meaning. At least three corresponding *adjectival* forms are known, ending respectively in *-ōpos* (e.g. *asterōpos*, star-faced, star-eyed, *melanōpos*, black-looking, and *xanthōpos*, golden-looking), and *-ōpes* (e.g. *cynōpēs*, dog-eyed).

The word *cyclōps*, however, is used both as a masculine noun, and as an adjective, meaning round-eyed, and both *monōps*, one-eyed, and *chrysōps*, gold-coloured, shining like gold, are adjectives. As far as their *form* is concerned, modern generic names ending in *-ōps* might be either nouns or adjectives.

Under Art. 72 (2), since *ōps* itself may be masculine, feminine

or neuter, the gender of modern generic names ending in *ōps* may also be masculine, feminine or neuter. Each generic name in *-ōps* will accordingly take the gender originally assigned to it. Thus *Balanops*, *Dryobalanops*, *Gyrinops* and *Mimusops* will be treated as feminine, and *Echinops* and *Euryops* as masculine, since these were the genders adopted by the authors of the respective names.

G. Compounds ending in *-odes* and *-oides*.

Such compounds are clearly adjectival, and it is not possible to tell the gender from their form since the masculine and feminine forms end in *-es* (-ης) and the neuter in *-ēs* (-ες). Hence, in modern compounds with these endings, the gender assigned by the author, or, if he has failed to indicate it, by the first subsequent author who has done so, must be retained. Thus *Omphalodes* Moench and *Nymphoides* Hill are both feminine, because the original species were *O. verna* and *N. flava* (an incidental binominal).

What justification exists for Dr. Danser's statement that Art. 72 (2) conflicts with Greek Grammar? As shown above in sections A, B, C, he appears to be mistaken in some of his facts: compounds of *ceras*, *opsis* and *taxis* are clearly nouns in the light of the evidence supplied, and their prescribed genders are in accordance with Greek grammar. A second class of modern compounds such as those ending in the unaltered elements *-odon*, *-pogon*, *-carpos*, *-clados*, *-loma*, *-sperma*, may, by their form, be either nouns or adjectives. Nouns in *-carpos* will be masculine, adjectives with this final element either masculine or feminine, nouns in *-pogon* will be masculine, adjectives masculine, feminine or neuter; nouns in *-loma* and *-sperma* will be neuter, adjectives (with latinized ending) feminine. Since generic names are by their very nature nouns (Consideration 1), how is it contrary to Greek grammar to assign to these modern compounds the gender proper to nouns with the same final elements?

Dr. Danser's contention that we ought to consider whether the noun form or the adjectival form has the *more appropriate* meaning would, if accepted, immediately introduce a *subjective* element, which would make the determination of the gender of a generic name a *mere matter of opinion* in many cases. It is only in rare instances that a precise grammatical explanation and translation of a new generic name is given by its author. On the other hand the acceptance of the convention that when a generic name, by its form, may be either a noun or an adjective, it is treated as a noun, enables us to settle the gender by means of facts. The Rules of Nomenclature are concerned with facts of publication, not with suppositions, however plausible these may be.

Where a generic name is clearly adjectival in form, the gender may or may not be indicated by the ending. Here again, a minor *convention* is helpful: that the Greek adjectival termination *-os* is treated as masculine, owing to the fact that it is so frequently

replaced by the Latin *-us*. The ending *-os* (*-us*) is thus accepted as masculine, *-e* (*-a*) as feminine and *-on* (*-um*) as neuter.

Taking modern compounds and variants of *cephale* (κεφαλή) as examples, *Acephale* is feminine because its last element coincides with the Greek feminine noun from which it is derived, *Polycephalos* and *Ceratocephalus* are masculine by termination, *Dasycephala* is feminine, and *Dracocephalum* is neuter. Could any rule be simpler?

Where the gender is not indicated by the form as in adjectival compounds ending in *-oides* or *-odes* (see Section G) the original gender assigned is accepted.

Compounds formed by fusing a qualifying adjective with a qualified noun.

Dr. Danser states (l.c. 297-8) that such compounds are not permissible in Greek. Has he never heard of *oxygala* (ὀξύγαλα), sour milk, or of *agrielaia* (ἀγριελαία), wild olive? Although such compounds are admittedly rare in classical Greek, other examples are known, and a large proportion of compound generic names of Greek origin are of this nature. If the authors of the generic names *Asterothrix*, *Calytrix* (*Calythrix*), *Cladothrix*, *Diplothrix*, *Leptothrix*, *Malacothrix*, *Oligothrix*, *Polythrix* and *Ulothrix* had regarded them as *adjectives* one would have expected to find some of these names masculine, others feminine, and yet others neuter, since Greek adjectives in *-thrix* are the same in all three genders. Actually, however, seven of these nine generic names appear to have been treated by their authors as feminine*, and the gender of the remaining two is not indicated by the epithets of the original species or of subsequently described species. The original species of *Oligothrix* is *O. gracilis* which might be either masculine or feminine, and the two others are *O. Newtonii* and *O. xyridopsis* in which the gender is not indicated, since the specific epithets are nouns. The only species of *Polythrix* is *P. Stenandrium*, the specific epithet *Stenandrium* being the name of a related genus. All the facts taken together suggest that the authors of these nine generic names regarded them as *feminine nouns*, not as *adjectives*. This treatment is in accordance with established custom. In the Chlamydobacteriaceae, for example, the five generic names *Streptothrix*, *Phragmidiothrix*, *Crenothrix*, *Cladothrix*, *Thiothrix* are treated as feminine (Engl. u. Prantl, Nat. Pflanzenfam. 1, Abt. 1a, 35-40 : 1896).

SUMMARY.

1. The statement that Art. 72 (2) is *contrary* to Greek grammar has been shown to be without foundation.

2. Generic names are *by their very nature* nouns.

3. Where a generic name is a compound of two or more Greek words, the last of which is a *noun*, the compound may according to Greek grammar be *either* a noun or an adjective. The *convention*

* It has not been possible in one instance to refer to the original place of publication, but the author subsequently treated the name as feminine.

of treating such modern compounds as nouns with the same gender as the Greek noun with which they end is accordingly adopted in Art. 72 (2).

4. Where the ending of the final noun has been altered, the endings *-os*, *-us* are accepted as masculine, *-a*, *-ia*, *-aea*, *-is* as feminine, *-on*, *-um*, *-ion* and *-ium* as neuter. Those in *-os* might, according to Greek grammar, be *either* masculine or feminine in many cases (though only masculine in others). The minor *convention* of treating such names as masculine is adopted in Art. 72 (2).

5. Since the great majority of generic compounds ending in *-anthos* and *-chilos* have been treated by botanists as masculine this gender is retained, although such compounds should strictly speaking be neuter under the Rule. A similar *exception* is made in the case of compounds ending in *-gaster* which are treated as masculine in accordance with established custom, although the Greek noun *gastēr* is feminine.

6. It has been shown that Art. 72 (2) satisfies the following four requirements of an ideal rule governing the gender of generic names which are modern compounds of classical words:—

(1) It is easy to apply, even by those possessing little classical knowledge.

(2) It gives the same gender to all generic names ending in the same element.

(3) The gender given coincides with that of classical words ending in the same element.

(4) The gender given coincides with that already generally adopted by botanists for generic names ending in that element.

7. The extremely concise text of Art. 72 (2) may have to be somewhat expanded in order to make it more explicit.

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BULLETIN OF MISCELLANEOUS
INFORMATION No. 10, 1935
ROYAL BOTANIC GARDENS, KEW

XXXVIII—MATERIAL OF *MARQUESIA ACUMINATA*
FROM NORTHERN RHODESIA. HELEN BANCROFT (Imperial
Forestry Institute, Oxford).

Errata

In K. B. no. 4, 1935, article no. xv, the magnifications given under figs. 1-16 should be *doubled*. Those given in the text are correct.

In K. B. no. 5, 1935, 274, the initials "E.M.-R." in front of "*Monadenium succulentum*" should have been affixed to the end of the previous paragraph.

In loc. cit. 278. "*Loranthus tetrapartitus*" should read "*Loranthus tetrapartitus*." On the same page, 4 lines from the bottom, "25 mm." should read "2.5 mm."

(5, pp. 350-1). From the specimens of each species examined by the writer, however, the difference of leaf-form mentioned by Fries, does not appear to be constant and reliable; and the length of the fruit-wings given by this author for *Marq. acuminata* also indicates a variable character, for undoubted specimens of this species collected by Captain K. R. Paterson at Maionchi Farm in Northern Rhodesia, and now in the Kew Herbarium, have fruit-wings from 2-2.5 cm. in length. The measurement given by Fries for the fruit-wings of *Marq. macroura* is from 2-3 cm.; this agrees with cases noted by the writer. On the whole, the fruit-wings of *Marq. acuminata* appear to be broad, rather than short, as compared with those of *Marq. macroura*.

Marquesia acuminata is similar to *Marq. macroura* in general habit, for it is a clear-boled tree, attaining a height of 60 feet or more; also, the bole is buttressed, the buttresses being continued to a considerable height, although they are less deep than in the related species. Mr. Trapnell informs the writer that the tree behaves as an evergreen; and that he has seen it apparently regenerating from seed under the shade of the parent trees and their

¹ An account of this species has been recently published in the American Journal of Botany, 22, 723 (1935).

associates (see fig. 6). The wood, probably of the saplings, produced by this regeneration, is favoured for the making of bows.

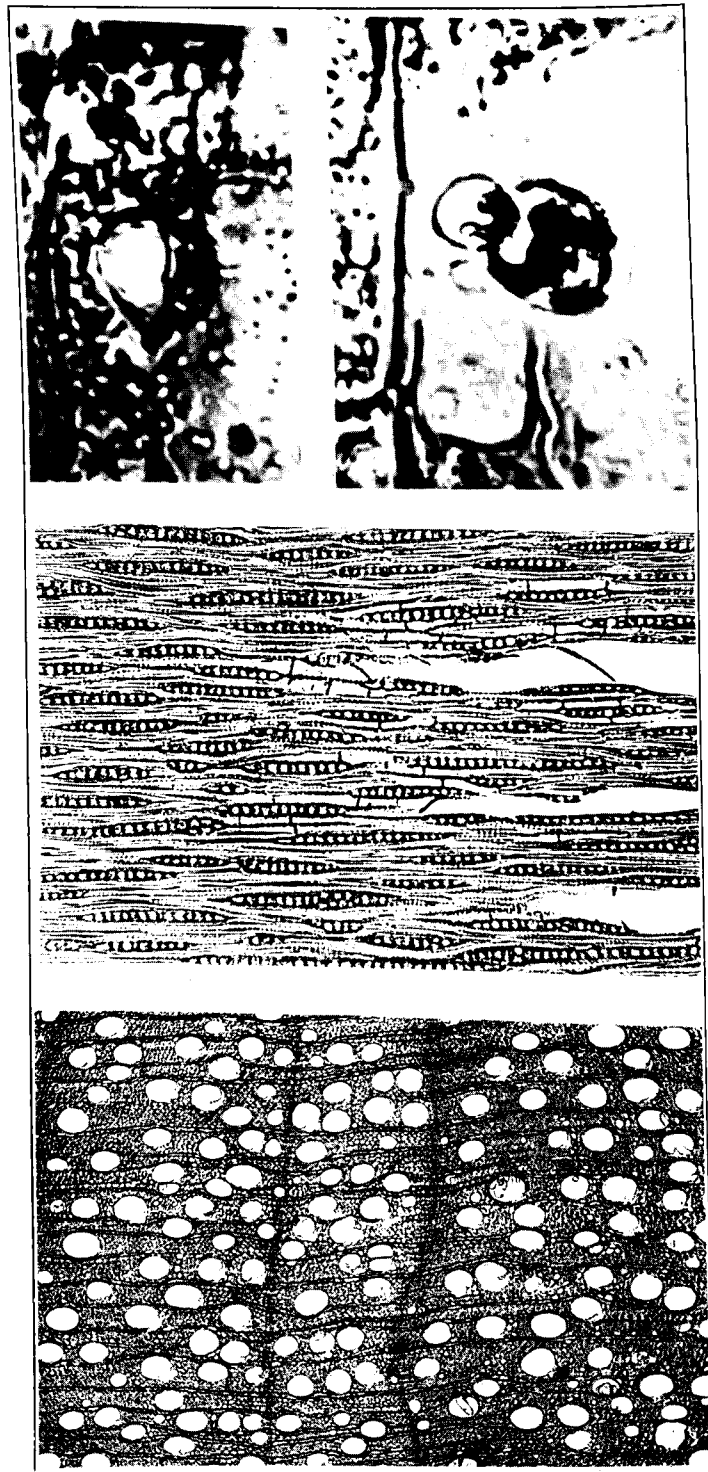
Marquesia acuminata was originally discovered by Buchner in Angola, and has subsequently been found in Northern Rhodesia. It apparently occurs in the Katanga (Belgian Congo) also; for the habit and the flower-structure² of *Monotes Gilletii* De Wild. from that area indicate that this species should be transferred to the genus *Marquesia*; while the large inflorescences and the character of the leaf-surfaces suggest at least a very close relationship with *Marq. acuminata*. Unfortunately, the imperfect leaf-tips of the Katanga specimen found by Gillet and described by De Wildeman (11, pp. 56-7), render it impossible finally to compare this particular example with *Marq. acuminata*; and there appear to be differences in the number of lateral veins, of which there are 12 or 13 pairs in the Katanga form, as against 9 or 10 pairs in the Angolan and Northern Rhodesian specimens (see fig. 5). From extended observations in the field, however, Mr. Milne-Redhead informs the writer that he has no doubt that *Monotes Gilletii* De Wild. and *Marquesia acuminata* (Gilg) R. E. Fr. are conspecific.

In Gilg's original description of "*Monotes acuminatus*," he notes "a gland" at the base of the lamina (6); in the Kew specimens collected by Captain Paterson, a pair of glands may be distinctly seen in many cases (fig. 5); while De Wildeman describes, for "*Monotes Gilletii*," glands at the base of the main vein, and in the axils of lateral veins; axillary glands, and also evidences of pairing at the base of the midrib, are certainly present in leaves of Gillet's specimen sent to the writer by Dr. Robyns. This is an interesting point; for while a single gland on the upper surface of the lamina at the base of the midrib appears to be characteristic of the *Monotoideae* as a whole, there are evidently forms in both *Monotes* and *Marquesia* in which gland-number is not invariable.³

No details with regard to habitat were recorded by Gilg in his original account of the Angolan material of *Marq. acuminata*. Mr. C. E. Duff has reported to the writer his observation, in Northern Rhodesia, of occasional examples of the species occurring under the same conditions as *Marq. macroura*, namely, on open plains at high altitudes, and in light acidic soil. It is also recorded of Gillet's Katanga specimen ("*Monotes Gilletii*") that it was growing on sandy soil on high open land in the Pese district, the size of the tree and the quality of the wood indicating that the acidic soil-type of this

² Specimens of flowers of "*Monotes Gilletii*" sent by Dr. W. Robyns of Brussels, have shown the structure to be similar to that in *Marq. macroura* where the 3-carpellary ovary is imperfectly divided. In species of *Monotes* the ovary is trilocular.

³ *Monotes glandulosissimus* Hutch. generally, though not invariably shows extra glands in the axils of the lateral veins (cf. Specimen 11220, in the Herbarium of the Imperial Forestry Institute); and in a very similar and probably nearly-related type, labelled "*Monotes* sp. near *Engleri*" (I.F. I. 34492), glands are developed in the vein-axils in the case of several leaves

Figs. 3 and 4. Radial sections. $\times 1100$.Fig. 2. Tangential section. $\times 85$.Fig. 1. Transverse section. $\times 40$.*Marquesia acuminata*

area was very favourable to its development (11, p. 56). According to Mr. Trapnell's observations in Northern Rhodesia; however, *Marq. acuminata* is essentially a woodland type of high altitudes; he reports that in the Mwinilunga district, where the rainfall is from 55 to 60 inches, it occurs at an altitude of approximately 4500 feet, associated with *Cryptosepalum pseudotaxus* and *Brachystegia spp.*, typically on a pinkish or reddish brown loamy sand, marginal to the Kalahari Sand.

The Rhodesian native name for *Marquesia acuminata* is muLunga (in chiLunda and chiNdembo), as reported by Mr. Trapnell, who also notes that a Kaonde native would probably use the same name as for *Marq. macroura*, that is, muSanya. Gilg, in his original description of the type (6), remarks that the Angolan natives termed it "Lungu," a name also applied to Gilg's species *Monotes caloneurus* (7, p. 136). It is interesting that Delevoy records for "*Monotes Gilletii*" the vernacular term "muSeshi," also used for *Marq. macroura* (4, p. 328); "hombo" is given by De Wildeman for the same type (11, p. 56).

MATERIAL AVAILABLE FOR EXAMINATION.

The wood of *Marquesia acuminata* available for examination consists of a block measuring 4" x 2" transversely x 6" longitudinally, taken from very near the centre of the original trunk. The block is numbered 6881 in the Imperial Forestry Institute collection, and was sent by Mr. Duncan Stevenson from Northern Rhodesia. In the Kew Herbarium there are authenticated specimens of leaves and flowers (*Milne-Redhead* 994) of the tree from which the block was cut, and also leaves and fruits⁴ (illustrated in fig. 5), collected by Captain K. R. Paterson in Northern Rhodesia; no wood specimen is available in the case of this latter herbarium material.

THE CHARACTERS OF THE WOOD.

General Properties.

Very hard, and heavy. *Weight* of air-dry wood:—54 lbs. per cubic foot. *Specific Gravity* of air-dry wood:—0.86. *Texture*: fine and close. *Grain*: somewhat indistinctly and unevenly "rib-boned." *Colour*: a light brown, somewhat darker, and with a reddish tinge, in the innermost rings of the wood; sap-wood, if present in the specimen, not differentiated, unless by lighter colour. *Lustre*: slight.

Macroscopic features.

Growth rings: distinctly visible on transverse surface, and slightly visible on radial surface. Narrow (except in the case of the innermost rings), somewhat variable in width and contour. Marked by darker colour and denser appearance of the ground-mass of the wood, with fewer vessels.

⁴ Fruits of the Katanga specimen are similar in type to these, but they have somewhat shorter, and considerably broader, fruit-wings (2 cm. x 0.8 cm., as against 2-2.5 cm. x 0.5 cm.).

Vessels: visible only with lens on transverse surface; typically solitary, very numerous, evenly distributed (except for point noted above), small, fairly uniform in size, though somewhat smaller in the denser zones of the wood. Vessel-lines visible to eye on longitudinal surfaces; individual elements visible with lens.

Ground-mass of wood: dense, individual elements not distinct, even with lens; soft tissue not visible.

Rays: extremely fine, very numerous and closely set. Visible only with lens on transverse and radial surfaces, on the latter showing as fine streaks of darker colour than the ground-mass of the wood; here and there the streaks are marked with fine glistening horizontal lines, representing horizontal walls of ray-cells; rays not visible with lens on tangential surface.

Ripple marks: absent.

Secretory canals: absent; numerous dark-coloured flecks and vertically-running streaks, however, occur in the innermost rings of this specimen, indicating the presence of resin in the tissues (see footnote 5).

Microscopic features (Plate X, Figs. 1, 2, 3 and 4).

GROWTH RINGS.—variable in contour and emphasis; not always clear microscopically, even when plain to the eye; marked typically by a decrease in *number*, or even complete absence, of vessels along a band of varying width; decrease in *size* of vessels at these points is variable and indefinite. Rings also marked by decrease in amount, or absence, of diffuse parenchyma; and occasionally by a very slight, very variable, compression of from 1 to 2 or 3 rows of fibres.

VESSELS—*Arrangement*: scattered and fairly evenly distributed except at boundaries of growth rings; bounded on one or both

⁵ i.e., in this specimen. Attention has already been drawn to the fact that in the innermost rings of the wood-block from which the sections were cut, there are numerous dark-coloured flecks and vertically-running streaks, indicating the presence of accumulated resin in the tissues. A microscopic examination of these flecks has shown them to present abnormalities of structure which suggest the probability that they were caused by insect attack, to which the *Monotoids* appear to be very liable. In association with these abnormalities, there are considerable accumulations of resin in the ray-cells, vertical parenchyma and tyloses, and also a very small amount in some of the vessels and fibres. While the contents of ray-cells, parenchyma and tyloses are resinous in the normal wood of this specimen, the vessels and fibres are prevailing without free resin or any other contents. The presence of resin in the elements, or its absence, is much more marked in unstained hand-sections cut directly from the block, than in sections of small portions of the wood which have undergone the prolonged boiling in water and preparation in hydrofluoric acid necessary for microtome sectioning.

Dr. C. R. Metcalfe reports that in a large wood specimen at Kew, apparently from the same tree as I.F.I. 6881, some of the vessels and fibres possess contents. It may, of course, be readily understood that if, for any reason, an excess of resin is produced, it may accumulate not only in the immediately active cells, but also in the neighbouring elements, either abnormal or normal. There is little doubt that the Kew specimen of *Marq. acuminata* was taken from a more resinous part of the tree, as Dr. Metcalfe suggests.

sides by rays; generally solitary, with an occasional tendency to alignment in short oblique series; vessel-pairs occasional; groups of more than 2 vessels extremely rare. *Numerical distribution*: very numerous; 42 ± 5 solitary vessels per sq. mm., with approximately 2 per cent. of pairs. *Size*: very small to small; tangential diameter of solitary vessels in transverse section, $53 \pm 12 \mu$; radial diameter, $89 \pm 26 \mu$; vessel elements short; length, $445 \pm 82 \mu$.⁶ *Form of vessel-elements*: elongated and straight-sided, elliptical in transverse section; with or without "tails" at one or both ends, though tails comparatively infrequent in this sample; tails very variable in length and breadth, and *mainly* associated with the narrower vessel-elements, where they are sometimes long and broad as compared with the "body" of the element. *Perforations*: simple; variable in inclination, being almost horizontal to markedly oblique. *Walls*: comparatively thin. *Pits*: mostly small and numerous, but not contiguous; somewhat unevenly distributed; apertures mostly very small, somewhat rounded to (generally) elliptical, or slit-like, at varying inclinations, or horizontal. Vessel-fibre pits distinguishable as being in regular, more or less vertical lines, and vessel-ray pits as being in short, horizontally-aligned groups. Pits generally clearly bordered, with whatever elements they communicate, except those communicating with marginal cells of rays (and occasionally, in the case of higher rays, with certain central body cells also); these are comparatively large, rounded to elliptical in shape, and appear to be only very narrowly (or scarcely) bordered. These larger "pits" very frequently suggest actual perforations (Plate X, fig. 3), the apertures appearing to have somewhat thickened rims; occasionally, the connection between them and tylosis-formation is detectable⁷ (Plate X, fig. 4). *Tyloses*: present; developing, at least mainly, from the ray-cells (Plate I, Fig. 4); becoming thick-walled, and pitted; often somewhat resinous. *Vessel-contents*: generally none.⁵

⁶ In all cases, the mean and standard deviation of 100 counts and measurements are given, as only one example of the wood is available (see Rendle and Clarke, 10, Table II, p. 36; also 9). The numerical standards proposed by Chattaway (3) are used in the description and measurement of microscopical features, except in the case of vessel-element length. In this instance (as in the writer's description of *Monotes Kerstingii* [1, footnote, p. 235]) the *total* length of each element, including "tails" where these are present, is considered, since, as Chalk and Chattaway have recently shown (2), this measurement probably has "phylogenetic significance through its relation to the cambial initial."

⁷ These large vessel-ray pits have been found in all *Monotoid* species so far examined, being comparatively distinct in *radial sections* of the wood, where they are, of course, seen in *surface view* (see 1, p. 236). Owing to their minute size, and to the difficulty of cutting these very hard woods without tearing, it has been impossible to detect the apertures in *section* with any degree of certainty. They are often obscure, even in surface view, owing to the resinous contents of the ray-cells; but they undoubtedly have a connection with the formation of tyloses by the ray-cells, both in this specimen of *Marq. acuminata*, and in a specimen (I.F.I. 4216) which is in all probability *Marq. macroura*. A similar connection between these large "pits" and tylosis-formation has now been noted in *Monotes Kerstingii*.

TRACHEIDS—none observed.

FIBRE-TRACHEIDS—typical examples somewhat wider and thinner-walled than true libriform fibres; elongated, similar in length to the fibres, tapering and pointed at ends; pitted throughout length generally; pits bordered, with narrow oblique apertures. Transitions to true fibres occur.

FIBRES—*Arrangement*: forming main ground-mass of wood; generally irregular as seen in transverse section; occasionally a few rows at the end of a growth-ring may show a more regular, radial arrangement. Course of fibres, vertical to locally oblique and irregular; occasionally fibres turn almost at right angles at the margin of a ray. *Shape*: variable in transverse section; elongated, tapering gradually; generally sharply pointed. *Length*: short; 1.088 ± 0.209 mm. *Walls*: thick to very thick; not varying appreciably in early and late wood. *Lumina*: small to very small, in comparison with thickness of walls; rounded, elliptical or slit-like in transverse section, according to outline of element. *Pits*: on all walls, and throughout length, except in the case of elements with very slender-pointed ends; bordered, with oblique to nearly vertical slit-like apertures. *Septation*: absent. *Contents*: generally none.* (See footnote 5.)

PARENCHYMA—*Amount*: somewhat variable; on the whole fairly abundant. *Arrangement*: *metatracheal*—diffuse, with very occasional tendency to tangential alignment in short, uniseriate rows of 3 or 4, or sometimes more, cells; or occasionally in small groups of 3 or 4 cells; *paratracheal*—present in small and variable amount; never forming complete sheaths round the vessels. *Appearance of the cells*: in *transverse section*—somewhat variable in size, often rather large, rounded to irregular in shape; in *longitudinal section*—fairly conspicuous in radial section, less so in tangential section; typically in short single vertical series, in which cambiform rows are not generally obvious, though occasionally a row of 4 cells may be seen; cells elongated vertically, though variably so; end walls mainly horizontal. *Pits*: small, simple; not numerous, generally obscure owing to cell-contents; rounded to elliptical in shape; inter-parenchyma pits (on end walls) not grouped. *Crystal bearing cells*: absent. *Cell-contents*: variably resinous.

RAYs—*Arrangement*: closely-set and very numerous, 16 ± 1.7 per mm.; deflected by, and contiguous to, vessels, or separated from them by 1 or 2, or occasionally more, series of ground-tissue elements: non-storeyed. *Shape and size*: narrowly spindle-shaped in tangential section of wood; extremely fine; generally uniseriate, about 14 per cent. locally biseriate, $13 \pm 3.3\mu$ in width; extremely low, from 2–31, frequently 11–13 cells, and $220 \pm 110\mu$ in height. *Ray-type, and shape of ray-cells*: slightly heterogeneous; in *transverse section*—cells generally radially elongated, though variably so, often compressed by contour of vessels; in *tangential section*—marginal cells oval, body cells rounded or elliptical to (generally) squarish; in *radial section*—cells generally horizontally elongated, but shorter

at ends of growth rings; upper and lower marginal cells more variable than others. End walls of cells upright to inclined, sometimes curved. *Walls*: comparatively thick. *Pits*: simple, on all walls; numerous on end walls; rounded or elliptical in shape; generally small, but much larger on walls of one or two series at upper and lower margins, and also on walls of certain central body cells of higher rays, where these are in contact with vessels. In some cases, the connection between these large pits and tylosis-formation is clearly seen. *Contents*: resinous.

DISCUSSION.

Six authenticated species of Monotoid timbers—*Marquesia acuminata* (Gilg) R. E. Fr., *Marq. macroura* Gilg, *Monotes Kerstingii* Gilg, *M. africanus* (Welw.) A. DC., *M. glaber* Sprague, and *M. tomentellus* Hutch.—and three as yet unidentified species (from Nyasaland and Tanganyika) have now been examined; the first four species have afforded mature material, and for these, detailed calculations of size of vessels, fibres and rays, and of distribution of vessels and rays, have been made.

The timbers are remarkably uniform in physical properties and in general structure, being characterised by considerable hardness and density, a light, somewhat reddish-brown colour, slight lustre, and a lack of "patterning": on the transverse surface, on account of the fineness of the structure and the even distribution of the vessels and parenchyma, and on the longitudinal surfaces, owing largely to the extremely low and narrow, non-storeyed rays. Secretory canals are absent, though resin occurs in the tissues. There is also uniformity in the detailed structure of the Monotoid species so far examined, the ground-mass of the wood being composed of thick-walled fibres, with only a small amount of paratracheal and diffuse metatracheal parenchyma; the rays are very numerous, extremely fine (uniseriate, with a small and variable percentage of locally biseriate examples) and extremely low, not reaching 0.5 mm. in height; the fibres are short, a little under or over 1 mm. in length, non-septate, and possessing small bordered pits on all walls; the vessels are predominantly scattered and solitary, there being only a small percentage of vessel-pairs, while groups of more than two vessels are rare; the vessel-elements are short, completely perforate, with or without "tails" at one or both ends, and the comparatively thin walls are finely pitted with non-contiguous, and generally plainly bordered pits; there is a general tendency to the formation of thick-walled tyloses, chiefly from the marginal ray-cells, their production apparently being facilitated at these points by the presence of comparatively large vessel-ray pit-pairs.

The variations observed with regard to the foregoing features are so inconsiderable that no one of them, or combination of them, can be used diagnostically to distinguish between the various

species examined in detail.⁸ There are two points, however, which at first sight might appear to offer diagnostic data: these are the numerical distribution of the vessels, and their size, in which features the greatest amount of difference between the species seems to lie.

Species	Numerical Distribution of Vessels	Size of Vessels	
		Tangential Diameter	Radial Diameter
1. <i>Marquesia acuminata</i> (Gilg) R. E. Fr. (I.F.I. 6881)	42±5 per sq. mm. Very numerous	53±12μ Very small	89±26μ to small
2. <i>Marquesia macroura</i> Gilg (I.F.I. 7981)	9±2 per sq. mm. Moderately numerous to moderately few	99±22μ Small to moderate sized	162±37μ
3. <i>Monotes Kerstingii</i> (Gilg) (Vigne 3000)	21±3 per sq. mm. Numerous to moderately numerous	61±15μ Very small to small	98±20μ
. <i>Monotes africanus</i> (Welw.) A.D.C. (I.F.I. 7980)	21±3 per sq. mm. Numerous to moderately numerous	73±15μ Small	107±26μ

Table I

In the case of the four species for which detailed calculations have been made, it will be seen from Table I that the vessels vary (1) in numerical distribution from "very numerous" (in *Marq. acuminata*) to "moderately few" (in *Marq. macroura*); and (2) in diameter from "very small" (in *Marq. acuminata*) to "moderate-sized" (in *Marq. macroura*).

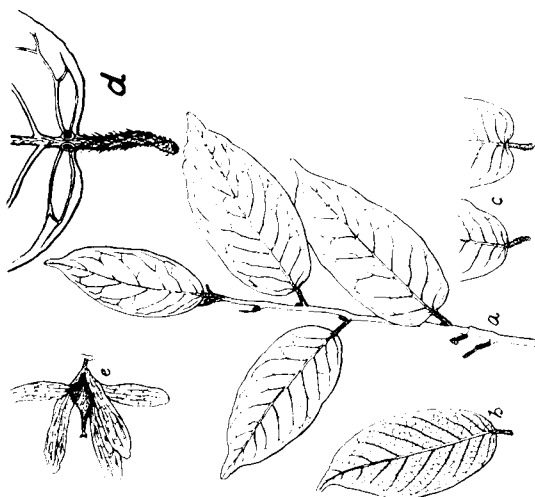
The first point, however, presents a *tissue variation*; and tissue variations, being apparently more intimately bound up with conditions of growth than *variations in the individual cells*, cannot be

⁸ The available wood of *Monotes glaber* and of *M. tomenellus* was too immature to make comparison practicable.



Fig. 6. Habit of *Marquesia acuminata*.
Mature tree with younger ones beneath it.

Photo. by G. C. Trapnell.



MARQUESIA ACUMINATA [GILG] R.E.F.R.

Fig. 5.

- a.* A shoot, showing the upper surface of the leaves.
b. The lower surface of a leaf, showing the venation and the general absence of tomentum.
c. The bases of two leaves, demonstrating variation in shape.
d. The base of a leaf, showing the paired glands on the upper surface.
e. A fruit.
(a, b and c, slightly more than 1/4 natural size; d slightly more than 1/2 natural size; e, slightly less than natural size).
 (From a drawing by Miss Jean Dickson.)

considered as completely reliable for diagnostic purposes (*cf.* 10, p. 33). The actual size of the vessels thus remains to be examined as a possible distinguishing feature between the four species. The tangential diameter of the vessels is generally regarded as being less variable than the radial diameter, and this alone need be considered here. A glance at the means and standard deviations of this dimension for the four species (Table 1) shows a gradation from $53 \pm 12\mu$ in *Marq. acuminata*, to $99 \pm 22\mu$ in *Marq. macroura*, the figure in the latter being rather outstandingly high in the series. It is clear that vessel-diameter could not safely be used to distinguish between species 1, 3 and 4 in the list; but as a distinction between *Marq. macroura* on the one hand, and any one of the three other species on the other, it might possibly be of service. According to Rendle and Clarke, however, unless the mean sizes of an element in two species differ by not less than 3.5 times the standard deviation of the elements of either species, vessel-size should not be used diagnostically (10, p. 32); and calculations on this basis show that the vessel-size of *Marq. macroura* cannot reasonably be employed as a means of distinguishing between this species and any of the other three.

It therefore appears that while, as a group, the Monotoideae are very coherent and may be easily identified by their wood-anatomy, no one structural feature or combination of features will serve with certainty to define the various species so far examined.

In conclusion it may be noted that the evidence so far provided by wood anatomy strongly upholds Gilg's opinion, drawn from floral and various vegetative characters, that the Monotoideae should be included in the Dipterocarpaceae, rather than in the Tiliaceae (7); this point is discussed in some detail elsewhere.⁹

The writer wishes to express her very grateful thanks to the Director of the Royal Botanic Gardens, Kew, Dr. W. Robyns of Brussels, Dr. J. Burt Davy, and Mr. Duncan Stevenson, for their very kind co-operation in the obtaining and authenticating of the material here described; to Mr. E. W. B. H. Milne-Redhead, Mr. C. G. Trapnell, and Mr. C. E. Duff, for field-notes; to Dr. C. R. Metcalfe, for information concerning the Kew wood-specimen of *Marquesia acuminata*; to Professor R. S. Troup, for permission to work in the Imperial Forestry Institute, and to the Christopher Welch Trustees and the British Association, for grants without which it would not be possible to carry out these researches; and to Miss Jean Dickson, Mr. C. G. Trapnell and Mr. A. L. Clinkard, for the drawing and photographs used in illustration of this paper.

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XXXIX—NEW OR NOTEWORTHY SOUTH AFRICAN PLANTS.*—VII. J. BURTT DAVY.

RUBIACEAE.

121. *Canthium foliosum* Burtt Davy, comb. nov. *Plectronia foliosa* Burtt Davy in Kew Bull. 1921, 191.
TRANSVAAL. Waterberg District: at Warm Baths, c. 1080 m., Burtt Davy 5161 in Bolus herb. (type).
122. *Canthium Junodii* Burtt Davy, comb. nov. *Plectronia Junodii* Burtt Davy in Kew Bull. 1921, 192.
TRANSVAAL. Pietersburg District: Shilouvane, "ravin du Masetane," Junod 720 in Kew herb. (type). Extends through Mozambique Territory to Nyasaland.
123. *Canthium ovatum* Burtt Davy, comb. nov. *Plectronia ovata* Burtt Davy in Kew Bull. 1921, 191.
TRANSVAAL. Barberton District: near Barberton, Legge 1729 in Bolus herb. (type); Legge 1728 in National herb. Pretoria.

COMPOSITAE.

124. *Coreopsis Schlechteri* Burtt Davy, comb. nov. *Bidens Schlechteri* Sherff in Bot. Gaz. **76**, 146 (1923).
TRANSVAAL. Pietersburg District: Houtboschberg, Schlechter 4745 (type). Also in the Barberton District.

* Continued from K.B. 1924, 235.

125. *Gynura picridifolia* Burtt Davy, sp. nov.; *Senecio picridifolius* Harv. in Fl. Cap. **3**, 379 *partim*, non DC.; affinis *S. picridifolio* DC., sed styli ramis appendiculatis, caule folisque glabrioribus differt.

Folia anguste lanceolata, acuta vel acuminata, late repandodentata vel lobulata, superiora sessilia, distincte auriculata. *Capitula* pauca longipedunculata; corolla flava.

TRANSVAAL. Pretoria District: Groenkloof, near Pretoria, along water-furrow, Burtt Davy 18809 in Kew herb.

Also in the eastern Cape Province, Natal, Lourenço Marques Province (Portuguese East Africa), S. Rhodesia, Katanga Province (Belgian Congo), and Uganda.

This plant superficially resembles *Senecio picridifolius* DC., differing, however, in the appendages to the style-arms and in being less scaberrulous. In describing the plants which he referred to *Senecio picridifolius* DC., Harvey observed that "the natural affinities of this species are to me very doubtful"; it has been found necessary to refer all of the specimens cited by him, excepting the type, to the genus *Gynura*.

126. *Kleinia barbertonica* Burtt Davy, comb. nov. *Senecio barbertonicus* Klatt in Bull. Herb. Boiss. **4**, 840 (1896). *Senecio Gilgianus* Muschl. in Engl. Bot. Jahrb. **43**, 62 (1909).

TRANSVAAL. Barberton District: Highland Creek, near Barberton, Galpin 1000 (type). Also in Southern Rhodesia, near Bulawayo, Eyles 1239 (type of *S. Gilgianus* Muschl.).

127. *Euryops laxis* Burtt Davy, comb. nov. *Gamolepis laxa* Harv. in Harv. and Sond. Fl. Cap. **3**, 158 (1865).

NATAL. Zululand: without precise locality, Gervard 1015 (type). Also in the Transvaal, Orange Free State, and Griqualand East.

This species clearly connects *Euryops* with *Gamolepis*. Some flowering specimens show a distinct pappus; in others this is rudimentary, or deciduous or absent. In the type specimens the achenes are too old to show pappus.

128. *Cotula microcephala* DC. var. *pilosa* Burtt Davy, comb. nov. *C. anthemoides* var. *pilosa* Harv. in Harv. and Sond. Fl. Cap. **3**, 182 (1865). *C. anthemoides* Willd. non Linn.

CAPE PROVINCE. Beaufort West Division: between Beaufort West and Rhinosterkop, Drège. Also in the Transvaal.

The typical form (*C. microcephala* DC.; *C. anthemoides* var. *glabriuscula* Harv.) ranges from the Cape Province to Angola and Abyssinia.

129. *Aster luteus* Hutchinson, comb. nov. *Felicia lutea* N.E. Brown in Kew Bull. 1901, 123. *Detris ericifolia* var. ? *anthemoides* Hiern, Cat. Pl. Welw. **1**, pt. 3, 546 (1898).

NATAL. Zululand: Amatikulu, below 1000 ft. alt., Wylie in herb. Wood 7592 (type).

ANGOLA. Mossamedes: on damp sands along banks of river Bero, abundant, Welwitsch 3435 (type of *D. ericifolia* var. ? *anthemoides*).

130. *Aster Harveyanus* O. Ktze. Rev. Gen. 316 (1891). *Diplopappus serrulatus* Harv. in Harv. and Sond. Fl. Cap. 3, 86 (1865) (not *Aster serrulatus* Harv.). *Aster xylophyllus* Klatt in Bull. Herb. Boiss. 4, 831 (1896), and *A. serrulatus* var. *xylophyllus* Klatt in Bull. Herb. Boiss. 6, 562 (1898).

TRANSVAAL. Pretoria District: at the Magaliesberg, Burke sine numero, Zeyher 800 (types); Barberton District: hillside at Barberton, 2850 ft., Sept. 1890, Galpin 1032 (type of *A. xylophyllus*). Also in Natal.

131. *Aster pleiocephalus* Hutchinson, sp. nov. *Diplopappus asper* var. *pleiocephalus* Harv. in Harv. and Sond. Fl. Cap. 3, 85 (1865); ab *A. aspero* Less. capitulis corymbosis, involucri bracteae glabris differt.

Herba perennis usque ad 0.75 m. alta; caules strigoso-pilosi. *Folia* linearia, integra vel pauci-dentata, 4-6 cm. longa, usque ad 8 mm. lata triplinervia, utrinque pilis basi bulbosis parce strigosa. *Capitula* pauca, laxa corymbosa, depresso-globosa, circiter 1.5 cm. diametro (radiis exclusis); pedunculi graciles. *Involucri bracteae* 3-4-seriatae, lineares, acutae, glabrae, margine brevissime ciliolatae. *Flores* radii albi, disci flavi. *Achaenia* pubescentia, pappo pallide stramineo coronata.

NATAL. Klip River County: near Ladysmith; Umvoti County: Greytown, Gerrard and McKen 340 and 1009 (types). Also in Zululand, the Transvaal, Orange Free State, and Griqualand East.

132. *Philyrophyllum alatum* Burt Davy, comb. nov. *Pentatrichia alata* S. Moore in Journ. Bot. 55, 106 (1917).

TRANSVAAL. Lydenburg District: Pilgrim's Rest, Rogers 18667 (type).

133. *Inula paniculata* Burt Davy, comb. nov. *Monactinocephalus paniculatus* Klatt in Bull. Herb. Boiss. 4, 474 (1896).

TRANSVAAL. Pietersburg District: Houtboschberg, Rehmann 6068 (type of Klatt's genus and species). Also in Southern Rhodesia.

134. *Helichrysum declinatum* Less. Syn. Gen. Comp. 278 (1832). *Amphidoxa gnaphalodes* DC. Prodr. 6, 246 (1837). *Gnaphalium micranthum* Thunb. Prodr. Pl. Cap. 149 (fide Moeser: non *Helichrysum micranthum* A. Cunn.).

TRANSVAAL. Widely distributed from the Drakensberg to the Bechuanaland border. Also in Natal, the Cape Province, British Bechuanaland, the Bechuanaland Protectorate, Southern Rhodesia, Kenya Colony, and Uganda.

135. *Berkheya echinacea* Burt Davy, comb. nov. *Stobaea echinacea* Harv. in Harv. and Sond. Fl. Cap. 3, 495 (1865). *S. Gerrardii* Harv. l.c.

NATAL. Zululand: dry plains, without precise locality, Gerrard and McKen 1045 (type); Emyati, Gerrard and McKen 1046 (type of *S. Gerrardii*).

TRANSVAAL. Common on grassy slopes of the Highveld and eastern mountains.

136. *Berkheya rhapontica* Hutch. et Burt Davy, comb. nov. *Stobaea rhapontica* DC. Prodr. 6, 519 (1837); Harv. in Harv. and Sond. Fl. Cap. 3, 494 (1865).

NATAL. Durban County: Port Natal, Drège sine numero (type). Also in Swaziland, the Orange Free State, and eastern districts of the Cape Province.

137. *Berkheya Radula* Burt Davy, comb. nov. *Stobaea Radula* Harv. in Harv. and Sond. Fl. Cap. 3, 491 (1865). *Berkheya Adlamii* Hook.f. in Bot. Mag. t. 7514 (1897).

TRANSVAAL. Pretoria District: Magaliesberg, Burke sine numero, Zeyher 981 (twin types). Also in Griqualand West, and Southern Rhodesia.

138. *Berkheya onopordifolia* Burt Davy, comb. nov. *Stobaea onopordifolia* DC. Prodr. 6, 521 (1837).

CAPE PROVINCE. Zwartberg, Stormberg, and Wittebergen, Drège sine numero (types). Also on the Transvaal High-veld and in the Orange Free State.

139. *Berkheyopsis linearifolia* Burt Davy, comb. nov. *Gazania linearifolia* Bolus in Trans. S. Afr. Phil. Soc. 16, 395 (1906).

TRANSVAAL. Lydenburg District: Belfast, Bolus 12067 (type).

140. *Berkheyopsis bechuanensis* S. Moore in Journ. of Bot. 51, 185 (1913). *B. Rehmannii* Thell. in Vierteljahrsschr. Nat. Ges. Zürich, 61, 461 (1916).

BECHUANALAND PROTECTORATE: near Magalapye, Rogers 6106 (type). Also in Southern Rhodesia.

TRANSVAAL. Waterberg District: Elands River near Klippan, and at Streydpoort, Rehmann 4962, 5078 and 5453 (types of *B. Rehmannii* Thell.).

Some of the Transvaal material has been referred to *B. Kuntzei* O. Hoffm. but that species is described as having the leaves glandular-pilose beneath, which does not apply to our plant.

141. *Gazania pygmaea* Sond. in Linnaea 23, 69 (1850). *G. canescens* Harv. in Harv. and Sond. Fl. Cap. 3, 478 (1865).

TRANSVAAL. Pretoria District: Magaliesberg, *Burke* and *Zeyher* sine numero (types).

ORANGE FREE STATE: *Cooper* 719 (type of *G. canescens* Harv.). Also in Natal, the eastern districts of the Cape Province, British Bechuanaland, Southern Rhodesia, Angola, Portuguese E. Africa, and Nyasaland.

After studying a large series of specimens it appears that the Transvaal material, which has been variously referred to *Gazania serrulata* DC., *G. longifolia* Less., *G. longiscapa* DC., and *G. Krebsiana* Less., represents but a single, somewhat variable species. Both glabrous and hispid leaves are found on the same plant (e.g. *Burke's* type; *Bolus* 7825 and 10907, and *Galpin* 975). So also, heads with outer involucre bracts shorter than, or longer than, the inner, are found on the same plant.

This is an ornamental, dwarf species, showing considerable range in size and colour of flowers; it is quite worth cultivation. It stands fairly severe frosts, though as these occur in the long dry season it is uncertain whether it would tolerate wet cold. There is a handsome form with yellow flowers, and dark spots at base of the ligules (var. *maculata* N.E. Brown).

XL—CONTRIBUTIONS TO THE FLORA OF BURMA: **XII*—C. E. C. FISCHER.**

N.B.—The regions shown within brackets are those whence the species has been previously reported.

Schisandra axillaris Hook.f. et T. [Magnoliaceae].
(Khasia Hills.)

Maymyo District: Singaung, fls. Aug., *Ba Pe* per C. E. Parkinson 12176.

Alphonsea glabrifolia Craib [Annonaceae].
(Siam.)

Maymyo District: Gokteik viaduct, *Po Khant* per C. E. Parkinson 12435.

Goniothalamus burmanicus C. E. C. Fischer, sp. nov. [Annonaceae]: a *G. macrantho* (Kurz) Boerl. ramulis hornotinis pubescentibus, foliorum longiorum costa supra pubescente, pedicellis brevioribus, sepalis brevioribus erectis adpresse strigosis, petalis interioribus majoribus distinctus.

A shrub 2 m. high; branchlets terete, brown, bark reticulately rugulose; youngest twigs adpressed chocolate-brown pubescent. Leaves oblong, elliptic-oblong or lanceolate-oblong, acute or acuminate, narrowed to the rounded base, 14–32 cm. long, 4.5–8 cm. wide, midrib deeply impressed and pubescent above, prominent below, primary nerves 14–25 pairs, regular, ascending, slightly curved and

anastomosing near the margins, secondary nerves more or less regularly scalariform between the primaries, brown when dry, somewhat glaucous below and more or less puberulous on the midrib and nerves. Petioles terete, 7–12 mm. long, brown-puberulous. Flowers, long, solitary, supra-axillary, white. Pedicel thick, 4–4.5 mm. long, densely adpressed brown-strigose; bract at its base shorter, lanceolate, brown-strigose. Sepals 3, erect, thickly coriaceous, ovate, subacute, more or less keeled, 8 mm. long, adpressed brown-strigose. Petals 6: 3 outer free, thinly coriaceous, linear-lanceolate, obtuse, 5–6.5 cm. long, 8–9 mm. wide at the base, thinly puberulous on both sides, pustulate at the base outside, midrib prominent outside; 3 inner thickly coriaceous, lanceolate, subacute, base narrowed and rounded, 2.2–2.8 cm. long, valvate and firmly cohering in the upper half, separated below by a large triangular hiatus, puberulous, pustulate at the base outside. Torus truncately conical, 2.5 mm. high, shortly brown-hairy at the apex. Stamens densely packed 1.7–2 mm. long, narrowly obcuneate, apex flat, connective concealing the anthers. Ovaries about 12, linear, 2.2 mm. long, densely brown-hairy; ovule solitary, erect from the base, subcircular, flat; style 2 mm. long, terete, slightly widened to the rounded apex, rather wider than the ovary, usually curved, yellowish-brown (when dry), minutely papillose.

North Toungoo District, East Swa Reserve, fls. May, *Maung Ba Pe* per C. E. Parkinson 8544.

Garcinia paniculata Roxb. [Guttiferae].

(Bhutan and Khasia Hills.)

Sandoway District: Arakan Yoma, fls. white, Jan., *Ba Pe* per C. E. Parkinson 11938. Tree 60 ft. high.

Hibiscus grewiaefolius Hassk. [Malvaceae].

(Malaya.)

Mergui District: Tenasserim, Sindin, 50 ft. fls. bright-yellow turning purplish red after falling, Nov., *Sukoe* per C. E. Parkinson 10148; Tharabwin, 50 ft., *Sukoe* per C. E. Parkinson 10162; Tharabwin chaung-pya, frt. green, Feb., *Po Khant* per C. E. Parkinson 11308. Vern. names: *thit-sho*, *bawthane*, *bawthanaw*.

Desmodium reticulatum Champ. [Papilionaceae].

(W. China.)

N. Toungoo, Kunmyaung Saing, Yoma Reserve frt. Nov., *Ba Pe* per C. E. Parkinson 8282. 18 in. high.

Mastixia arborea C. B. Clarke [Cornaceae].

(Cachar, S. India, Ceylon, Siam.)

Myitkyina District, Mawhan, fls. light-yellow, May, *Ba Pe* per C. E. Parkinson 12141.

* Continued from K. B. 1933, 366.

Vernonia hyalina C. E. C. Fischer [Compositae] published in K.B. 1927, 91 is **Microglossa volubilis** A.DC.

Androsace Gagnepainiana Hand.-Mazz. [Primulaceae].
(Assam, Yunnan.)

Seinghku Wang, 28° 8' N, 97° 24' E, 13,000 ft., fls. white, sometimes with a pink, sometimes with a green eye, or faintly pink with a yellow eye, July, *F. Kingdon Ward* 6843, "on mossy boulders in open meadows"; *F. Kingdon Ward* 7025, "on grassy ledges of granite cliffs"; *F. Kingdon Ward* 7082, "on meadow-clad slopes at the foot of granite cliffs."

Scolopia Kermodei C. E. C. Fischer, sp. nov. [Flacourtiaceae]; *S. spinosae* Warb. affinis, ramulis inflorescentisque glabris, pedicellis infra medium articulatis, floribus majoribus differt.

A glabrous tree up to 80 ft. tall (fide Maung Kan); main stem thorny; branchlets greyish-brown, shallowly furrowed; twigs reddish-brown, lenticellate, glabrous. *Leaves* thinly coriaceous, broadly ovate to obovate or elliptic-lanceolate, acute or acutely long-acuminate, rarely rounded, base usually acute, sometimes rounded, shining, 7-19 cm. long, 3-6.8 cm. wide, base subtriply-nerved, secondary nerves 7-12, slender, reticulations fine on both faces, midrib, nerves and reticulations slightly raised below; petioles 8-18 mm. long, shallowly channelled above, more or less rugulose, bearing a small rounded gland on either side at the apex. *Racemes* axillary; rhachis not very slender, up to 10 cm. long, glabrous, often drying black; pedicels 7-15 mm. long, glabrous, articulate a little above the base, subtended by a linear-ensiform, acute, glabrous, shortly ciliate bract which usually overtops the joint. *Sepals* 6-8, broadly ovate to subcircular, glabrous, fleshy except the ciliolate margins, 2-3 mm. long. *Petals* 6-8, oblong, rounded, glabrous, fleshy except the ciliolate margins, 1.9-2.5 mm. long. *Disc* cushion-shaped, rather thick, 4.5-5 mm. diam., shortly hairy. *Stamens* very numerous; filaments filiform, 4-7 mm. long; anthers oblong, 1 mm. long. *Ovary* ellipsoid, glabrous, 3.5-4.3 mm. long, 1-celled with 4 parietal placentae, ovules many, subdiscoid. style columnar, about as long as the ovary, apex 4-lobed or more or less deeply 4-fid. *Fruit* (hardly ripe) obovoid, tipped by the persistent style, 1.5-2 cm. long; seeds 3-4, flat.

Bassein District: Ridge-top East of Kanazogon Village, West Coast, 500 ft. fls. Jan., C. W. D. *Kermode* 7109 (type in Kew Herb.): "tree 30 ft. high with white flowers, vernacular name "thabye"; near Simma village, 100 ft., C. W. D. *Kermode* 7128; Kanyin Chaung, 50 ft., *Maung Kan* 7001, vernacular name "kyettet"; Kalayaung, fls. white Feb., C. E. *Parkinson* 8803, "tree 25 ft. high by the sea-shore." Myaungnya District: Lebzauk Reserve, frt. March, J. H. *Lace* 2987. Insein District: Rangoon, fls. March, R. N. *Parker* 2778, "small tree with thorns on the main stem." North Hlaing Yo Ma Reserve, *Ba Pe* 11623. North Toungoo

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District: Sa Mo Reserve, *Ba Pe* 9366. Andaman Islands: Bamboo flat, Port Blair, fls. March, C. E. *Parkinson* 419; Rutland Island, fls. Jan., C. E. *Parkinson* 874; Weinkedleygung, fls. Feb., C. E. *Parkinson* 902 (a).

At first it was thought that this must be Kurz's *Scolopia lucida* published in the Forest Flora of British Burma, 1, 73, as the fruit seemed to agree with Kurz's description, but comparison with Kurz's type sheet (by the courtesy of the Director of the Botanical Gardens at Sibpur) which bears the Wall. Cat. No. 7245 (of which a more complete sheet is in the Wallich Herbarium at Kew), showed that the two are distinct. The Wallichian sheets are devoid of flowers; the leaves resemble those of *S. spinosa* Ward. and the fruit stalks show a remainder of indumentum resembling that of the same species. In view of the shape of the fruit, however, I hesitate to unite the two. There is no mention whatever of *S. lucida* Kurz in the Fl. Br. Ind. so that Hooker's opinion on the question is not known.

Adhatoda oreophila (*Justicia oreophila* C. B. Clarke) C. E. C. Fischer, comb. nov., var. **magna** C. E. C. Fischer, var. nov. [Acanthaceae]; a typo foliis majoribus minus pubescentibus, bracteis densioribus multo majoribus differt.

Shrub 1 m. high, terminal twigs 2-edged by decurrent ridges from the petioles, more or less 4-ribbed, adpressed puberulous. *Leaves* elliptic, abruptly acuminate at both ends, decurrent on the petioles, 10-24 cm. long, 4.5-12 cm. wide, midrib slightly raised on both faces, primary nerves 10-13 pairs, very regular, arising from the midrib at an angle of 60-72°, arching evenly upwards, anastomosing near the subundulate margins, puberulous on both faces; petioles 2-4.5 cm. long, adpressed puberulous. *Peduncles* axillary, 5-6.5 cm. long, obtusely 4-ribbed, adpressed puberulous. *Spikes* dense, 6-9 cm. long, about 3 cm. wide. *Bracts* more or less 4-ranked, broadly falcate to rotund-ovate, subacute, 2-3.5 cm. long, 1.2-2.2 cm. wide, 5-nerved from the base, the 2 outer rather faint, reticulate between; pubescent and punctulate on both faces, 1-flowered. *Bracteoles* oblanceolate-spathulate, obtuse, narrowed into a short broad petiole; nearly as long as the bract, 5 mm. wide, venation, pubescence and dotting as of the bracts. *Calyx* 6-6.5 mm. long, divided nearly to the base into 5 subequal, narrowly lanceolate, acuminate, 3-nerved segments, pubescent and punctulate like the bracts. *Corolla* nearly concealed by the bract and bracteoles, 1.6 cm. long, pubescent without, white with maroon streaks in the throat; tube 7.5 mm. long; limb deeply 2-lipped; upper lip oblong, slightly concave, notched at the apex; lower lip deeply 3-lobed, median lobe broadly oblong, rounded, lateral oblanceolate, obtuse. *Stamens*: *filaments* subulate, thick, hollow, 9-10 mm. long, bases and 2 adjacent ribs on the corolla tube hispid; *anthers* linear-oblong, 4 mm. long, base divaricate, acute but not spurred, polliferous throughout. *Disc* annular, thin, 1.25 mm. deep. *Ovary* ovoid, compressed, 2.5 mm. long, hispidulous at the apex; *ovules* 2 in each

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cell; *style* filiform, slightly thickened upwards, 1.25 cm. long, hispidulous at the base. *Capsule* clavate, laterally compressed, obtusely shortly beaked, 1.75 cm. long, base hollow but empty, hispidulous at the apex. *Seeds* 2-4, rotund-ovate, flat, 5-6 mm. long, pale, glabrous, reticulately rugose.

Maymyo Plateau, Gokteik, 2300 ft., fls. & frt. Sept., C. E. Parkinson 11223 (type in Herb. Kew.).

C. B. Clarke's description of *Justicia oreophila* in Fl. Brit. Ind. 4, 526 is based on a single sheet collected in Chittagong by J. D. Hooker and T. Thomson. On the original label it is determined as *Adhatoda ventricosa* Nees. It will be observed that the description makes no mention of the corolla or stamens and a reference to the specimen reveals that these had all fallen off. It differs from Parkinson's specimen, described rather fully above because the original description is very restricted, only in the characters mentioned in the diagnosis. I have no doubt therefore that were anthers available they would show that the plant is an *Adhatoda* and not a *Justicia*, and I do not hesitate to transfer it to the first named genus.

XLI—MISCELLANEOUS NOTES.

H. BRUINS-LICH.—Mr. H. Bruins-Lich, who left Kew in 1928 and has been successively Horticultural Officer at St. Helena and Curator of the Botanic Gardens at Trinidad, has been appointed Assistant Superintendent of Parks and Sports Fields at Pretoria, South Africa.

DR. MARSHALL A. HOWE.—We learn with interest that the Board of Directors of the New York Botanical Garden has elected Dr. MARSHALL A. HOWE, Ph.D., D.Sc., to succeed Dr. Elmer D. Merrill as Director-in-Chief of the New York Botanical Garden, as from October 1st, 1935. Dr. Howe has been associated with the New York Garden for thirty-four years and has held the position of Assistant-Director for the past twelve years. He is well known to botanists by his algological researches and to horticulturists by his work on dahlias, irises and paeonies.

Dr. H. A. GLEASON has been appointed Deputy-Director, and Mr. HENRY DE LA MONTAGNE, Junr., who has been Business Manager of the New York Botanical Garden since 1930, is to succeed Dr. Marshall Howe as Assistant-Director.

F. A. F. C. WENT.—We record with great regret the death of Prof. F. A. F. C. Went, For.-Mem. Roy. Soc., F.L.S., Professor of Botany and Director of the Botanic Garden at Utrecht, on July 24th, at Wassenaar, near The Hague. Prof. Went was born at Amsterdam on June 18th, 1863. His early botanical training was received under Hugo de Vries and later he worked at Bonn under Stras-

burger and at Paris under Van Tiegham. Between 1891 and 1896 he was Director of the West Java Sugar Experimental Station where he carried out a wide range of researches, mainly on the physiology and pathology of the sugar cane. He was appointed Professor of Botany at Utrecht in 1896.

Prof. Went possessed to an unusual degree the power, whilst engaged in specialized investigations, of retaining a broad outlook on other branches of botany, and of seeing his own subject in relation to other spheres of knowledge. His best-known work was concerned with plant physiology and pathology, but the wide range of his interests can be seen from the fact that, besides publishing, in conjunction with Dr. J. H. Walker, a book on the diseases of sugar cane (1898) and papers on the morphology of *Castilleja elastica* (1896) and *Sciaphila nana* (1909), and on the influence of external conditions on the flowering of *Dendrobium cruminatum* (1915), he also worked on the anatomy and geographical distribution of the *Podostemonaceae* and published two papers on this family in 1924 and 1928. His articles on non-botanical subjects include one dealing with life in Dutch universities (1926).

Some of his physiological papers are concerned with respiration, photosynthesis, and protoplasmic streaming, but his chief interest of recent years was in tropisms and growth. During the last ten years he built up a new conception of the mechanism of plant-growth, which he showed is controlled by a substance (auxin) present in the tips of the coleoptiles of oats and other grasses. He published an excellent summary of this work in English in 1935 (Biological Reviews, 10, 187).

Prof. Went was elected a Foreign Member of the Linnean Society of London, in 1931, and of the Royal Society in 1933. He was a Vice-President of the International Botanical Congress held at Cambridge in 1930 when the Honorary Degree of Sc.D. was conferred upon him. His death just before the holding of the Sixth International Botanical Congress at Amsterdam, over which he was to have presided, was deeply deplored, and many tributes were paid to his memory there by botanists gathered from all parts of the world.

B. L. ROBINSON.—We record with deep regret the death, in his seventy-first year, of Dr. Benjamin Lincoln Robinson, Asa Gray Professor of Systematic Botany and for forty-three years Curator of the Gray Herbarium at Harvard University. Dr. Robinson, who succeeded Sereno Watson in 1892, ably maintained and materially improved the position of this great Herbarium. He edited the continuation of Asa Gray's "Synoptical Flora of North America"; produced, in collaboration with Prof. M. L. Fernald, Gray's "New Manual of Botany," which was an illustrated seventh edition of the famous Manual; and was the editor of "Rhodora" for the first thirty years of the life of this publication.

As a taxonomist, Robinson was the most conspicuous figure among the numerous North American botanists who have been attracted by the *Compositae*. He monographed such genera as *Brickellia*, *Verbesina*, *Porophyllum*, *Melampodium*, *Nocca* and *Rumfordia*, and was associated with Dr. J. M. Greenman in similar revisions of numerous other genera, for example, *Sabazia*, *Tridax* and the Mexican and Central American species of *Hieracium*. These papers usually appeared in the "Proceedings of the American Academy of Arts and Sciences" and were reprinted in the "Contributions from the Gray Herbarium." Of late years Robinson had concentrated on the *Eupatorieae*, and this vast and critical group occupied his attention until his death. Numerous invaluable papers were published, among which special mention must be made of his "Key to the Genera of the *Compositae*—*Eupatorieae*" (1913), and his series of revisions of the *Eupatoria*, *Mikaniae* and *Steviae* of Venezuela, Colombia, Ecuador, Peru and Bolivia. He was gradually preparing a "General Treatment of the *Eupatorieae*," and even a botanist who never met or saw him could tell from the neatness of his annotations and the care with which he sought to interpret the historic types at Kew that no pains were being spared to complete a work of monumental accuracy and thoroughness.

Robinson's great interest in the flora of Mexico and Central America led him to describe many new species belonging to other families. He also undertook in 1902, as a result of the Hopkins-Stanford expedition, an important recension of the Flora of the Galapagos Islands which was published in Proc. Amer. Acad. vol. 38. This included a bibliography, tables of distribution, and notes on the composition and affinities of the flora, and was a distinguished contribution to the botanical history of the archipelago.

Though Robinson's main interests undoubtedly lay in systematic botany, he found time to study the development of the modern novel, which he read rather as an intellectual pursuit than as a recreation. With his passing, yet another link with the pre-Vienna generation of North American botanists has been broken, and a great and scholarly gentleman has gone to his rest.

The valid publication of the combination *Lilium Duchartrei* var. *Farreri*.—This combination having been attributed by some botanists to A. Grove (1925) and by others to K. Krause in Notizbl. Bot. Gart. Berlin, 9, 534 (1926), the question of the correct authority has been referred to the writer for investigation. Those who accepted the later date and author seem to have done so on the ground that the original publication of the combination in 1925 was invalid. It is true that *Lilium Duchartrei* var. *Farreri* A. Grove in Gard. Chron. ser. 3, 78, 69 (1925) was not accompanied by a technical description or by an actual mention of the synonym on which (as will be seen below) it was based, but to those who had

read the various articles and notices concerning *Lilium Farreri* which had appeared in the Gardeners' Chronicle from 1919 onwards, no doubt could arise that *L. Duchartrei* var. *Farreri* A. Grove was intended by its author as a new name for *L. Farreri*. The chief places of mention of *L. Farreri* in Gard. Chron. were in vol. 66, 76 (1919); 67, 281, 284, fig. 133 (1920); 76, 33, 61, fig. 22 (1924).

The rules of botanical nomenclature, however, are concerned with actual facts of publication, not with suppositions, however probable these may seem, and it is therefore fortunate that Grove, when publishing *Lilium Duchartrei* var. *Farreri* gave a reference—to Gard. Chron. July 30, 1921, p. 63—in which the following sentence occurs: "With ample material to hand for comparison, it is possible that further consideration may prove the specific position of the plant as *L. Farreri* to be untenable, but whether it retains that name or is reduced to *L. Duchartrei*, there can be no doubt horticulture is indebted to Farrer for a good garden Lily of dwarf habit." •

The combination *L. Duchartrei* var. *Farreri* was therefore validly published by Grove in 1925, by means of *indirect citation of the synonym concerned*, namely, *L. Farreri*. A parallel case is discussed in Kew Bull. 1934, 136.

It should be emphasized that the present note is concerned solely with nomenclature, no opinion being expressed as to the taxonomic status of *L. Farreri*.

T. A. SPRAGUE.

***Aconitum Nagarum* Stapf and *A. venatorium* Diels.**—In my note "On the Identity of *Aconitum acaule* Diels" (K.B. 1932, 241), I referred to *A. venatorium* Diels as "certainly distinct from any previously described species." Recent examination of the Indian species has shown that this statement is erroneous, for *A. venatorium* has been found to be identical with *A. Nagarum* Stapf, one of the two species described by Stapf from imperfect material and relegated in his monograph to the end of the genus. *A. venatorium* and its variety (K.B. 1932, 244–5) must therefore now receive the following nomenclature:

***Aconitum Nagarum* Stapf** in Ann. Roy. Bot. Gard. Calc. 10 (2), 176 (1905).

A. ferox C. B. Clarke in Journ. Linn. Soc. 25, 3 (1890), non Wall. ex Seringe.

A. venatorium Diels in Notes Roy. Bot. Gard. Edinb. 5, 269 (1912); Airy-Shaw in Kew Bull. 1932, 244.

var. ***ecalcaratum* (Airy-Shaw) Airy-Shaw**, comb. nov.

A. venatorium var. *ecalcaratum* Airy-Shaw in Kew Bull. 1932, 245.

The affinity of *A. Nagarum* is evidently with *A. deinorrhizum*

Stapf and *A. Balfourii* Stapf (subgen. *Tuberaconitum* sect. *Bisma* subsect. *Deinorrhizum* Rapaics), of which it has the habit and homotrichous indumentum.

H. K. AIRY-SHAW.

Biography of John Briquet.*—Soon after the death of Dr. John Briquet in 1931, many notices of his scientific work were published. In this biography, written by his daughter, Briquet's life is viewed from quite a different standpoint. To quote the words of Madame Briquet in a letter recently received—"My daughter . . . wanted to give our family and his many friends at home and abroad a last souvenir of what he had been, not only in science but also in many other directions."

The book contains seven chapters covering the childhood and youth of Briquet; Briquet as a botanist in Geneva; Briquet and botanical nomenclature; Briquet as a traveller; as a soldier; his honours and personal qualities; and finally appreciations of his life and works.

In addition the author has included a list of his botanical works classified in a very useful way: (1) monographic works, (2) works relating specially, or very largely, to the flora of France, (3) morphological, anatomical and biological works. A list, compiled by M. F. Cavillier, of genera and species and subdivisions of species named in honour of Briquet is added. This biography will be greatly valued by all botanists, especially by those who were privileged to know the late Dr. Briquet.

M. L. GREEN.

Chronica Botanica.†—The need for a comprehensive year book of botany has been admirably met by the publication last May of volume 1 of this work. The book is strongly bound and is divided into three sections distinguished by the colour of the cut edges of the leaves, yellow, red, and blue, respectively. The first section includes an introduction on "International Co-operation among Botanists" by Dr. E. D. Merrill, the programme of the Amsterdam Congress, 1935, with portraits of the officers, a "Short History of the International Botanical Congresses" by Dr. A. B. Rendle (pp. 35-40), and an account of "International and Important Congresses, Committees, and Societies" for the years 1934 and 1935 (pp. 41-75).

* "John Briquet (1870-1931)," by Violette Crumière-Briquet. Phanérogamie: Museum National d'Histoire Naturelle, 57 rue Cuvier, Paris (Ve). Price 10 fr. Français.

† "Chronica Botanica Vol." I. Edited by Fr. Verdoorn, Editorial and Publishing Office, P.O. Box 8, Leiden, Holland, 1935. Pp. 447, and numerous portraits and illustrations in text. Price 15 guilders.

The greater part of the volume (pp. 76-333) consists of a "Review of all Branches of Plant Science during 1934." This contains all the scientific and personal news which the editor, Dr. Verdoorn, collected until the end of January, 1935, and is stated to be at the same time "an exhaustive and up-to-date address list of all Institutions and Societies." Among the illustrations accompanying this section are reproductions of photographs of *Cytinus hypocistis* as grown in the Botanic Garden, Innsbruck, and of *Rubus arcticus* cultivated in the Botanic Garden, Tartu, besides many portraits of deceased and other botanists, and views of new buildings such as that of the Fan Memorial Institute of Biology, Peiping. Among noteworthy illustrations are those of the replica of Clusius' garden in the University Botanic Garden, Leiden, and a view in upper Tshilik (U.S.S.R.).

The most important feature of the third section is the list of "New and Changed Addresses" (pp. 345-378), which forms an indispensable Supplement to the International Address book of Botanists. This appears to be very up-to-date. The few pages (334-342) devoted to "Correspondence" are distinctly stimulating, and this feature might with advantage be enlarged—but that depends on the energy and ability of correspondents. The "Chronica" certainly forms an ideal medium for the ventilation of a legitimate botanical grievance, since it reaches most of the botanists who are in a position to redress it.

The enormous amount of work required for the preparation of the volume can be appreciated only as a result of extended study of its contents. According to an editorial statement, there are nearly 4,000 institutions of pure and applied botany, between 60,000 and 70,000 botanists, and about 1,000 periodicals concerned with botany. In the interests of the science it is to be hoped that botanists generally will give adequate support to the "Chronica Botanica" which is the first modern periodical to give a record of current activity in all branches of botany.

T. A. SPRAGUE.

The Cool Greenhouse.*—In this volume the author describes cultural methods for growing as annuals a great variety of plants that can be used by amateurs to stock a cool greenhouse throughout the year. The directions given are based largely on the experience of Mr. Sutton's head gardener, Mr. F. Townsend, during a quarter of a century in the service of the former's father, the late Mr. Leonard Sutton.

Much space is devoted to South African species such as *Dimorphotheca*, *Gazania*, *Arctotis*, *Ursinia*, and their recent hybrids. One of the most useful features is the concluding reference table, giving the time of sowing and of flowering, and the height of the

* By L. N. Sutton. Putnam, London, 1935. Pp. xii+186, figs. 34. Price 5/-.

species dealt with. Mr. Sutton's book, which is illustrated by photographs of views in his own greenhouses, should prove of great value to both amateur and professional gardeners.

Wild Flowers of Newfoundland.*—This work is being published in five parts, each of pocket size, and is described by the author as being "the first attempt to publish part of an illustrated collection of the Wild Flowers of Newfoundland."

The arrangement follows Gray's Manual, and part 3, the first to be published, contains over 200 illustrations, "mainly orchis, willow, buttercup, mustard and rose." A number of species not illustrated is mentioned, often with no description. The addition of diagnostic characters in these cases would have added considerably to the value of the book.

The nomenclature is on the whole satisfactory, and the volume will no doubt be appreciated by amateur botanists in Newfoundland.

Lilies, their Culture and Management.†—This work is the joint production of an enthusiastic and erudite amateur and of a cultivator of mature experience, assisted, as the preface indicates, by the advice and help of experts in special subjects. The volume is divided into two parts. The first deals with the structure of lilies, their propagation, cultural requirements, hybridisation and diseases, while the second is mainly devoted to a lengthy chapter entitled "Lilies of the World," this being an account of all known species, varieties and hybrids, arranged alphabetically.

The first part, designed primarily for garden lovers, gives up-to-date information on the respective subjects and is assured of a warm welcome. The second provides a most useful descriptive list, the wide range covered giving it a unique place in the literature of the genus. After each species there are supplied details of its distinguishing features, its history, and geographical distribution; frequently also other information is given which has been drawn from volumes not readily accessible to the layman. The nomenclature has been revised and carefully worked out according to the International Rules. Important name-changes are, however, few. The bibliography provided at the end is of particular value, especially with regard to the early history of the genus, but fuller references to the literature in the body of the work would have rendered it even more useful from the botanical standpoint.

* By A. M. Ayre. Published privately by A. M. Ayre, St. John's, Newfoundland. Agents: L. Reeve & Co., Ltd., Ashford, Kent, 1935. Pp. 231, illustrations 231. Price

† "Lilies, Their Culture and Management." By H. Drysdale Woodcock, K.C. and J. Coultis (Curator, Royal Botanic Gardens, Kew). 8vo. xv + 242 pp., 130 illustrations. Country Life Limited, London. 1935. Price 15/- net.

Although, as its title indicates, the book does not purport to be a systematic treatise, it will form a very valuable reference work for the botanist as well as the horticulturist, and we congratulate the authors on the successful production of a volume which will be a stand-by to lily cultivators for many years to come. The work is well-produced, moderately priced, and illustrated by a large number of excellent photographs.

A Pocket Flower Book.*—This small volume should be of use to those wishing to obtain an introduction to the taxonomy of British seed plants. It is illustrated by 501 coloured figures, the majority by the late Miss Trower, and 28 (grasses) in black and white. Most of the reproductions are recognisable likenesses of the species they represent and many of the original paintings must be charming pictures. Several, such as that of the Grass-of-Parnassus (169), might well have been re-drawn. The colour (as reproduced) does not always give a happy impression. A blurred effect is probably unavoidable except at a cost which would have increased the price of the book very greatly. It is, however, unfortunate that the petals of the greater stitchwort appear as pale violet-purple and those of the meadow crane's bill as dark purple. The value of the figures to the beginners would have been increased had the degree of reduction been indicated.

The accompanying text seems adequate for its purpose. The descriptions are concise and many useful details are given concerning morphology, pollination, and habitats.

This book is confessedly not one for the expert. Many well-known British species are neither described nor mentioned. There is, therefore, a possible danger in its use by a beginner—that a specimen may be wrongly named by attaching to it the name which fits most nearly of those plants figured and described in the book. The reader is certainly warned on this point in the introductory chapter but the simple device of listing under each genus the species not dealt with more fully would have been a much better safeguard.

W. B. TURRILL.

Diseases of the Banana.†—The author states in his preface that this work is intended to provide useful information for the practical agriculturalist, the student, and the scientific investigator. Actually it is likely to appeal most to the last two of these cate-

* "A Flower Book for the Pocket," by Macgregor Skene. Illustrations by Charlotte Georgiana Trower and Ruth Weston. Oxford University Press, 1935, pp. 380. ill. 529. Price 7s. 6d. net.

† "Diseases of the Banana and of the Manila Hemp Plant," by C. W. Wardlaw. Macmillan and Co., Ltd., 1935. Pp. xii and 615, 292 text figures, 3 graphs. Price 30/- net.

gories. The book is an exhaustive compilation of existing knowledge as to the diseases of the banana and the Manila hemp plant, including troubles of transport and storage. After a short introduction describing methods of banana cultivation, the body of the work is divided into four sections, namely (1) Soil-borne, Vascular and Stem Diseases, (2) Plantation Diseases of Fruit and Leaf Diseases, (3) Virus Diseases and (4) Storage Diseases. Previous papers by the author and his colleagues are largely drawn upon, especially in the chapters dealing with Banana Wilt (Panama Disease), Bacterial Diseases of the Banana, and Transport and Storage problems. It is very useful to the investigator to have all these observations and experiments collected together, but the very detailed treatment is hardly such as will appeal to the average practical agriculturalist. In addition to first-hand information on the diseases investigated by the author, there are provided shorter accounts of all recorded diseases, whether due to fungi, viruses, or physiological causes. One disease, a *Dothiorella* rot of the fruit, is described for the first time, from information supplied by workers in Palestine. Occasionally the treatment is a little uncritical, as for instance in the account on pp. 160-161 of Elephantiasis or "Suriname Disease," where no indication is given to the reader that Essed's genus *Ustilaginoidella* is discredited by mycologists, and in fact was never properly described.

At the end of the book are four appendixes, the first of which is a useful list of fungi and bacteria which have been recorded in association with the banana, with references. The other three deal respectively with strains of *Fusarium cubense*, figures as to imports of bananas into Great Britain, and conditions on ship-board. A bibliography of 559 titles and an index complete the volume. The format is similar to that of other works on tropical agriculture issued by the same publishers.

Dr. Wardlaw's book represents an immense amount of labour, both original experimental work and critical scrutiny of literature, and will for long be a standard work of reference for those who have to deal with this tropical crop.

E. M. WAKEFIELD.

Field Studies in Ecology.*—This volume aims to provide, by a first-hand study of British vegetation, an introduction to the principles of ecology. It is based on the experiences of the author while conducting classes in plant ecology at Bristol University, and should prove of value to teachers wishing to organise similar courses elsewhere.

* By R. Bracher, M.Sc., Ph.D. J. W. Arrowsmith, Ltd., Bristol, 1934. Pp. 100. Figs. 10. Price 2s. 6d.

Transvaal Veld Flowers.*—The number of popular books on the botany of South Africa, and of the Transvaal in particular, is very small. Miss Verdoorn's little volume, therefore, should find a ready public.

A selection of the more conspicuous Transvaal plants is described under such headings as "November in the Middleveld," "When the grass is Long," and "A harbinger of Spring," and there is a number of illustrations by Miss Letty. Thirty-six of its eighty-two pages are devoted to an "Introduction to Botany," which might well have been omitted altogether in a work of this character, thus allowing space for the description of a greater number of species. The information given can be found in most elementary text-books.

We hope that the study of the native flora will be stimulated by the publication of this volume and that the author and artist will be encouraged to give us further work on the same lines.

Garden Flowers in Color.†—This volume consists of a collection of coloured illustrations taken from nurserymen's catalogues and similar publications, accompanied by a text giving a brief description of each plant, together with hints on cultivation.

The illustrations form the main feature of the book and cover a wide range of garden subjects. As might be expected from their source, they vary much in quality. The best, such as those of tulip varieties, are very striking examples of colour reproduction work. The text will be useful to beginners, though the style is often as highly coloured as the illustrations. The term "bulbous plant" is used in its widest sense, to include true bulbs, corms, tuberous roots and rhizomes.

Weeds.‡—Weeds have always been a bane of the gardener and agriculturalist. In recent years much effort has been directed towards the discovery of efficient methods of weed control, but records of the results are scattered through the literature. Professor Muenscher in his book aims "to make more available the information on the identification and control of weeds." The book has two parts, the first dealing with the dissemination, reproduction and control of weeds, with lists of the weeds of special habitats, while the second is a descriptive flora of 500 of the common weeds of the northern parts of the United States.

* "An Introduction to Botany and to a few Transvaal Veld Flowers," by I. C. Verdoorn. Speciality Press of S. Africa, Ltd., Wynberg, Cape, South Africa. Price 2/6 net.

† By G. A. Stevens, New York. The Macmillan Company, 1934. Pp. 320. Profusely illustrated in colour. Price 16s.

‡ By Walter Conrad Muenscher, assistant professor of Botany, New York State College of Agriculture at Cornell University, Ithaca, New York. The Macmillan Co., New York. 1935. Pp. xxii + 577. Price 25s.

A large proportion of the weeds listed for lawns, meadows and cornfields are common to this country, but few of our weeds are to be found in the cranberry bogs or rice fields. An analysis of origins of the weeds is of great interest. Only 39.2 per cent. are natives of the United States and of the remainder 35.4 per cent. are European and 13.2 Eurasian. No doubt the weeds of the Old World were introduced frequently with the seeds of crop plants. Some of the native American weeds occur sporadically in this country and as many of the remainder are now cosmopolitan, the sphere of usefulness of the book is not confined to the United States.

An artificial key occupying 36 pages simplifies the work of identifying a weed and though technical terms are used throughout, reference to the glossary should ease the difficulties of the layman. The descriptions of species are arranged alphabetically under families. In general they are adequate, but the descriptions of the species *Orobanche* might well be amplified. Suitable methods of eradication are indicated in each case by references to the chapters on mechanical and chemical methods of weed control, where the information given is usually sufficient for practical application. The value of the work is enhanced by 132 pages of accurate line drawings and a good bibliography.

R. MELVILLE.

A Flora of Assam.*—We welcome the first part of this long-awaited Flora. It is certainly time that the present knowledge of the botany of this Province should be brought together. The Flora is the work of three successive authors, all three being members of the Indian Forest Service, so that one more is added to the list of important botanical works executed by officers of that service. In the introduction acknowledgment is made to the many botanists and collectors who have contributed to our knowledge of the plants of the area, though no mention is made of Captain Kingdon Ward. In the introduction Mr. Das states, "Some herbaceous plants have been included, which are beyond the real scope of this work..." and, again, the last paragraph of the preface reads, "Monocotyledons will, it is presumed, be an entirely separate publication." In these circumstances, some qualifying epithet should have been added to the title of the work; as it stands, one is entitled to expect a complete account of at least all the flowering plants of Assam.

It is to be regretted that the nomenclature is not up-to-date. For example, the genus *Unona* L. (p. 33) is retained though Safford has shown that *Desmos* Lour. is correct for the oriental species; *Ternstroemiaceae* (p. 115) should be *Theaceae* and *Camellia theifera* Griff. (p. 122) *Thea sinensis* L.; *Bombax malabaricum* DC. is more correctly *Gossampinus malabarica* (DC.) Alston. The genus *Sterculia* in its broadest sense has been retained and not split, in conformity

with modern practice, into *Sterculia* L., *Erythropsis* Lindl., and *Pterygota* Endl. *Taraktogenos* has been sunk in the genus *Hydnocarpus* (p. 87) though there are quite adequate reasons for keeping the two distinct. It is not understood why some species have been treated differently and, though described, are not found in the specific key, nor numbered, e.g. *Sterculia khasiana* Debb. (p. 154).

It is not stated whether a key to the families is proposed; it would be a useful addition.

Apart from the above not very serious blemishes, this important work has been well executed and the authors, the last of whom is also its editor, are to be heartily congratulated. The introductory pages include an ecological sketch, the work of the late Mr. U. N. Kanjilal; a rather full account of the geology of the area; a note on climate; a synopsis of the families; and an ample glossary of botanical terms. The botanical part includes the families from the *Ranunculaceae* to the *Elaeocarpaceae*, following, with some exceptions, the "Genera Plantarum" of Bentham and Hooker.

The keys to the genera and species seem to be adequate and workable. The printing, binding and style is good, and the size quite handy for consultation in the field.

C. E. C. FISCHER.

Botanical Magazine.—Part 3 of volume 158 was published on July 29th, 1935, and contains the following figures: *Sorbus Esserteauiana* Koehne (t. 9403), a fine scarlet-berried species from Western Szechwan; *Dicranostigma Franchetianum* (Prain) Fedde (t. 9404), also from Szechwan and N.W. Yunnan; *Aquilegia grata* Maly ex Zimmeter (t. 9405), an interesting mauve-violet and white-flowered species from the Balkan Peninsula; *Vagaria parviflora* Herbert (t. 9406), formerly placed under *Pancratium*, with white flowers produced in the autumn, a native of Syria and N. Palestine; *Rhododendron campylogynum* Franch. (t. 9407A), from N.W. Yunnan and N.E. Upper Burma; *R. vaccinioides* Hook. f. (t. 9407B), another diminutive species found in the Sikkim Himalaya and in N. Burma; *Bulbophyllum elassonotum* Summerhayes (t. 9408), a new species, allied to *B. cupreum* Lindl., with orange flowers with reddish spots and an orange or brick-red labellum, a native of Assam; *Buddleja auriculata* Benth. (t. 9409), a pleasantly scented species with orange-throated white flowers, widespread in South Africa; *Primula amethystina* Franch., subsp. *brevifolia* Forrest (t. 9410), with bluish-mauve flowers, from W. China and S.E. Tibet; *Eucryphia Moorei* F. Muell. (t. 9411), from New South Wales and Eastern Victoria; *Rhodohypoxis Baurii* (Baker) Nel (t. 9412), a native of Natal and Eastern Cape Province, bearing either pink or white flowers, and *Enkianthus chinensis* Franchet (t. 9413), one of the most beautiful of the genus, found in E. Szechwan and extending to N.E. Upper Burma.

* By U. N. Kanjilal, P. C. Kanjilal and A. Das. Vol. I (Pt. 1). The Prabasi Press, Calcutta, 1935. Pp. lxxi + 184. Cloth, Price 8 Rs.

East African Agricultural Journal.—The East African Agricultural Journal of Kenya, Tanganyika, Uganda and Zanzibar makes its appearance with the issue of July, 1935, and hereafter will be published at intervals of two months. The annual subscription is 5s. post free, payable to the Government Printer, P.O. Box 128, Nairobi, Kenya Colony. The Journal is edited by Mr. W. Nowell, C.B.E., the Director of the East African Agricultural Research Station, Amani, and the Editorial Board consists of the Directors of Agriculture in Kenya, Tanganyika, Uganda and Zanzibar.

One of the greatest problems which faces any Director of Agriculture is how to bring to the notice of the farming community the results of the work which is being done by his Department. Administration reports are not the place for this. They are mainly intended to show Government how the expenditure incurred has been utilised and to give figures which will indicate how the work of the Department has added to the wealth of the country. Leaflets and bulletins are certainly of use but have only a limited circulation. A semi-official journal issued at regular intervals, therefore, if the subjects dealt with are written in a popular manner, should appeal to a wide public, not only over the whole of East Africa, but elsewhere in the world where similar climatic conditions prevail.

The first issue comprises eighty-nine pages. The articles contained in it are, with one or two exceptions, written by officers of the Agricultural Departments concerned, and one can feel that the authors have an intimate knowledge of their subject. Many of the articles deal with the important export and commercial crops of East Africa but others are of more general interest and include subjects such as soil erosion, overstocking, virus diseases, climate and weather.

If this Journal can maintain the high standard set by its first issue, it should have a wide and appreciative circulation, and if it leads to a better understanding of the activities of the Agricultural Departments of East Africa it will serve a most useful purpose. One would like to see articles written by private individuals, and it is hoped that these will come in time; but one realises that the settler in East Africa seldom has the time, even if he has the inclination, to put down on paper his experiences in any particular aspect of farming.

South African Timber Trees.*—This work represents part three of "Forest Trees and Timbers of the British Empire," the first parts of which have already been noticed (K.B. 1932, 256, and 1934, 140). In the present number, which has been continued along the same general lines as the first two, there are descriptions

* "Fifteen South African High Forest Timber Trees," by L. Chalk, M.A. D. Phil., M.M. Chattaway, B.Sc., M.A., J. Burtt Davy, M.A., Ph.D., F. S. Laughton, B.Sc., and M. H. Scott, B.Sc., Oxford, at the Clarendon Press, 1935.

of fifteen species which flourish in "the relatively moist strip of country along the south and east coasts (of S. Africa) lying between the sea and the upper slopes of the principal ranges of mountains running roughly parallel to those coasts." The species were selected by Mr. J. J. Kotzé, Chief of Forest Research at Pretoria, who also arranged for the necessary material to be supplied. Information concerning natural regeneration and silviculture was sent by Mr. F. S. Laughton of Knysna, while details concerning "sawing and seasoning" and "working qualities," contributed by Mr. M. H. Scott of Pretoria, are recorded more fully than in previous parts. Various changes have been made in the mode of presentation of the anatomical descriptions. Of these the most important is that details concerning the dimensions of the vessel elements have been omitted under the individual species, and have been expressed instead in a new and ingenious tabular form in an appendix. Alterations in the technique of making and recording measurements have also been made along lines which recent research has shown to be desirable. While these new methods probably yield more satisfactory data than were obtained previously, it is to be hoped that as few changes as possible will be made in the preparation of future parts, as inconsistency of treatment will make it difficult to use the whole work to the best advantage when it has been completed. This applies also to the use of descriptive terms, some of which have likewise been slightly changed, e.g. the constituent cells of a vessel were termed "vessel segments" in part 1, "vessel elements" in part 2, and "vessel members" in part 3. These changes have doubtless been made in order to make use of the "Glossary of Terms used in describing woods" recently drawn up by a special committee of the "International Association of Wood Anatomists," and it is to be hoped that further alterations will not be necessary. The high standard of the work as a whole has been well maintained, and the present number is especially useful owing to the difficulty in obtaining accurately-named specimens of the wood of the species described.

C. R. METCALFE.

The Woody Plants of Natal and Zululand.*—In the Kew Bulletin for 1932, 158, the excellent work of Dr. J. S. Henkel on types of vegetation in Southern Rhodesia was commented upon, and we are now pleased to note another very useful contribution to botany by the same author. Having retired from the Rhodesian forest service, he has turned his attention to the ligneous vegetation of Natal, and has produced a most useful book in key-form based on field experience during the last twenty years.

* By J. S. Henkel, D.Sc., F.R.S.S.Afr. Published for the Natal University Development Fund Committee, Durban and Pietermaritzburg, by Robinson & Co., Ltd., Mercury Lane, Durban. 252pp. (1934).

Dr. Henkel's key is constructed almost entirely from vegetative characters, in order that most of the trees and shrubs of Natal may be determined in the absence of flowers, and, so far as we have been able to test it, the key has worked extremely well. On leaf and stipule characters alone the species are ingeniously arranged into 29 artificial groups, and each group is trichotomously divided in nearly every case into *trees*, *shrubs* and *climbers*. Confirmation of a determination may be further checked by the provision of short general descriptions, in which, though excellent in other respects, there is rarely any mention of flowers or inflorescence or their position on the plant. This is much to be regretted, and is the only criticism we need make of a most original and useful book which may lead the beginner on to deeper studies of the rich and varied flora of Natal.

J. HUTCHINSON.

Coleus barbatus Benth.* ADDENDA ET CORRIGENDA.—Since the paper on *Coleus barbatus* Benth. was published, additional facts have come to light, requiring certain modifications.

(1) It appears that the combination "*Ocimum α Zatarhendi*" published in Forssk. Fl. Aegypt.-Arab. 109 (1775) was intended by Forsskaal as a new binary name for the species which he had previously listed on p. CXV *without description*, as "*Ocimum aegyptiac.*"

The letter "α" indicates that the plant described was typical *Ocimum Zatarhendi*. The next number described, namely "34 *Ocimum β Zatarhendi?*", was regarded by him as possibly being a variety of *O. Zatarhendi*, although he had previously listed it without description (see p. CXV) as a distinct species under the name *Ocimum villosum*. Forsskaal appears to have placed the varietal letters α, β, etc. in front of the specific epithet in cases where he did not supply varietal epithets, thus on p. 9 he has no. 24 *Dianthera α americana* and no. 25 *Dianthera β americana*, the latter followed by the remark, "Prioris an varietas, vel species diversa?"

It follows that the valid name under International Rules is *Plectranthus Zatarhendi* (Forssk.) E. A. Bruce, comb. nov., since the name *Ocimum aegyptiacum* was not validly published: it was unaccompanied by a description, and was rejected by Forsskaal when he supplied one. It accordingly has the status of a name published in synonymy.

The synonymy of the species concerned is as follows:—

Plectranthus Zatarhendi (Forssk.) E. A. Bruce, comb. nov.
Ocimum Zatarhendi var. α Forssk. Fl. Aegypt.-Arab. 109 (1775).
Ocimum aegyptiacum Forssk. l.c. p. CXV, sine descr.
Plectranthus Forskalaei Vahl Symb. 1, 44 (1790) excl. syn.
Coleus Zatarhendi (Forssk.) Benth. Lab. Gen. et Sp. 50 (1832).
Plectranthus aegyptiacus C. Chr. in Dansk Bot. Arkiv, 4, no. 3, 21 ‡ (1922).

*Continued from Kew Bulletin, 1935, 324.

(2) The combination *Plectranthus villosus* (Forssk.) was erroneously attributed in Kew Bull. 1935, 324, to Carl Christensen, who actually listed the species concerned under the name *Ocimum villosum* Forssk., while suggesting that it might perhaps be the same as *Coleus aromaticus* (Roxb.) Benth. or at least very nearly related to it (Dansk Bot. Arkiv, 4, no. 3, 21: 1922).

The synonymy of the species is accordingly as follows:—

Plectranthus arabicus E. A. Bruce in Kew Bull. 1935, 324.
Ocimum villosum Forssk. Fl. Aegypt.-Arab. p. CXV (1775), sine descr.
Ocimum Zatarhendi? var. β Forssk. l.c. 110.
Plectranthus villosus (Forssk.) E. A. Bruce l.c.

Christensen (l.c.) remarks that "the name *Zatarhendi* is not as several authors remark a specific but a generic one." Actually Forsskaal suggested (p. CXV) that *Ocimum aegyptiacum*, *O. villosum* and *O. vaalae* might be regarded as constituting a new genus under the name *Zatarhendi*, but when he came to describe these three species (pp. 109-111) he retained them in *Ocimum* and adopted the name *Zatarhendi* as a specific epithet for the species which he had previously called *O. aegyptiacum* (see above.)

E. A. BRUCE.

The Phylogeny of Zea Mays.* During the past twenty years Professor Weatherwax has published a series of papers giving the results of his researches on various aspects connected with the study of maize or Indian corn (*Zea Mays*). Although much has been written on the phylogeny of this very important cereal, his present comprehensive and critical account is justified by the accumulation of new information both regarding maize and its ally, teosinte (*Euchlaena mexicana*). The following is a summary of his conclusions on this much-discussed problem.

It is pointed out that our first trustworthy accounts of maize by the Spanish explorers of Mexico and Peru and by the earliest English colonists in North America indicate that it was then, as now, the same highly specialized plant and completely dependent upon man for its existence. The author takes into consideration all possible sources of evidence which might conceivably throw light on its ancestry, such as Indian myth and legend, work of archæologists and explorers, palæontology, and the botanical characteristics of maize; but he particularly emphasizes the value of evidence derived from a study of the plant and its near relatives.

The evidence from historical sources as to its origin is very meagre. It is probable that Indian races had stories concerning the commencement of maize agriculture, which in handing on from one generation to another would undergo modification, so that if in the beginning they had any foundation, such had disappeared before the coming of the white man. The earliest Indian manuscripts of the sixteenth century dealing with maize culture prove

* By Paul Weatherwax. The American Midland Naturalist, 16, 1-71 (Jan. 1935).

to be only an account of its introduction in its modern form from a nearby region. Increased interest in recent years in archæological exploration, however, may assist in some way in solving the problem.

The geological record as far as maize is concerned is almost a blank. Mention is made of Darwin's discovery of fossilized remains on an island off the coast of Peru and an explanation is put forward why these may not be of extreme age. The supposed fossil from Peru described by Knowlton has been shown to be an artifact made of clay and partially baked, whilst another supposed fossil found in Georgia turns out to be a cluster of hexagonal crystals arranged around an elongated axis.

There have been recurring reports of the discovery of wild maize. In parts of Mexico, teosinte, or natural hybrids of maize and teosinte have been sometimes stated to be the source of maize. The most recent report of wild maize is from Guatemala, where there is said to be a wild plant the small ears of which have the flavour of maize and are used as food. Without further corroboration Weatherwax does not feel justified in assuming this plant to be closely connected with maize; he considers, however, that the locality is one in which wild maize might well occur.

The tribe *Maydeae* to which maize belongs, may be geographically divided into two groups; one in the Eastern Hemisphere which the author considers can be safely disregarded in considering the ancestry of maize; the other confined to America, contains maize, teosinte and *Tripsacum*. Teosinte is no doubt the nearest known relative of maize, whereas *Tripsacum* does not seem to have a very close affinity with it. The resemblance between some members of the *Rottboellieae* and *Tripsacum* is indicated and a suggestion is made that a study of the American genera of this subtribe would be a basis for further phylogenetic studies.

Cytological research has shown that in maize the diploid chromosome number is typically 20, while in the annual and perennial species of *Euchlaena* the numbers are 20 and 40 respectively. In *Tripsacum* the diploid number is 72, except in one variety of *T. dactyloides* in which it is 36. These figures are not thought to provide much help as to the course of evolution in the American *Maydeae*. It is interesting to note, however, that Avdulov gives the basic (haploid) number as 9 in *Rottboellia* (*Rottboellieae*) which serves further to strengthen the suggestion of a relationship to *Tripsacum*. Evidence of close affinity amongst the American *Maydeae* is shown by the ability of the different members to intercross. Maize and annual teosinte hybridize readily and the offspring, being fertile, is strongly suggestive of a common origin. Maize and perennial teosinte have been intercrossed but the hybrids exhibit a much lower degree of fertility. Hybrids have also been produced between maize and *Tripsacum*, but none between the latter and any of the *Rottboellieae*.

The vegetative morphology and the construction of the inflorescence and spikelets of all the above genera are discussed and compared with those of maize. It is suggested that the 2-flowered condition of the male spikelets of the *Maydeae* and of the female spikelets of some varieties of maize represent a permanent reversion to an earlier condition rather than the retention of a primitive character; and further that the branch of the *Andropogoneae* from which the above genera have been derived, separated into two parts, one leading towards monoecism and forming the *Maydeae* and the other producing the *Rottboellieae*.

Certain significant features associated with various types of ears of maize are described. The typical ear has the grain arranged in 8 or more parallel longitudinal rows, the rows being grouped in pairs because the spikelets are in pairs. By extreme starvation it has been possible to reduce an ear almost to vanishing point, but even in such cases both female spikelets of a pair remain. This persistent retention of both spikelets in the female inflorescence distinguishes maize from the remainder of the American *Maydeae*. In some varieties the grains do not appear in rows. This apparent irregularity is due to the lower flower of each spikelet occasionally producing a grain and so breaking up the linear arrangement. Another type of irregularity is seen where the spikelets are grouped in triads, another character found in no other member of the American *Maydeae*. It is suggested that the ear has evolved from an inflorescence built up on the distichous plan. The author does not think it could have been derived from a loose panicle by the shortening of the branches until each was reduced to a pair of spikelets, as, although this might satisfactorily explain the origin of the pairs of spikelets, it gives no clue as to why they should be arranged in many, instead of two rows. The most widely accepted theory of the origin of the ear is by the fusion side by side of a number of 2-rowed spikes or racemes. This is shown to be plausible, as in the ear each two rows are often separated by an apparent line of fusion, whilst if the cob is subjected to pressure, it often splits along these lines. This theory, however, is not acceptable to the author who points out that spikes, like those of *Tripsacum* and *Euchlaena*, could not fuse to form an ear of maize unless the aborted spikelets became functional. In addition he has been unable to detect in the internal structure any evidence of fusion. It is shown that not only are the rows of spikelets arranged in a linear manner, but that there is also a lateral relationship between the spikelets, and by plotting the positions of pairs of spikelets they fall into a system of spirals; this is further evidence against the fusion theory.

The resemblance between maize and teosinte, their genetic compatibility, and apparent overlapping distribution, indicate that they have shared a common heritage. It has frequently been suggested that teosinte is the wild form of maize but Weatherwax's objection to this is that both plants are highly specialized, each in

some way more than the other. Teosinte differs from maize in possessing a hardened articulate rhachis and in the outer glume covering the grain. The author considers that the ancestor of maize separated much earlier from the same stock as the *Andropogoneae* and pursued its own course of evolution in complete isolation from teosinte. The theory of hybrid origin of maize through the crossing of some unknown grass with teosinte has been the subject of much discussion, but this is likewise not favoured by Weatherwax. Having reviewed and found unacceptable all other means of origin, the author gives a description of a hypothetical wild maize from which the cultivated plant might be derived. It was probably perennial by means of basal offshoots or rhizomes, had tall branched stems and great diversity in the degree and manner of development of the inflorescences. Those terminating the main stems had a strong tendency to be wholly staminate whilst those placed lower down on the plant and terminating short branches tended to be pistillate. It is suggested that this wild plant had large grains which were more or less produced beyond the bracts. The possible extinction of such a plant would be due to its being poorly fitted to living under natural conditions and its preservation in its present state to its adoption by man at a critical stage in its life's history. The author, however, thinks it not unlikely that in some isolated well-protected locality in Tropical America the wild plant may still be growing.

C. E. HUBBARD.

EDGAR THURSTON.—Mr. E. Thurston, C.I.E., died suddenly at Penzance on the fifth of October at the age of 80. He was the second son of Charles Bosworth Thurston of Kew. After leaving Eton he qualified as L.R.C.P. from King's College, London, and in 1885 was appointed Superintendent of the Government Museum, Madras, and held the position for a long period. During his stay in India he devoted much time to anthropological and ethnographic studies. The results of these were published in his works "Ethnographical Notes in Southern India" and "Castes and Tribes of Southern India," the latter in seven volumes. A later volume bore the title "Omens and Superstitions of Southern India." He received the Kaiser-i-Hind gold medal in 1902 and was made a C.I.E. in 1909.

After his retirement, Thurston lived chiefly in Cornwall, especially in Penzance, and devoted most of his time to a study of the flora of the county. In 1922 he published a Supplement to F. Hamilton-Davey's Flora of Cornwall (reprinted from the Journal of the Royal Institution of Cornwall, vol. 21). This was followed by seven papers (1923-29), every one under the title "Note on the Cornish Flora," and all but the last in collaboration with D. C. C. Vigurs. In 1929 he was awarded the Henwood Gold Medal for his researches on the British and alien plants of Cornwall. In 1930 he

published "British and Foreign Trees and Shrubs in Cornwall." This interesting book forms a useful introduction to the gardens and to the woody flora (native and introduced) of the county. It is illustrated with 42 photographic plates, many of which excellently represent the habit of the species.

In March 1919, Thurston presented his Cornish Herbarium to the Royal Botanic Gardens, Kew. To this valuable collection he has added large numbers of new specimens from year to year, making it a most complete county herbarium. The specimens were mounted by himself on stiff paper sheets, the standard size of the Kew Herbarium. Most of them are well collected and carefully prepared. At his request the collection has been kept as a unit during his lifetime.

Not only has Kew lost by Edgar Thurston's death a valued friend and generous donor, but many members of the staff feel, as individuals, the loss of his jovial personality and his ever youthful outlook on life.

W. B. TURRILL.

FERGUSON ESCOMBE.—We record with regret the sudden death of Mr. F. Escombe on October 12th. When the late Dr. Horace Brown, F.R.S. (see K.B. 1925, 96) was carrying out his important physiological researches in the Jodrell Laboratory during the years 1897-1901, Mr. Escombe was working with him and a series of papers was published in the "Philosophical Transactions of the Royal Society" under their joint names. These papers dealt with the influence of very low temperatures on the germinative power of seeds; the depletion of the endosperm of *Hordeum vulgare* during germination; the influence of varying amounts of carbon-dioxide on photosynthesis; and some physical laws of diffusion of gases and liquids in relation to the assimilation of carbon and translocation in plants. (See K. B. 1898, 62; 1901, 203, 204; 1902, 24; 1905, 71.) Mr. Escombe also carried out some research work in the Laboratory in 1910.

Flora of Niagara.—The area covered by the volume under review* is the region within a radius of about 50 miles from the city of Buffalo, N.Y., thus including the north-western part of New York State, and a portion of the adjacent Province of Ontario, Canada, lying between Lakes Erie and Ontario. "The consolidated rocks of the region are all of sedimentary origin, having been deposited in the Paleozoic seas that encroached upon the

* Flora of the Niagara Frontier Region; Ferns and Flowering Plants of Buffalo, N.Y., and Vicinity. By Charles A. Zenkert, Research Associate in Botany, Buffalo Museum of Science.—Bulletin of the Buffalo Society of Natural Science, vol. XVI. Buffalo, N.Y., August, 1934. 8vo. x + 328 pp., 69 illustrations, 1 map. Price 2 dollars.

interior of the continent in Silurian, Devonian and Carboniferous times." The whole of the area was subjected to glaciation during the great Ice Age, and the origin of the Great Lakes is attributed to the damming of the glacial and other waters by the moraines left behind by the retreating ice front. Lakes Erie and Ontario are the dwindled successors of a series of much larger glacial lakes, and the southern beach of glacial Lake Iroquois, the ancient predecessor of Lake Ontario, has served as a ready-made road-bed for the Ridge Road that runs eastward from Lewiston to Rochester.

From Lake Ontario, 246 feet above sea-level, a gently sloping plain extends southwards for seven miles to the base of the Niagara escarpment, a limestone formation that rises rather abruptly to a height of 200 feet above the Ontario plain. Proceeding southward, this is succeeded by the Huron plain (about 600 feet) and the Onondaga escarpment, a second but lower limestone cliff. Beyond this stretches the Erie plain (600-900 feet), bounded on the south by the Portage escarpment, which forms the northern fringe of the great Alleghany plateau, the north-western part of which lies within the area of the Niagara region flora.

"The physiographic setting of the region is such as to exhibit an appreciable range of climatic values and a rather marked reversal in the zonal distribution of vegetation—northern plants thriving in the southern uplands and southern forms being at home in the northern lowlands." It has long been known that the region of the Great Lakes enjoys a mild, almost oceanic, climate, and the northern part of the Niagara area accordingly contains a large Austral element, including such characteristic trees and shrubs as *Celtis occidentalis*, *Morus rubra*, *Magnolia acuminata*, *Liriodendron tulipifera*, *Asimina triloba*, *Sassafras officinale*, *Ptelea trifoliata*, *Ceanothus americanus*, *Aralia spinosa* and *Nyssa sylvatica*. Among herbaceous plants of Austral type are *Lilium philadelphicum*, *Erythronium albidum*, *Disporum lanuginosum*, *Comandra umbellata*, *Cimicifuga racemosa*, *Actaea alba*, *Hydrastis canadensis*, *Anemonella thalictroides*, *Chimaphila maculata*, *Asclepias tuberosa*, *A. phyto-laccoides*, *Polemonium reptans*, *Mertensia virginica*, *Lithospermum Gmelini* and *Onosmodium hispidissimum*.

On the other hand many boreal types, including various glacial relicts, are found in the southern part of the region, in the glaciated area of the Alleghanian plateau north of Salamanca: among them are *Myrica Gale*, *Ledum groenlandicum*, *Kalmia polifolia*, *Chamaedaphne calyculata*, *Andromeda glaucophylla*, *Vaccinium Oxycoccos* and *Rhynchospora alba*.

Evidence for a westward migration of the Atlantic coastal plain flora along the shores of the glacial lakes and their outlets during the last of the Algonquin stage is provided by a list of 15 coastal

plain species recorded from the Niagara region: this includes *Woodwardia virginica*, *Peltandra virginica*, *Listera australis*, *Myrica carolinensis* and *Cakile edentula* var. *lacustris*.

It is difficult to secure reliable information as to the original extent of the deciduous forests in the north-eastern United States, since "there is no one of the vegetational areas of the United States that has been more completely and profoundly altered by man than has this." The appearance of the Niagara region in 1721 was described by Charlevoix in the following words: "Behind those uncultivated and uninhabitable mountains [Niagara escarpment] you enjoy the sight of a rich country, magnificent forests, beautiful and fruitful hills; you breathe the purest air, under the mildest and most temperate climate imaginable, situated between two lakes, the least of which is two hundred and fifty leagues in circuit." As late as 1795 much of the ground that later became the city of Buffalo was "an unbroken wilderness"; the forests in the Erie plain were even then, however, by no means continuous, being broken by large open spaces which seem to have owed their origin, at least in part, to the burning of the drier parts of the forests by the Indians so as to produce fresh and sweet pasturage for the purpose of alluring deer. Owing to clearing of the ground for agriculture, the requirements of the lumber industry, and the demand for firewood and charcoal before coal came into general use, the forests covering in western New York was reduced to one-fourth during the fifty years 1845-1895.

The disappearance of forests has been followed by the usual consequences of shrinkage of watercourses in summer, increased mechanical erosion of the soil, and more important still, its rapid impoverishment by the greatly accelerated removal of mineral salts. "In less than a century agriculture in the Niagara region progressed from the stage of man's conquest of the wilderness to that of a struggle for weed control": out of a total flora (Phanerogams and Pteridophytes) of 1587 species, no fewer than 400 are aliens.

The preceding paragraphs touch on only a few of the points dealt with in Mr. Zenkert's "Flora," the general part of which forms attractive and stimulating reading. Eighteen pages (pp. 5-22) are devoted to the history of the botanical exploration of the area, with which the names of Peter Kalm (1750), François André Michaux (1806), David Douglas (1823) George W. Clinton (during the period 1826-1882) and David F. Day are associated. The account of the Regional Environmental Conditions (pp. 23-67) includes sections on the Topography and Geology, Climatic Factors and Data, Zonal Relations of the Niagara Flora, and Human Agencies and Man-wrought Changes. Then follows the Systematic Account of the Species (pp. 68-274), the general interest of which would have been increased by a brief indication of the geographical distribution of each species. The final section (pp. 275-312), entitled Ecological Areas and Plant Societies, consists of short

sketches of the vegetation of selected areas with lists of prevalent species. The map, pasted inside the back cover, is commendably clear. Mr. Zenkert and the Buffalo Society of Natural Sciences are to be congratulated on the satisfactory completion of their regional "flora," which embodies the results of local botanical research extending over a period of more than fifty years.

T. A. SPRAGUE.

Interpretation of Loureiro's Plants.*—All systematic botanists have experienced from time to time the difficulties of interpreting many of the long-standing species, when authentic specimens are lacking and descriptions are inadequate. Any efforts to throw light on these obscurities and to solve the problems presented are, therefore, most welcome. Dr. E. D. Merrill has earned the gratitude of systematic botanists by the publication of the work now under consideration, which shows evidence of deep knowledge and of long and painstaking research. One is not astonished to learn that the author completed a preliminary study of Loureiro's species so long ago as 1919, and has been engaged on their study ever since. Copies of this preliminary study were sent to various botanical institutions to stimulate further research and the present volume is the outcome of the work of others as well as of Dr. Merrill himself. The competence of the author of "*Species Blancoanae*" to undertake this research is obvious and the work has been executed in the manner one associates with his name. He has done justice to the labours of other workers in this field and has quoted sixty books and papers in the bibliography.

The difficulty of such research in interpretation is well-known to all who have had to make use of such works as Loureiro's "*Flora Cochinchinensis*," where the complications are increased by the misinterpretations of the descriptions of earlier authors, especially of Linnaeus.

Of the 1292 species described by Loureiro, 135 have been reduced as duplicating others published in the same work, so that 1157 had to be accounted for. Not all the problems have been solved; very few, however, are now outstanding, and it is more than doubtful, unless some new discovery of Loureiro's own specimens is made (a very unlikely contingency), that any further elucidation is possible.

C. E. C. FISCHER.

* A Commentary on Loureiro's "*Flora Cochinchinensis*" by E. D. Merrill. *Transactions of the American Philosophical Society*. New series, vol. 24, part 2. June 1935. Published by the Society at Philadelphia. Pp. 445. Price 5 dollars.

BULLETIN OF MISCELLANEOUS INFORMATION Appendix 1935 ROYAL BOTANIC GARDENS, KEW

REVIEW OF THE WORK OF THE ROYAL BOTANIC GARDENS, KEW, DURING 1935.

General

STAFF.—During the period of activity of the Empire Marketing Board additional Herbarium staff was appointed, with the aid of a grant from the Board, primarily in order to deal with the increased volume of collections from the Dominions and Colonies which other grants from the Board for overseas collections had stimulated. The following members of the staff, formerly employed under the auspices of the Board, have now been appointed to the permanent staff: Mr. C. E. HUBBARD and Mr. E. W. B. H. MILNE-REDHEAD (Botanists), Mr. H. K. AIRY-SHAW and Miss C. I. DICKINSON (Assistant Botanists), and four Preparers.

Permanent posts with the title of Sub-Assistant have been created to take the place of part of the former grant for Temporary Technical Assistance.

The title of Sub-foreman has been altered to that of Foreman.

Mr. W. DALLIMORE, V.M.H., Keeper of the Museums, received the Honour of the I.S.O. in the King's Birthday and Jubilee Honours.

By command of H.M. The King, the DIRECTOR, Mr. A. D. COTTON, O.B.E., and Mr. J. T. HAZEL, were honoured with the award of the Silver Jubilee Medal.

Sir DAVID PRAIN, Director of the Gardens from 1905 to 1922, received the Honour of the Linnean Gold Medal at the Anniversary meeting of the Linnean Society.

THE DIRECTOR was elected a Corresponding Member of the Netherlands Botanical Society at the meeting of the Sixth International Botanical Congress at Amsterdam, and has also been made an Honorary Member of the Orchid Circle of Ceylon.

OFFICIAL VISITS.—THE DIRECTOR and THE KEEPER OF THE HERBARIUM represented the Royal Botanic Gardens, Kew, at the Tercentenary Celebration of the Muséum National d'Histoire Naturelle at Paris from June 24th to 29th. An illuminated address from the Royal Botanic Gardens was presented by the Director; he was also entrusted with the honour of delivering a discourse at the Séance Solennelle in the name of all the Foreign Delegates.

THE SIXTH INTERNATIONAL BOTANICAL CONGRESS, 1935.—THE DIRECTOR and eight members of the Herbarium staff, including the Botanist for South Africa, attended this Congress at Amsterdam in September. The Director was Head of the British Government Delegation, and the Keeper and Deputy Keeper of the Herbarium represented the Ministry of Agriculture and Fisheries. The Director was invited to deliver an address of thanks on behalf of all the foreign delegates. The following members of the staff read papers: Mr. Cotton, Miss Wakefield, Dr. Turrill, and Dr. Hutchinson.

As Rapporteur Général, Dr. Sprague prepared the "Synopsis of Proposals concerning Nomenclature" and "Preliminary Opinions concerning Nomenclature Proposals" submitted to the Congress and took a prominent part in the discussions on nomenclature. Miss M. L. Green, as Secretary for English, was responsible for the detailed English report of the nomenclature proceedings. All the members of the Kew staff attending the Congress had important duties as members of various committees.

PLANT AND SEED INTRODUCTION.—In the Annual Review for 1933, the publication of a list of the crop plants cultivated throughout the Empire was foreshadowed. The work of compilation has been completed during the year and the results have been published under the title "Cultivated Crop Plants of the British Empire and the Anglo-Egyptian Sudan (Tropical & Sub-Tropical)," by H. C. Sampson, Economic Botanist, Royal Botanic Gardens, Kew.*

THE THIRD IMPERIAL BOTANICAL CONFERENCE, 1935, was held in the rooms of the Linnean Society, Burlington House, from August 28th to 30th. THE DIRECTOR was President of the Conference and several members of the staff attended. On August 30th, the delegates visited Kew and were entertained to luncheon by His Majesty's Government, and subsequently were conducted by the Director and members of the staff through the Gardens, Museums and Herbarium. A Report of the Proceedings (price 1/-) has been published and may be obtained from the Director, Royal Botanic Gardens, Kew.

PUBLICATIONS.—Ten numbers of the Kew Bulletin were published during the year, and the Review of the work during the year 1934 was issued as an Appendix. Four numbers (6-9) were published under one cover and were devoted to nomenclature papers in connexion with the Sixth International Botanical Congress at Amsterdam. The List of Seeds was published as a separate pamphlet.

New editions of the Popular Official Guide and Illustrated Guide were published during the year, the latter having the innovation of a coloured photograph on the cover.

Part 10 of the "Flora of the Presidency of Madras" was published in February.

* Kew Bulletin: Additional Series XII. H.M. Stationery Office. Price 6s. 6d.

The Gardens

VISITORS.—The number of visitors to the Gardens in 1935 was 1,091,220—weekdays (except students' days) 574,628; students' days 58,022; Sundays 458,570—a decrease of 79,149 as compared with the figures for 1934, due largely to the destructive frost in the middle of May, when the beauty of so many flowering trees and shrubs was destroyed, and to the wet weather in June and in the early autumn. The greatest monthly attendance was in May with 195,298, and the lowest in December with 10,121. The highest daily attendance was 55,149 on Easter Monday, 22nd April; the lowest was 10 on December 24th.

GENERAL.—During the past year frost, drought and gales caused considerable damage in the Gardens. The severe frost during the night and morning of May 16th and 17th seriously injured the young growths of trees and shrubs, whilst in many cases the floral display was completely ruined for the season (a full account of the effect of this frost will appear in *K.B.* 1936, no. 1). Fortunately, however, the great majority of plants do not appear to have suffered permanent injury. As a climax to a far from satisfactory season came the gale of September 6th, which caused widespread damage. Although only a few trees were uprooted, seldom has there been such general damage to all classes of trees in the way of broken limbs and branches. The principal injury to trees occurred on and around the Seven Sisters Lawn, where two large Lombardy poplars were blown down, damaging other trees in their fall, and *Populus generosa*, *P. marylandica* and *Quercus sessiliflora* var. *mespilifolia* suffered severe damage, the tree of *P. generosa* being reduced to the main trunk.

On the whole the summer was characterised by showery weather relieved by one short, hot spell. Heavy rains fell during the autumn and early winter. The water consumption for the year amounted to 25,638,000 gallons as compared with 31,731,000 gallons in 1934.

DECORATIVE DEPARTMENT.—In the Rose Garden the six beds on the upper level have been cleared of shrubs and planted with roses, thus completing the Rose Garden scheme. House 4 was reconditioned where necessary and repainted inside and out with the exception of the exterior of the wings. In the Melon Yard the exterior and interior of Houses 23, 23A and 18E were painted, likewise the exterior of Pits 18C and 18H.

HERBACEOUS DEPARTMENT.—The sides of the bank at the south end of the Herbaceous Ground on either side of the central pathway has been sloped off, giving a shallow, valley-like effect and improving the view of the Temple of Aeolus and the Mound from the Herbaceous Ground. The dressed granite steps in the Rock Garden, which were

out of keeping with the general surroundings, have been replaced by steps of rough, undressed sandstone. At the same time, the path leading down from the Orchid House side of the Rock Garden has been reconstructed in order to screen the houses from the Rock Garden. Among the more interesting plants which flowered in this department during the past year were *Cypripedium guttatum*, *C. candidum*, *Fritillaria biflora*, *F. pluriflora*, *Iris innominata*, *Linaria ventricosa*, *Orobanche uniflora* and *Primula Sherriffae*.

THE WATER GARDEN.—This has been greatly improved during the past two years. The cement covering the brickwork of the raised tanks was removed last year and the tanks were re-faced with pleasantly coloured old bricks. The wall of the central tank was raised eighteen inches, making the pool a proper depth for the water-lilies. The effect on the growth and flowering of the lilies this year has been very marked. Early in the year the pathway round the central pool was paved with flagstones, greatly improving the aesthetic effect of the whole water garden.

ARBORETUM.—The stables have been remodelled, the old stalls being converted into separate loose boxes entered from the yard; the chimney stack of the old pumping station in the Stable Yard has been demolished.

In the Bamboo Garden the west and south sides have been extended by the formation of deeper bays which have increased the planting area and given the garden a more spacious appearance. The north-east side will be treated later in the same way.

The familiar old horse chestnut tree, surrounded by a fence by the river side near the south end of the Rhododendron Dell, with its rooted branches growing into independent trees, has had to be cut down, owing to bad infection with disease which had caused it to become very unsightly and dangerous. It will be greatly missed, but fortunately, thanks to Archdeacon Lonsdale Ragg, we have two drawings of the old tree made by him last year, which are now hanging in Museum 4. The oak collection will now be extended over the ground covered by the chestnut. The horse chestnuts which formed a group on the south-west side of the Broad Walk have been in declining health for a number of years, and were so severely damaged by the gale of September 16th that four of them had to be felled. In their place a new rhododendron bed has been made to correspond with the one on the opposite side, thus completing the design of the Broad Walk throughout its length.

In the Arboretum Nursery the new Arboretum Pit has been extended, taking the place of the old line of sunk frames, and makes a very useful house for growing on young stock plants for the Temperate House.

TEMPERATE HOUSE.—A gravel path has been made in the centre of the grass avenue leading from the west doors of the

Temperate House to the Holly Walk. This connects with a new direct service path to the stable yard and arboretum nursery, with the object of preventing the formation of footpaths across the grass, and has proved satisfactory.

Pyrus campanulata flowered freely in the spring in the Temperate House and from one of the fruits a young seedling has been raised.

TROPICAL DEPARTMENT.—Palm House. The iron construction under the gratings has been renewed in the north-east end. In the central dome many panes of tinted glass have been removed and replaced with clear glass, while on the upper parts of the roof the black deposit, which has encrusted the glass for years, has been removed by scrubbing with pumice. These operations have resulted in a considerable addition of light to the house, a benefit which is especially of value during the winter.

T RANGE.—The hot-water pipes in the Nepenthes House have been rearranged and a new underground storage tank for rain-water has been constructed outside the Insectivorous House.

SHERMAN HOYT HOUSE.—A new entrance doorway has been constructed between this House and House 7 and a sliding door has been fitted in place of the swing door leading into the latter.

Thanks to the generosity of private donors a long, low teak house for South African Succulents has been constructed parallel to the Sherman Hoyt House with which it communicates at the western end. The building was finished at the end of last year and internally the benches are built up with Triassic (new red) sandstone quarried near Liverpool which closely resembles the Karoo sandstone. All the succulents will be planted out amongst sandstone, and the work will be completed early in the spring.

In the southern bay of House 2 the wall shave been covered with slabs of peat, fixed to the walls with non-corrosive metal rods. Ferns have been planted on them and spores have germinated naturally. The pillars supporting the roof have also been covered with peat on which ferns are now growing vigorously. These two improvements have considerably enhanced the effect of a tropical forest which it is intended to convey in this portion of the house. The interior and exterior of House 5 has been repaired and repainted. A collection of stapelias has been planted out on the stage on the west side of the house. They have made remarkably fine growth in the few months which have elapsed since they were planted out.

Among interesting plants the flowering of the Western Australian insectivorous plant *Byblis gigantea*, which was raised from seed, is deserving of record; also the fruiting of *Theobroma Cacao* var.

Forestero, and *Piper nigrum* in the Tropical Economic House. A number of plants of the interesting Australian filmy fern, *Loxsonia*, have been raised from spores brought over from New Zealand.

Owing to the damage caused by London fogs, electric fans have been temporarily installed in the Tropical Orchid Houses and the Begonia House, and have given satisfactory results; experiments in connexion with London fog damage are still in progress.

MELON YARD.—In Houses 18A, B and C, the hot water pipes have been renewed and overhead heating installed, the staging being reconstructed where necessary.

STUDENT GARDENERS.—Although the movements of students were not so numerous as in 1934 the position may be regarded as satisfactory.

Outgoing Students.—Fourteen men completed their training and secured appointments as follows:—Home.—Parks Departments—eight; Educational Authorities or Establishments—three; nurseries or private gardens—one. Overseas.—Sudan—one; New Zealand—one.

One student proceeded to La Mortola, and another to Spain (Cap Roig). Both men will return to Kew to complete their training in due course.

Ill health caused the resignation of one student.

New Entrants.—Seventeen men, all British subjects, were appointed to full course vacancies and were recruited as follows:—Parks Departments—five; nurseries or private gardens—nine; Armstrong College, Newcastle-upon-Tyne—one; Botanic Garden, Oxford—one, and Botanic Garden, Wellington, New Zealand—one.

In connexion with the exchange of students scheme, men were sent to and entered from Berlin Botanic Garden; Sans Souci Garden, Potsdam; Luxembourg Gardens, Paris, and the Ontario Agricultural College, Canada.

Volunteer students were admitted for varying periods as follows: Great Britain—two; Canada—one; Holland—two; U.S.A.—two; and Italy—one.

RAINFALL RECORD.

Rainfall recorded at the Royal Botanic Gardens, Kew, during 1935:

Inches.			Inches.		
January	...	.97	July	...	.98
February	...	2.18	August	...	1.93
March	...	.33	September	...	2.44
April	...	2.78	October	...	2.10
May	...	1.01	November	...	4.40
June	...	3.09	December	...	2.31
Total 24.52 inches.					

The total for 1934 was 18.25 inches.

WATERFOWL.—Lady Byng of Vimy presented four common pintails (one duck and three drakes) and a number of carolina and mandarin eggs; five of the former and three of the latter have hatched out. M. Jean Delacour gave one pair each of S. African shelldrake, Australian wild duck and Meller's duck. Three rosy-billed pochards (two ducks and one drake) and a pair of gadwall were presented by Sir Charles Langham.

The Stanley Crane "Joey," who had been a familiar figure in the Gardens for 20 years, came to an untimely end when attempting to cross the ice on the lake to one of the islands and, falling through, was frozen. The Director of the National Zoological Garden of South Africa, Pretoria, has kindly sent over a young male Stanley Crane to take his place.

CONTRIBUTIONS TO THE GARDENS, 1935.—During the year, 1097 separate consignments of living plants, bulbs, seeds, etc., were received, a slight increase as compared with the figure (1073) for 1934. The following is a summary of the items of most interest:—

Public Institutions:—

Alger, Botanic Garden.—38 packets of seeds.

Alma-Ata, Botanic Garden, U.S.S.R.—20 packets of seeds.

Amani, East African Agricultural Research Station.—Suckers of *Musa* spp.; plants of *Bignonia venusta* for re-despatch to Barbados.

Arnold Arboretum, U.S.A.—Seeds of *Zizania aquatica*, *Acer nikoense*, and *Fraxinus americana* var. *ascidiata*.

Berlin-Dahlem, Botanic Garden.—A collection of choice ferns, stove and greenhouse plants; also a large collection of seeds—various.

Bermuda, Department of Agriculture.—Bulbs of *Lilium longiflorum* var. *eximium*; also of Bermuda-grown Roman hyacinths.

Bombay, Municipal Gardens.—Plants of *Allamanda*, *Bougainvillea*, *Tacsonia*, *Achania* and *Selaginella* spp.; also rhizomes of *Hedychium* spp.

British Museum (Natural History).—Seeds, collected in Tibet and Bhutan by Mr. F. Ludlow and Captain G. Sheriff, in Tropical Africa by Mr. G. Taylor, and in Tierra del Fuego by Mr. P. W. Reynolds; bulbs, tubers and plants collected by Mr. Willoughby Lowe and Miss Waldron in the Gold Coast; bulbs collected by Miss N. Lindsay in Persia.

Calcutta, Royal Botanic Garden.—Fruits of *Balanites Roxburghii* and seeds of *Amherstia nobilis*.

Cambridge, Botanic Garden.—Plants, including a collection of ferns and stove plants, and spp. of *Kalanchoë*, *Scutellaria Lehmannii*, *Hoodia Barrii*; also various seeds.

Cambridge University Expedition to Nigeria.—Fruits of *Icacina* species.

- Canberra, Commonwealth Forestry Bureau.—Seed of *Hibiscus insularis* from Norfolk Island.
- Chelsea Physic Garden, London.—A collection of stove plants.
- Copenhagen, University Botanic Garden.—A large collection of seeds, spores and tubers; cuttings of *Selaginella bellula*, seedlings of *Orontium aquaticum* and corms of *Crocus Pallasii*.
- Cuba, Harvard University Botanical Garden, Cienfuegos.—Seeds including *Coffea zanguebariae*, *Psychotria undata*, and *Malpighia puniceifolia*.
- Darjeeling, Lloyd Botanic Gardens.—A large collection of seeds of Eastern Himalayan plants.
- Edinburgh, Royal Botanic Garden.—Plants, including *Gentiana* spp., *Eriocaulon* spp., *Primula brevifolia*, *P. Sherriffae*, *Heliamphora nutans*, and *Pinguicula lusitanica*.
- Fiji, Department of Agriculture, Suva.—Suckers of *Musa* spp.
- Florida, Coconut Grove, U.S. Plant Introduction Garden.—Seed of *Coccothrinax Garberi*.
- Glasgow, Botanic Garden.—Plants of *Calceolaria*, *Huernia*, *Ouvirandra*, *Todea* and *Hymenophyllum* spp.
- Glasvein, Botanic Garden.—Seeds and cuttings.
- Gold Coast, Department of Agriculture, Accra.—Bulbs and seeds.
- Gröningen, Botanic Garden.—Plants of *Lycopodium Hippiuris*, *Drynaria quercifolia*, *Polypodium punctatum* var. *reino-cristata* and seeds—various.
- Hobart, Botanical Garden.—A Wardian case of plants. Unfortunately several died during the voyage.
- Hobart, Forestry Department.—A Wardian case of plants, all of which, however, were dead on arrival.
- Hong Kong, Botanical and Forestry Department.—Several interesting consignments of seeds of trees and shrubs and fern spores.
- Hyde Park, London.—Plants, including spp. of *Meconopsis*, *Nierembergia*, *Verbena*, *Campanula Bolusii*, *Semeiandra grandiflora*, *Coleus Forskohlii*; also a large number of bulbs of *Lilium Wallichianum*.
- John Innes Horticultural Institution, Merton.—Plants, including *Conophytum*, *Argyrodema* and *Calceolaria* spp., bulbs of *Lachenalia* spp.
- Innsbruck, Botanic Garden.—Plants of *Pinus sylvestris* and *Salix purpurea* bearing *Viscum album*.
- Khartoum, Government Gardens.—A Wardian case of plants.
- Kimberley, McGregor Memorial Museum.—Plants, bulbs and seeds.
- Kirstenbosch, National Botanic Gardens.—Seeds, including a collection of *Erica* spp. and vars.; also *Jubaeopsis caffra* forwarded on behalf of Mr. H. C. Bellew, Pondoland.
- Lahore, Forest Office, Punjab.—Seeds of *Iris Milesii*, *Strobilanthes atropurpureus* and *Ulmus* spp.
- Leiden, Botanic Garden.—Plants of *Psilotum flaccidum*, *Costus mexicanus*, cuttings of *Nepentia plena* and seeds—various.
- Lisle, Morton Arboretum, U.S.A.—Cuttings of *Deutzia scabra* var. *Fortunei* and of four spp. of *Populus*; also seeds—various.
- Lourenço Marques, Agricultural Services, Portuguese East Africa.—Plants of *Euphorbia* spp.
- Lund, Botanic Garden.—Consignments of seeds.
- Lu-Shan, Arboretum and Botanic Garden, China.—Several large consignments of seeds including new or rare species of trees and shrubs.
- Lyon, Botanic Garden.—Seeds, including *Victoria regia* var. *Trickeri* and *Euryale ferox*.
- Maymyo, Botanical Garden.—A collection of orchids and bulbs.
- Montreal, University Botanical Institute.—Seeds of *Cirsium minganense*, a very rare and remarkable endemic species from the Gulf of St. Lawrence.
- New York, Botanic Garden.—A collection of palms and cacti; seeds of *Dendromecon rigida*.
- New Zealand, Department of Agriculture, Wellington.—A consignment of banana suckers from Apia, Samoa. All were dead on arrival; they appeared to have been chilled on the voyage.
- Ottawa, Central Experimental Farm.—Seeds.
- Oxford, Botanic Garden.—Plant of *Cadalvena spectabilis*.
- Paris, Museum national d'histoire naturelle.—Collection of plants comprising species and varieties of *Blechnum*, *Platyserium*, *Euphorbia*, *Phalaenopsis*, etc.
- Peradeniya, Royal Botanic Garden.—Two shipments of plants and several consignments of seeds.
- Pietermaritzburg, Natal University College.—Seeds of *Jubaeopsis caffra*, forwarded by Mr. J. W. King, Umtata.
- Pretoria, Division of Plant Industry.—Bulbs, seeds and fruits.
- Singapore, Botanic Gardens.—Seeds of *Sonerila johorensis* and *Livistona Robinsoniana*.
- St. Helena, Agricultural and Forestry Office.—Two cases of bulbs of *Lilium longiflorum* var. *eximium*.
- Stellenbosch, University Botanic Garden.—Plants, including *Limosella Merenskyana* discovered in 1934, and *Pachypodium namaquanum*.
- Trinidad, Imperial College of Tropical Agriculture.—Cacao pods.
- Trinidad, Royal Botanic Gardens.—A collection of ferns and cacti; cuttings of *Ananas sativus* var. *variegata*; seeds of *Anemopaegma carterensis*.
- Uganda, Department of Agriculture.—A Wardian case of plants; fruits of *Eugenia caryophyllata*.
- Washington, U.S. Department of Agriculture.—Roots of *Saururus cernuus*; plants of *Anemopsis californica* supplied by Dr. Carl Epling, Los Angeles.

Wisley, Royal Horticultural Society's Gardens.—Plants and cuttings, *i.e.*, alpine, tropical and temperate subjects, also a hybrid said to be *Pernettya mucronata* x *Gaultheria Shallon*.

Zanzibar, Department of Agriculture.—A Wardian case of Zanzibar clove seedlings.

Private Donors :—

Mrs. L. Amory, Tiverton.—A collection of species and varieties of *Pelargonium*.

Mrs. M. W. Bailey, Halesworth.—Plant of *Salix* species from Baffin Land.

Mr. E. K. Balls, Knebworth.—Consignments of plants, bulbs, corms and seeds from his 1935 expedition to Turkey. Mention must be made of some beautifully feathered forms of *Crocus cancellatus*.

Mr. T. T. Barnard, Wareham, Dorset.—Seedlings of *Cleanthe* and *Aristea* spp., also a large collection, made in South Africa, of seeds, corms and tubers.

Mr. J. C. Bennett, London.—Seeds of West N. American high alpine.

Mr. Charles Bock, Juan Fernandez.—Plants and spores of *Thyrsopteris elegans* and *Lomaria cycadifolia*, and plants of *Dicksonia Berteroana*. The addition of these most interesting plants, from Robinson Crusoe Island, to the Kew collection, is in no small measure due to the kind assistance of H.M. Consul General, Valparaiso, who supervised the arrival of the plants from the Island and cared for them pending despatch to England, the arrangements for which he also undertook.

Miss E. A. Britton, Tiverton.—Plants, bulbs and seeds.

Mr. J. R. Brown, Pasadena, California.—A collection of species and varieties of *Haworthia*, *Andromischus*, *Cheiridopsis*, etc.

Mr. E. G. Bryant, Prieska, South Africa.—Plants, bulbs and seeds.

Mr. P. J. Byrne, Cape Bedford, Cooktown, N. Queensland.—Seeds, including *Parinari Nonda*, *Pongamia glabra*, *Petalostigma quadriloculare*.

Mr. C. E. Carr, Port Moresby, Papua.—Seed of a species of (?) *Cassia* collected in the lower altitudes of the unknown interior behind the Gulf Division by Mr. J. G. Hides, the discoverer of Mount Jubilee.

Messrs. Charlesworth & Co., Ltd., Haywards Heath.—A collection of orchids.

Col. Stephenson R. Clarke, Haywards Heath.—Plants, including *Chirita Trailliana*, *Sarmienta repens* and *Lonicera arizonica*.

Mr. R. E. Coates, London.—74 packets of seeds collected in Persia.

Mrs. D. J. Collins, London.—Tubers and seeds from Siam.

Mrs. F. L. Corfield, London.—Corms of *Acidanthera bicolor* var. *Murielae* and plants of *Gladiolus* spp. from Abyssinia, collected by Mr. F. D. Corfield.

Dr. J. M. Cowan, Edinburgh.—Seeds from the Darjeeling district including *Schifflera elata* and *S. impressa*.

Mr. L. Denny, Strawberry Hill, Middlesex.—A large consignment of orchids and stove plants brought from India ; also plants and cuttings of *Crassula*, *Euphorbia* and *Cymbidium* species, etc., from his collection.

Professor K. Dinter, Bautzen, Germany.—A consignment of seeds collected in South West Africa.

Messrs. Duncan & Davies, Ltd., New Plymouth, New Zealand.—A large consignment of shrubs which, considering the length of the voyage, arrived in fair condition.

M. L. Dutrie, Meirelbeke, Belgium.—A collection of stove plants.

Mr. Clarence Elliott, Stevenage.—Plants of *Perezia* species.

Captain Esme Erskine, Gore, Western Abyssinia.—Several consignments, amongst which may be mentioned tubers of a forest *Begonia* and *Impatiens regia* ; seeds of *Milletia ferruginea*, *Stictocardia beraviensis* and *Cordia abyssinica*.

Mrs. H. A. Fowler, Winnipeg.—Seeds of *Gentiana* spp.

Mr. P. Ross Frames, Kenilworth, Nr. Cape Town.—Plants of *Lithops* and *Conophytum* spp. received through the Bolus Herbarium.

Mr. H. B. Garrett, Chiangmai, Siam.—Plants of *Pleione* and *Bulbophyllum* species.

Professor Dr. H. Glück, Heidelberg.—Plants of *Limosella subulata* forma *submersa* from Wales.

Mr. F. D. Golding, Ibadan, Nigeria.—Seeds of an aquatic plant (*Dopatrium longidens*) found at Jos, N. Nigeria.

Mr. J. Gossweiler, Luanda, Angola.—Seeds, including *Kalanchoë* sp. nov. and *Schefflera* sp.

Colonel C. H. Grey, Cranbrook.—Plants, including aquilegias from the Rockies, *Aristea* sp. etc.

Mr. N. G. Hadden, West Porlock.—Plants, including *Paeonia anomala* var. *Beresowskyi* and *Hydrocotyle dissecta*.

Mr. F. J. Hanbury, East Grinstead.—A collection of seedling orchids and a plant of *Renanthera coccinea*.

Miss Thistle Y. Harris, Sydney.—A collection of ferns ; also a large consignment of seeds and fern spores.

Mrs. M. V. A. Hewett, Bicester.—A miscellaneous collection of Burmese orchids.

Messrs. Hillier & Sons, Winchester.—Shrubs.

Mr. G. B. Hinton, Mexico.—Several consignments of seeds of interesting plants including *Sphinctospermum constrictum*, *Cassia Hintoni* (sp. nov.) an arborescent *Senecio*, and the crimson-flowered *Gentiana salpinx*.

M. Louis Van Houtte, Père, La Pinte lez Gand.—A collection of stove plants.

Mr. H. H. Hume, Gainesville, Florida.—Bulbs and seeds of *Zephyranthes* spp. and varieties.

Miss I. W. Hutchison, Haddington.—Seed and specimen of *Primula eximia* collected in Nome by Mr. Thornton.

Major L. Johnston, Hidcote, Glos.—Plants, bulbs and seeds from both Hidcote and Mentone.

M. Paul Kestner, Lausanne.—Plants of *Nephrodium Borbasi*, *Aspidium Braunii* and *Scolopendrium Hemionitis*, also spores of *Cheilanthes* and *Phegopteris* spp.

Knap Hill Nursery Ltd., Woking.—Shrubs, bulbs and seeds.

Mr. C. H. Lankester, Costa Rica.—Collections of orchids; also spp. of *Melocactus*, *Lycopodium*, *Marattia*, etc.

Messrs. Laxton, Bros., Bedford.—Plants (roses).

Dr. F. Lemperg, Hatzendorf.—Plants and seeds, principally alpine subjects.

Miss Nancy Lindsay, Abingdon.—A collection of shrubs, bulbs and seeds collected by her in Persia.

Mr. A. Lovejoy, Durban.—Plants of *Stapelia* spp.

Mr. W. J. Marchant, Staplehill, Wimborne.—Shrubs, including spp. of *Daphne*.

Mr. G. E. Martindale, London.—A collection of bulbs and seeds from Majorca.

Mrs. M. M. Michelmores, Chudleigh, South Devon.—Plant of ? *Bulbophyllum* sp., tuber of *Eulophia* sp. and seeds of *Haemanthus* sp., from Tanganyika, coll. by Mr. A. P. G. Michelmores.

Mr. F. W. Millard, East Grinstead.—Collections of alpines, including N. American species new to cultivation at Kew.

Sir William Milner, Appletreewick, Yorkshire.—Plant of *Adenocarpus Bacquei*, cuttings of *Fabiana imbricata* var. *coerulea*, etc.

Messrs. Mitsubishi Shoji Kaisha, Ltd., London.—A collection of bulbs of *Lilium* species.

Mocambo Cacao Estates, Brazil.—Pod of "Maranhao" Cacao, brought to Europe in the Graf Zeppelin by Mr. Ff. Bellairs.

Mr. R. Mountford, Nairobi.—Roots of *Canarina abyssinica* from the crater of Meninai, Kenya Colony.

Professor P. A. Munz, Claremont, California.—Seeds of *Oenothera macrosiphon* and *O. longissima*—two rare and rather remarkable species from inaccessible places in New Mexico and South Eastern Utah respectively.

Mr. J. C. Nauen, Coventry.—A collection of seeds and fern spores from Bermuda.

Mrs. Beatrix Nunn, Tarkwa, Gold Coast Colony.—Seeds of *Musa* sp. from a tree growing about 100 miles west of Tarkwa.

Mrs. Clarice Nye, Prospect, Oregon.—Several consignments of interesting seeds, including *Hesperochiron californicus*.

The Rt. Rev. R. S. More O'Farrell, The Lord Bishop in Madagascar.—Plants, a collection of rare species comprising the following:—*Decarya madagascariensis*, *Alluaudia procera*, *A. dumosa* (dead on arrival), *A. Humbertii*, *A. comosa* and *Didiera madagascariensis*.

Mr. L. Palmer, Forestal Land, Timber & Railways Co., Ltd., London.—Collections of seeds from Argentina.

Major Albert Pam, Broxbourne.—Bulbs and corms from Cyprus, rhizomes and seed of *Bomarea* spp., bulbs of *Pamianthe quitoensis*.

Messrs. Perry's Hardy Plant Farm, Enfield.—Plants and seeds.

Dr. K. von Poellnitz, Altenburg, Thüringen.—Plants and cuttings.

Sir John Ramsden, Bulstrode.—Plants, rhododendrons.

Miss M. Rathbone, Hayes, Kent.—Plants of damask roses, old-fashioned white pinks, and bulbs of *Galanthus* species.

Prof. E. Reuter, Helsingfors.—A collection of seeds.

The Lady Rockley, Lytchett Heath.—A collection of plants including spp. of *Hibiscus*, *Melaleuca*, *Callitris* and *Albizia*., also *Stapelia Planti*.

Mr. C. Gilbert Rogers, Etchingham, Sussex.—Plants of *Lobelia Telekii* and *Kniphofia Snowdeni*.

Mr. Lionel de Rothschild, Exbury.—Plant of *Rhododendron Lady Chamberlain*; tubers of *Nymphaea* "Jupiter."

Messrs. Herbert J. Rumsey & Sons, Ltd., Dundas, New South Wales.—A shipment of plants, most of which, unfortunately, did not survive the journey; also seeds and fern spores.

Hon. Mrs. E. F. Ryder, Beaulieu.—Plants, a large number of spp., of *Haworthia*, also *Faucaria Jamesii*, from South Africa; tubers of *Pelargonium* spp., seeds of *Bryomorpha Zeyheri*; also a collection of seeds of succulents.

Mr. W. A. Schipp, British Honduras.—A Wardian case of plants, the shipment of which was arranged by the Agricultural Officer, British Honduras, and the Superintendent of Gardens, Hope, Kingston, Jamaica.

Colonel R. C. F. Schomberg.—A collection of seeds from the Karakoram received through Mr. David McLean, Brighton.

Mr. R. Seligman, Wimbledon Common.—Plant of *Wormskioldia longipedunculata* from Kreuger National Park, Transvaal.

Messrs. W. C. Slocock, Ltd., Woking.—Plants, including *Acanthopanax ricinifolius*.

Mr. J. T. Smith, St. Nicholas, Cardiff.—Plant of *Cotyledon Peacockii*, a rare species.

Mr. H. J. Solomon, Sydney.—Seeds, including *Owenia* spp. and varieties, *Anacampseros rufescens*, *Microloena stipoides*, and plants of *Echeveria Wardii*.

Herr L. Späth, Berlin.—A collection of trees and shrubs.

Mrs. F. N. Stagg, Sevenoaks.—Seeds, *Sabinea carinalis*, *Beaumontia grandiflora* and *Jatropha podagrica* from Antigua.

Major F. C. Stern, Goring-by-Sea.—Several consignments of plants, including collections of shrubs, alpines and irises, seeds and bulbs.

Mrs. C. W. Stewart, Worcester.—Seedlings of *Cardamine Impatiens* L. var. *poterifolia* from the original plant named by Dr. G. C. Druce.

Messrs. Sutton & Sons, Ltd., Reading.—Plants, cuttings and seeds.
 Mr. P. M. Synge, West Byfleet.—A collection of lobelias and helichrysums from Mts. Ruwenzori and Elgon.
 Dr. A. Tischer, Siegburg, Germany.—Seeds and plants of species of *Lithops*, *Conophytum*, *Titanopsis* and *Fenestraria*, etc.
 Mr. A. W. Trethewy, London.—Collections of seeds from Morocco.
 Professor R. S. Troup, Oxford.—Seeds collected in East and South Africa.
 Mrs. J. H. Vaughan, Zanzibar.—Pseudo-bulb of *Eulophidium zanzibaricum*, which has never previously been in cultivation.
 Sir Oscar Warburg, Headley.—A collection of trees and shrubs ; also seeds, from Roumania, of *Quercus* spp.
 Captain G. F. Warre, Roquebrune, A. M., France.—Plants, including spp. and varieties of *Acacia* and *Nerium* ; also a collection of roses.
 Messrs. John Waterer, Sons & Crisp, Ltd., Twyford and Bagshot.—A collection of herbaceous plants ; also a number of choice rhododendrons.
 Mr. F. A. Weinthal, Roseville, N.S.W.—Orchids.
 Mr. G. E. Wolstenholme, La Paz, Bolivia.—Seeds and fern spores.
 Messrs. W. Wood & Son, Ltd., Taplow.—A collection of herbaceous plants.

DISTRIBUTION OF PLANTS AND SEEDS.—In connection with the annual distribution of seeds, 180 separate consignments were despatched during the early months of the year, comprising 5101 packets of herbaceous plants and 4934 packets of trees and shrubs. The aggregate shows an increase of 72 packets as compared with the figures for the previous year.

Species specially distributed were *Erythrina acanthocarpa*, from South Africa, *Theobroma Cacao*, from Trinidad, *Zizania aquatica*, from Massachusetts, varieties of Cow Peas (*Vigna unguiculata*) from Northern Nigeria, and *Quercus Mirbeckii*, *Aesculus californica* and *A. indica*, seeds of which were harvested at Kew.

Shipments of plants overseas—mainly in Wardian cases—were as follows : Agricultural Departments of Seychelles ; Zanzibar (*Eugenia* spp.) and Nigeria (2 consignments). Botanic Garden, Hobart, Tasmania ; East African Agricultural Research Station, Amani ; Imperial College of Tropical Agriculture, Trinidad (Banana suckers, and seedling plants of *Theobroma Cacao* raised at Kew from seeds transported in the Graf Zeppelin from Brazil) ; Government Gardens, Khartoum ; St. George's Park, Port Elizabeth, South Africa ; National Zoological Garden, Pretoria ; and Messrs. Duncan and Davies, New Plymouth, New Zealand. In addition a consignment of plants of *Bignonia venusta*, received from Amani, was re-shipped to the Department of Agriculture, Barbados.

Other recipients of material included the following :—
 Admiralty Compass Observatory, Slough.—Trees and shrubs.
 Amani, East African Agricultural Research Station.—Suckers of musas.
 Arnold Arboretum, U.S.A.—Seeds and grafts of trees and shrubs.
 Berkeley, California, College of Agriculture.—Seeds of composites.
 Berlin-Dahlem, Botanic Garden.—Grafts and cuttings of hardy trees and shrubs.
 Bristol University.—A collection of plants and cuttings, including *Ixora* spp.
 Calcutta, Royal Botanic Garden.—Seeds of *Begonia* spp.
 Cambridge, Botanic Garden.—Plants, including *Kalanchoë* spp., *Lindbergia grandiflora* and *Jasminum rex*.
 Chelsea Physic Garden, London.—Plants, including *Marsilia* spp. *Begonia* spp., and cycads.
 Civil Service Sports Ground, Chiswick.—Shrubs and herbaceous plants.
 Copenhagen, University Botanic Garden.—Plants of *Rhododendron* spp.
 Cuba, Harvard University Botanical Garden, Cienfuegos.—Plants of *Aristolochia* spp.
 Ealing, Parks Department.—A collection of stove plants.
 Edinburgh, Royal Botanic Garden.—A collection of palms, nepenthes and herbaceous plants.
 Fleetwood, Lancs., Parks Department.—A collection of trees and shrubs.
 Glasgow, Botanic Garden.—Plant of *Eichhornia speciosa*.
 Glasnevin, Botanic Garden.—Plants, seeds and cuttings ; also a collection of ferns.
 The Hague Public Parks, Holland.—Grafts of hardy trees and shrubs.
 Heidelberg University, Germany.—Plant of *Limosella Merenskyana*.
 Hendon, Education Committee.—Aquatics.
 Hornsey Public Parks, London.—Cuttings of hardy shrubs.
 Hyde Park, London.—Plants, seeds and cuttings.
 John Innes Horticultural Institution, Merton.—Plants, seeds and cuttings.
 Ministry of Labour, Claims and Record Offices, Kew.—A large collection of hardy trees and shrubs.
 Leicester, Museum and Art Gallery.—Plant of *Isoetes malivernianum*.
 Manchester, Parks Department.—A collection of succulents.
 New York, Botanic Garden.—A collection of pelargoniums and begonias.
 Oxford, Botanic Garden.—Tubers of *Nymphaea gigantea*.
 Paris, Museum national d'histoire naturelle.—A collection of ferns.

Potsdam, Sans Souci Gardens, Germany.—Cuttings of *Aeschynanthus* and *Columnnea* spp.
 Pretoria, National Zoological Gardens, South Africa.—A collection of orchids, bulbs, etc.
 Punjab and N.W. Frontier Province, Forestry Department.—Cuttings of Poplars.
 Regents Park, London.—Alpines and plants of *Sutera grandiflora*.
 Richmond, Surrey (Terrace Gardens).—A collection of *Iris*.
 Soldiers, Sailors and Airmen's Families Association, Wimbledon.—Plants of *Ginkgo biloba* and flowering shrubs.
 St. Helena, Agricultural & Forestry Office.—Plants, including *Pelargonium radula*.
 Swansea, Parks Department.—A collection of greenhouse plants and seedlings of *Aesculus indica*.
 Torquay, Parks Department.—A collection of herbaceous and alpine plants and seeds.
 Trinidad, Imperial College of Tropical Agriculture.—Seeds, plants and suckers of musas.
 Washington, United States Department of Agriculture.—Plants of *Arundinaria* and *Bambusa* spp.
 Windsor, Royal Gardens.—Bougainvilleas.
 Wisley, Royal Horticultural Society's Garden.—Alpines and herbaceous plants.

Private Recipients :—

Lord Aberconway, Bodnant.—A collection of Mexican oaks.
 Mr. V. Alvarez, Managua, Nicaragua.—Plants of *Derris elliptica*.
 Mr. E. Ashby, Blackwood, South Australia.—Cuttings of *Rhipsalis* spp.
 Mr. G. P. Baker, Sevenoaks.—Plants of *Salix reticulata*, *Euonymus kewensis* and other shrubs.
 Mr. P. K. Barr, Oxhey.—*Helleborus* spp.
 Mr. L. S. Bartlett, Ascension Island.—Collections of seeds of trees, shrubs and herbaceous plants for experimental planting.
 Lady Muriel Jex-Blake, Nairobi.—A collection of plants, including *Ceropegia* spp.
 Mr. H. A. Brown, South Chingford.—Cuttings of *Fuchsia* spp.
 Mr. J. R. Brown, Pasadena, California.—*Haworthia* spp.
 Messrs. G. Bunyard & Co., Ltd., Maidstone.—*Rosa* spp.
 Messrs. Cadbury Bros., Bournville.—Seedlings of *Theobroma Cacao*.
 Prof. Dr. Mario Calvino, San Remo, Italy.—Plants of *Lonchocarpus Nicou* and *Derris elliptica*.
 Messrs. Charlesworth & Co., Ltd., Haywards Heath.—A collection of orchids.
 Miss D. A. Chaytor, Darlington.—Hardy shrubs and plants of *Lavandula* spp.
 Col. Stephenson R. Clarke, Haywards Heath.—A collection of seedling Mexican oaks, and plants of *Salvia Greggii*, *Camellia maliflora*, etc.

Mr. S. Courtauld, Eltham.—Plants of *Liriope spicata* var. *angustifolia*.
 Mr. G. A. Courthorpe, Chagford.—Alpines and rhododendrons.
 Dartington Hall, Totnes.—Herbaceous plants and hardy trees and shrubs.
 Mr. J. Davis, Belmore, New South Wales.—A collection of fern spores.
 Donard Nursery Co., Newcastle, Co. Down.—Hardy trees and shrubs.
 M. L. Dutrie, Meirelbeke, Belgium.—Plants and cuttings of stove plants.
 Mr. A. Ezra, Cobham.—Collection of trees, shrubs and herbaceous plants.
 Lady Game, Blandford.—Seedling primulas.
 Commander F. Gilliland, Londonderry.—A collection of Mexican oaks.
 Mr. R. S. Glover, Oakland, California.—A collection of seeds of *Rhododendron* spp.
 Hon. Mrs. E. L. Grant, Leiston.—Plants, including *Brunfelsia calycina* and a collection of ferns.
 Col. C. H. Grey, Cranbrook.—Plants of *Blandfordia marginata*, *Lysichitum americanum*, and alpines.
 Mr. S. H. Griffin, Churt.—Succulents.
 Mr. A. Grove, Kew.—Liliums.
 Mr. N. G. Hadden, West Porlock.—Alpine and herbaceous plants.
 Dr. F. H. Rodier Heath, Weymouth.—A collection of succulents.
 Messrs. Hillier & Sons, Winchester.—Seeds, plants and grafts of hardy trees and shrubs.
 M. Louis Van Houtte, Père, La Pinte lez Gand.—Plants, seeds and cuttings.
 Messrs. G. Jackman & Son, Woking.—Cuttings of hardy trees and shrubs.
 Mr. A. T. Johnson, Conway, N. Wales.—A collection of alpines.
 Major L. Johnston, Mentone.—A collection of plants, and seedling Mexican oaks.
 Knap Hill Nursery, Ltd., Woking.—Plants, seeds and cuttings of hardy trees and shrubs.
 Mr. A. Krejei, Van Nuys, California.—A collection of ceropégias.
 Sir Charles Langham, Fermanagh.—A collection of trees and shrubs.
 Mr. C. H. Lankester, Costa Rica.—A collection of plants, including succulents.
 Mr. H. Q. Levy, St. Anne's, Jamaica.—Dendrobiums.
 Messrs. Stuart Low & Co., Enfield.—Grafts and cuttings of camellias.
 Mr. R. H. Macaulay, Argyll.—Alpines and herbaceous plants.
 Mr. W. J. Mackay, Durness, Sutherland.—A collection of rhododendrons.

Major Sir George Manners, Woodbridge.—A collection of plants, including *Jacaranda mimosifolia* and *Plumeria acutifolia*.

Mr. W. J. Marchant, Stapehill, Wimborne.—Plants and cuttings of hardy trees and shrubs.

Captain N. McEchearn, Pallanza, Italy.—A collection of seedling Mexican oaks.

Mr. F. W. Millard, East Grinstead.—Seeds and plants of alpiners.

Sir F. W. Moore, Rathfarnham, Co. Dublin.—Hardy trees and shrubs.

Mr. H. Armytage Moore, Saintfield, Co. Down.—Hardy trees and shrubs.

Mr. G. W. Olive, Dauntsey's School, West Lavington.—Seeds of hardy herbaceous plants.

Major Albert Pam, Broxbourne.—Collection of plants.

Messrs. Perry's Hardy Plant Farm, Enfield.—Aquatics and seeds of *Victoria regia*.

Dr. K. von Poellnitz, Altenburg, Thüringen.—A collection of *Echeveria* spp.

The Marchioness of Reading, Walmer Castle.—A collection of shrubs and climbing plants.

Mr. Lionel de Rothschild, Exbury.—A collection of Mexican oaks; plants including *Clivia kewensis*, and *Prunus campanulata*.

Messrs. B. Ruys, Ltd., Dedemsvaart, Holland.—Plants and seeds, including *Jasminum* spp.

Hon. Mrs. E. F. Ryder, Beaulieu.—Succulents, including *Stapelia* spp.

Messrs. Sanders, St. Albans.—A collection of orchids.

Mr. L. H. Saunders, Nigeria.—Plants, including *Strelitzia reginae*, *Pelargonium kewensis*, etc.

Mr. T. Sharp, Westbury.—Succulents.

Messrs. W. C. Slocock, Ltd., Woking.—Grafts and cuttings of hardy shrubs.

Major A. A. Dorrien-Smith, Tresco.—A collection of Mexican oaks.

Mr. O. H. Smith, Morvern, Argyll.—Bulbs of *Lilium* spp.

Herr L. Späth, Berlin.—Grafts of *Prunus subhirtella* var. *autumnalis*.

Lady Beatrix Stanley, Market Harborough.—Alpiners and herbaceous plants.

Major F. C. Stern, Goring-by-Sea.—Plants, seeds, and a collection of mesembryanthemums.

Mr. J. B. Stevenson, Ascot.—Plant and grafts of *Rhododendron serotinum*.

Miss A. F. Strickland, Wimbledon.—A small collection of palms.

Sir Stephen Tallents, Dartford.—Cuttings of *Salix* spp.

Mr. K. Wada, Numazu-shi, Japan.—Seeds of *Rhododendron* spp.

Messrs. R. Wallace & Co., Ltd., Tunbridge Wells.—Grafts of *Rosa* spp., seeds of *Berberis* and *Cotoneaster* spp.

Sir Oscar Warburg, Headley.—A collection of seedling Mexican oaks, and plants of *Davidia Vilmoriniana*.

Captain G. F. Warre, Roquebrune, A.M., France.—A collection of plants, including camellias in variety.

Messrs. J. Waterer, Sons & Crisp, Ltd., Bagshot.—Plants and cuttings of hardy trees and shrubs.

Dr. J. Cromar Watt, Aberdeen.—Pelargoniums.

Mr. J. C. Williams, Caerhays.—A collection of Mexican oaks.

Mr. E. L. Winter, Bude.—A collection of bog plants.

Professor O. F. Wuyts, Gand-St. Pierre, Belgium.—Seeds and grafts of rhododendrons.

Bedgebury

The year has been an unsatisfactory one so far as tree growth is concerned. Following a mild winter young shoots were developing early in May on many species of conifers, particularly the Chinese abies and piceas, when, during the night of May 16th and early morning of May 17th, a severe frost occurred which not only killed every young shoot but also some of the previous year's wood. A full account of the effect of this frost will appear in K.B. 1936, no. 1.

The unusually severe check to the trees was very noticeable in the length of time taken by many of them to form new shoots from dormant buds. Some grew again within a few weeks, but many showed little movement before August. A few died and recovery in other cases is still doubtful. Owing to the very wet and mild autumn some trees—especially those that began growing in August—continued to grow until October, when, owing to the unripe condition of the wood, they were again injured by frost.

Green spruce aphid was prevalent in spring and autumn but was not troublesome in summer. Moist climatic conditions appear to favour its spread; when a hot dry period occurs the pest practically disappears. *Dreyfusia nüsslinii* was prevalent on some of the firs—especially those that suffered most from frost injury. Pine-shoot moth caterpillars (*Retinia* spp.) were prevalent on many of the pines and a good deal of hand-picking of affected buds has been carried out. The removal of resin masses containing larvae is also receiving attention. The most serious fungus disease has again been *Armillaria mellea*. It has been responsible for the death of several well-grown young trees.

In some species height growth for the year has reached the average for the last few years, but many have only grown at about one third the normal rate, and some that were badly frozen are actually shorter than they were a year ago. The rainfall for the year was 41.03 inches. Four or more inches of rain fell during each of the following months, February 4.88; April 4.06; August 4.46; September 5.12; October 4.07; November 7.02.

Wind disturbed some of the young trees but there was no serious injury from that source. No trees were blown down by the violent storm that occurred in late September, but several oaks lost a number of limbs.

This being the tenth year from the time planting was commenced, the trees have been re-measured and it is now possible to judge which species are unlikely to succeed or will only do so when special conditions are created. Most of the semi-tender trees such as all species of *Callitris* and *Widdringtonia*, tender species of *Juniperus*, *Cupressus*, *Pinus*, *Abies*, *Tsuga*, *Podocarpus* and a few other genera have been killed by cold, but in a few instances one or two trees out of several of a doubtfully hardy species are still alive and growing reasonably well. That is so with two trees of *Pinus caribaea*. Thirteen plants 9 inches high were planted in 1926. All died but two and they are now 10 feet high and 8 feet 6 inches respectively. They are given some protection from cold winds in winter and spring by the erection of screens of branches. *Pinus patula* has on several occasions been reared to a height of 4 or 5 feet and has then been killed by cold. A plant of *Taiwania cryptomerioides* has stood with some winter protection since 1926, and although it does not increase much in height it is a well branched healthy bush. A number of young plants of *Pinus Montezumae* and *P. palustris* appear to be established after several previous trials. Two pot plants of the Mexican *Pinus Greggii* taken from the Temperate House at Kew in 1926, are now 18 feet and 13 feet high, and as they appear to be perfectly healthy it is hoped that they will now withstand the coldest period that is likely to occur.

There have been difficulties in finding the right place for certain plants and more moving about still remains to be done. Some of the golden-leaved yews made little progress as long as they were left on an open sunny bank, but appear to be growing better after removal to a lightly-shaded position. Of six plants of *Torreya nucifera* 6 inches high, planted from pots in 1926 under identical conditions, and within a few feet of each other, only one grew satisfactorily, the others became stunted and yellow. In 1930 the five poor plants, not more than 9 inches high, were moved to another position, two died, and the other three now measure 2 feet 5 inches, 2 feet 9 inches and 2 feet 11 inches, respectively, in height. The undisturbed plant is 5 feet 2 inches high. *Podocarpus andina* (*Prumnopitys elegans*) grew very badly where it was originally planted, but is growing much better in another place. *Picea Omorika* has made fair progress planted amongst the other spruces, but some plants of similar age planted in another place have grown very much better. We have not yet found the ideal place for *Ginkgo biloba* but although tried in several positions it is not growing freely. Some species have been found to succeed most satisfactorily after being kept in a nursery until they were 2 or 3 feet high, others, particularly some of the pines, have given the best results when grown singly

in pots and planted out before they were a year old. In a few cases pine seeds have been sown in prepared ground in order that there should be no root disturbance. *Pinus Pineae* was very difficult to establish from ordinary nursery plants. There has also been a good deal of trouble with *P. halepensis* but in that instance climatic conditions are at fault.

Possibly the most unsatisfactory genus as a whole is *Picea*. That may be due to frequent attacks by green spruce aphid which have necessitated the constant use of insecticides. The newer Chinese species of *Abies* and *Picea* are generally less satisfactory than the better known species. They are inclined to grow too early and on several occasions have had the young shoots killed. *Abies koreana* appears to be less liable to injury by spring frosts than other species.

Up to the present time, we have been unsuccessful with *Larix Griffithii* but a further trial should be made. *L. Potaninii* does not take kindly to Bedgebury conditions although several plants are in a fairly healthy state. *Larix decidua* (*europaea*), represented by several geographical forms, has grown very well, the tallest tree is 33 feet high and there are others varying from 27 to 32 feet. They were between 2 and 3 feet high when planted in 1925. *L. Kaempferi* (*leptolepis*), *L. eurolepis* and *L. laricina* (*americana*), have all grown well. *L. Gmelini* (*dahurica*) and varieties, and *L. occidentalis* are irregularly developed. *Cedrus atlantica* and *C. Deodara* have grown better than *C. Libani*, with one exception the latter trees are stunted. Several of the North American *Abies* have made good progress, especially *A. concolor*, *A. Lowiana*, *A. grandis*, *A. nobilis* and *A. magnifica*. The best tree of *A. Lowiana* is 28½ feet high and the best tree of *A. grandis* measures 21 feet. Some of the *Abies* have had soft leaders broken by birds. *A. Fraseri*, *A. balsamea* and *A. sibirica* are generally unsatisfactory.

The various species and varieties of *Chamaecyparis* and *Cupressus* are growing well, except when tender species have been injured by cold, and certain varieties have been attacked by *Armillaria mellea*. Thujas on the whole are thriving, the most unsatisfactory being some of the smaller varieties of *T. orientalis* which are not very healthy. Two or three trees have been killed by honey fungus. The best tree of *Cupressus arizonica* is 17 feet 6 inches high, *C. macrocarpa* is 20 feet, *C. macrocarpa* var. *lutea* 21½ feet, *C. Goveniana* 12½ feet, but there were many losses before these species could be established. *Chamaecyparis nootkatensis* is very vigorous, the largest tree planted in 1927 is now 16 feet high. Some of the varieties of *C. Lawsoniana* are from 12 to 18 feet high. The variety *Pottensii* has suffered severely from honey fungus, 5 plants out of 10 being killed after they had grown to a height of 5 feet. *Pinus nigra* and varieties, *P. Pinaster*, *P. leucodermis*, *P. Thunbergii*, *P. sylvestris*, *P. ponderosa*, *P. Coulteri*, *P. Banksiana* and others have grown well but we have lost a number of trees, 6 to 12 feet high, through honey fungus. Some of the species to suffer were *P. Coulteri*, *P. Sabiana*, *P.*

Banksiana and *P. Cembra*, several five-leaved pines have also been killed by *Cronartium ribicolum*. The most satisfactory species of this group are *P. Armandii*, *P. Peuke*, *P. monticola*, *P. flexilis* and *P. parviflora*. *Pinus attenuata (tuberculata)* has grown well but is not in a satisfactory condition, the leaves have been yellow for a number of years and the general condition suggests unsatisfactory root action, although other pines nearby look perfectly healthy.

Cryptomerias, *Athrotaxis*, *Sciadopitys verticillata*, *Cunninghamia lanceolata*, *Fitzroya patagonica*, and others are growing well, and although numerous losses have occurred, the general condition of the trees in the Pinetum at the end of the first ten years is satisfactory.

The Museums

As usual the routine work of correspondence and attention to visitors has absorbed most of the time of the staff. A good deal of relabelling has been necessary, for, in addition to the usual change of labels every few years owing to discoloration, many name changes had to be made owing to the exigencies of the International Rules of Nomenclature.

Dr. F. N. Howes has carried out investigations upon vegetable waxes and Dr. R. Melville has got together information upon the 200 or more different kinds of woods that have been given the name of mahogany, with or without a descriptive prefix. The Keeper has compiled an account of the correspondence and official minutes concerning the National Pinetum at Bedgebury during its first 10 years. Numerous specimens have been collected and added to the Arboretum Herbarium.

Special exhibits have been made of woods known as mahogany, the various types of *Sorghum*, and of a series of acorns and acorn cups from numerous species of *Quercus*.

The interior of Museum 2 has been redecorated and a section of rough stone floor inside the east entrance has been replaced by a floor of cement. Much of the linoleum which had been in use for between 40 and 50 years has been replaced by new. The President of the Royal Academy very kindly inspected Miss North's oil paintings in the North Gallery to see whether any deterioration is taking place. The report was quite satisfactory, but rebacking and certain preservative measures were advised; these the Office of Works propose to undertake in the near future. The interior of the Studio attached to the North Gallery has been redecorated and electric light installed. Lights have also been placed over the case devoted to special exhibits in Museum 1.

Mr. J. Addens spent several weeks in the Museums' Library on work connected with the opium poppy, and Mr. A.

Grant undertook three months' research on East African timbers. Sir John Buchan-Hepburn, Bart., is spending the winter at work as an honorary assistant in the Arboretum Herbarium.

Duplicate Museum specimens have been distributed to Mr. E. W. Carls, Idaho, U.S.A.; Miss M. Cunningham, Shepherds Bush; Herr W. Hieber, Bayreuth; Dr. F. Hockmann, Brussels; Mr. E. Milton, Torquay Museum; Dr. J. Muir, Riversdale, S. Africa; Mr. S. T. Parkinson, South Eastern Agricultural College, Wye; Professor S. L. Vella, University of Malta; and Mr. J. Wiles, Richmond.

PRESENTATIONS TO MUSEUMS.—Mr. D. Baird, Drumoak; plank of Douglas fir from Kennel Wood.

Lt.-Col. R. W. Barclay, Dorking; branches of *Pinus attenuata* and cones.

Mr. W. G. Barnard, Lydenburg, Transvaal; stem of *Vellozia equisetoides* and a brush made from it.

Dr. G. A. Buckmaster; *Posidonia* balls from the Murray River, South Australia.

Mr. I. H. Burkill, Kew; buttons and cigarette holder made from seeds of *Raphia* sp.

Messrs. Cadbury & Co., Ltd., Bournville; specimens relating to cocoa manufacture.

Messrs. Chiswick Products, Ltd.; waxes used in polish making.

Messrs. Chivers & Sons, Ltd., Histon; bottled fruits.

Mr. T. D. A. Cockerill, Ashland, Oregon; photographs of the Hooker oak, *Quercus lobata*.

Dr. H. E. Durham, Hereford; photographs of mistletoe on various hosts.

Mr. R. A. Dyer, Division of Plant Industry, Pretoria; samples of "Dagga," *Cannabis sativa*, as smoked by natives.

Captain Erskine, H.M. Consul, Gore, Abyssinia; specimens of Abyssinian woods.

Director, Forest Products Research Laboratory, Princes Risborough; timber specimens.

Messrs. J. Harris & Son, Swansea; log of oak dug up during excavations.

Mr. N. B. Helmsing, Hull; specimens of wood.

Mr. J. H. Holland, Ealing; sections of fishing rods made from bamboo, and 48 lantern slides.

Dr. D. Hooper, London; piece of wood grown through a flint, and a box made of burr wood.

Dr. F. N. Howes, Kew; seeds of soy beans and other pulses.

Miss M. S. Johnston, Kew; silver medal of Horticultural Society, London, presented to Mr. E. Johnston in 1836.

Director of Agriculture, Kenya; sample of *Artemisia brevifolia* grown at Molo.

Lt.-Col. W. B. Lane, London ; oak manna from Kurdistan and a sweetmeat made from it in Baghdad.

Mr. J. N. D. La Touche, Craven Arms ; *Acacia Catechu* wood found while excavating for a dock at Bombay.

Dr. J. Muir, Riversdale, South Africa ; drift seeds from the Riversdale coast.

Miss E. R. Napier, Nairobi, Kenya ; geocarpic fruit of *Cucumis humifructus*.

The Palma General Fibre Co., Ltd., London ; sample of Palma fibre from Mexico.

Dr. Robertson, London ; walking stick of bog oak.

Mr. A. J. Sadler, New Malden ; Malayan seeds.

Dr. H. G. Schweickerdt, Kew ; fruits and seeds of *Monsonia umbellata*.

Mr. L. G. Shadbold, Managing Director, Star Brush Co., London ; exhibit showing stages in manufacture of nail brushes from Ixtli fibre.

Director, Botanic Gardens, Singapore ; 12 specimens of timbers.

Mr. C. G. Trapnell, N. Rhodesia ; resins from a number of African trees.

Miss S. Vincent, Ross Is., South Andaman Islands ; seeds of the talipot palm.

Mr. S. F. H. Wemyss, Colombo, Ceylon ; brick tea from Hongkong prepared for the Russian market.

Sir W. Wright-Smith, Royal Botanic Gardens, Edinburgh ; section of wood of *Paulownia tomentosa* (*P. imperialis*).

Jodrell Laboratory

There has been an increase in the number and scope of the enquiries dealt with at the laboratory this year. As usual, most of the routine work has consisted in identifying timbers, fibres, barks and other miscellaneous botanical material by a study of its anatomy. Owing to the steady growth of the collection of permanent microscopical slides it has been possible to carry out many of these identifications far more expeditiously than was possible in the past.

Some of the more unusual items included the following : roots stated to have been blocking up drain pipes in one instance were found to be elm and in another willow : a "water chestnut" from China was identified as a corm of *Eleocharis tuberosa* Schultes : material vomited by a poisoned dog proved to be the remains of some hazel nuts : and "powder" from the wallpaper in a damp room consisted of fungus spores. A number of samples of kapok, whose buoyancy was stated to be unsatisfactory, were found to contain an admixture of cotton or other fibres, and in some instances no kapok at all. At the request of the British Museum laboratory the fibres used in the manufacture of the paper on which some alleged 6th century Chinese pictures had been painted were examined. This helped to establish that the pictures in question were not genuine.

Physiological enquiries concerning the effect of ultra-violet light on plants, the ascent of sap in trees, respiration, photosynthesis and damage to greenhouse plants after fumigation have also been dealt with.

One of the most interesting special investigations has been concerned with measures to prevent greenhouse plants from being damaged by toxic substances present in the atmosphere during foggy weather. This work, which is still in progress, is being carried out in co-operation with the gardens staff, and much valuable assistance has also been afforded on the chemical side by members of the staff of the Government Laboratory, and other chemists and physiologists interested in the subject. The investigation on the morphology of the single cotyledon of *Ranunculus Ficaria*, mentioned in last year's report, has been completed and an account has been published in the "Annals of Botany." The mode of fertilization, the causes of the frequent sterility and the production of bulbils in the leaf axils of *R. Ficaria* are still under investigation.

The number of visitors working at the laboratory has been considerably greater than in any recent year, and some of them are still engaged in prolonged investigations. The work of Mr. J. Pryde, who is making a study of the anatomy of, and identifying the chemical substances present in a number of different kinds of wood from South Africa, is especially worthy of note. Other visitors included the following : Mr. R. A. Blakelock (rhizomes), Mr. L. A. Boodle (identification of botanical remains excavated from the Egyptian tombs), Mr. Booth (fixing material for cytological purposes), Mr. I. H. Burkill (*Tamus*, etc.), Miss W. M. Curtis (morphology and anatomy of *Taraxacum*), Mr. A. D. Grant (wood structure), Mr. A. F. Mir (general elementary studies), Mr. S. Ramanjam (cytology), Mr. D. P. Watson (structure and germination of leguminous seeds).

The Herbarium

EUROPE, NORTH AFRICA, AND THE ORIENT.

The year 1935, compared with the previous year, saw a considerable increase in the number of specimens received for incorporation in this department of the Herbarium. 24,886 numbers (sometimes a single number needing 2 or 3 sheets in mounting) have been presented or purchased. This figure includes 10,714 numbers received for identification or verification, but does not include single specimens or small parcels sent for determination by correspondents. 12,225 sheets have been mounted, additional to about 8,000 of the sheets from the Fraser herbarium which were already mounted on sheets of the Kew size. Approximately 16,000 sheets have been laid in.

These figures indicate a marked lag in mounting, which was due mainly to mounters being detailed for other work than mounting for the department.

During the year the staff has concentrated on the identification of new material and a large proportion of the collections sent in by correspondents has been determined. The genera *Doronicum*, *Pimpinella*, *Carum*, *Nonnea*, and *Arnebia* have been rearranged.

Considerable additions to the British collections have been made by members of the Herbarium staff, and include plants from Dorset, Surrey, Norfolk, Devon, Wiltshire, Gloucestershire, Suffolk, Hampshire, Somerset, and Ireland. Miscellaneous British collections were received from Messrs. J. E. Lousley, G. E. Martindale, H. S. Redgrove, and H. N. Ridley, Mrs. C. I. Sandwith, Messrs. A. C. Trott, T. G. Tutin, E. C. Wallace, and J. W. Wyatt, and the Botanical Society and Exchange Club of the British Isles, and valuable collections from Ireland were received from Messrs. J. R. Sealy, B. L. Burt and Miss Ross-Craig. Material from Scotland was presented by Mr. C. E. Elton and Mrs. M. L. Wedgwood. A valuable collection from Jersey was sent by Mr. R. L. Proudlock.

The most important single addition to the British collections was the fine herbarium of the late Mr. J. Fraser, which was presented, shortly after his death and at his written request, by his relatives. An account of Mr. Fraser's botanical activities and of his botanical collections was published in the *Kew Bulletin*, 1935, 97.

Important collections of plants (totalling over 2,000 numbers) from the Balkan Peninsula have been received during 1935. These include Greece (Mr. S. C. Atchley); Albania (Mrs. R. V. Pennington); Dalmatia (Mr. B. Gilliat-Smith); S. Macedonia and Thrace (Mr. E. K. Balls, Prof. R. M. Dawkins, Mrs. F. S. Loch, Mr. H. G. Tedd); N. Macedonia (Rev. and Mrs. H. P. Thompson); and Bulgaria and the Dobruja (Dr. T. Wisniewski). Mr. A. K. Jackson, Mr. H. Montford and Dr. W. B. Turrill with a party of other botanists visited western Yugoslavia and the Karst in the spring. Their floristic and ecological studies included the preparation of 420 numbers of herbarium specimens, and many bulbs and packets of seeds, all of which were presented to Kew. Messrs. A. H. G. Alston and N. Y. Sandwith again explored parts of Albania and have presented to Kew a fine collection of 510 herbarium numbers and 120 packets of seeds. In addition the following specimens were purchased: Albanian plants from Dr. K. H. Rechinger and *Plantae balcanicae* (montenegrinae) exsiccatae from Dr. J. Rohlena.

Valuable collections from the Iberian Peninsula have been received from Mr. S. C. Atchley, Dr. J. Cuatrecasas, Dr. W. B. Gourlay, and Mr. and Mrs. P. W. Scarlett, and *Flora iberica selecta*, cent. 1 was purchased from Dr. P. Font Quer. Mr. G. E. Martindale presented a useful set of specimens from the Balearic Islands.

Central and Northern European plants have been contributed in considerable numbers by Dr. R. W. Butcher (Germany), Lt.-Col.

H. Cottingham (Switzerland), Miss M. E. Edmonds (Austria), and Mr. W. T. Stearn (Germany, France). Fine series of specimens of critical Scandinavian species of *Rosa* and *Salix* have been presented by the Stockholm Museum. The following collections have been received in exchange: Czechoslovakia, *Flora Exsiccata Reipublicae Bohemicae Slovenicae*, cent. 10, from the Masaryk University, Brno; Estonia, *Eesti Taimed*, fas. 2, with summary, from Tartu University; Finland, *Plantae Finlandiae Exsiccatae*, cent. 11, 12, and 13. Dr. W. Beijerinck of Holland exchanged a valuable consignment of 59 varieties of *Calluna vulgaris*. A complete set of the varieties cultivated at Kew of this species was prepared for the Herbarium, with duplicates for Dr. Beijerinck, and a collection of 50 numbers, in duplicate, of wild variations was also made.

Dr. F. Lemperg and Dr. R. Seligman presented sets of Italian plants and Lt.-Col. C. H. Grey sheets of bulbous plants from Italy.

Mr. E. K. Balls continued his explorations in Asia Minor, the dried specimens being purchased by Kew. Other collections from the Orient included Iran (Mrs. V. Dickson, Mr. A. C. Trott); Arabia (Mrs. V. Dickson); Caucasus (Dr. P. L. Giuseppi); Afghanistan (Major W. R. Hay); Palestine (Miss S. Pares, Tel Aviv Indep. Biol. Lab., and the Department of Agriculture, Jerusalem). The Department of Agriculture, Cyprus, continued to send collections made by Mr. A. Syngrossides. A total of 462 specimens was received from Cyprus during the year.

Mr. A. W. Trethewy most kindly presented 409 sheets of plants collected by him in Morocco—a valuable addition to the somewhat meagre North African collections at Kew. Dr. René Maire presented a number of sheets of species of *Lavandula* from Morocco and Algeria. A set of 50 rare and endemic Moroccan plants was purchased from M. J. Gattefossé and some specimens (mainly from Tripoli and Sicily) were received from the Imperial Forestry Institute, Oxford.

The Royal Horticultural Society presented the type material of Botanical Magazine plates, and a valuable set, made by the late Dr. O. Stapf, of 170 sheets of the genus *Aconitum* (mostly European) was presented by Mrs. Stapf.

Miss D. A. Chaytor gave her services for a considerable part of the year. She assisted in the general routine work and has completed her revision of the genus *Lavandula*. A paper on the taxonomy of *Lavandula* (excluding cultivated varieties and hybrids) has been prepared for publication.

Mr. M. Hassib, of the Egyptian University, Cairo, spent six months at Kew, completing his research on the cultivated *Cucurbitaceae* of Egypt.

Mr. R. A. Blakelock has commenced as a voluntary assistant and research worker. He is helping in general herbarium routine and is also investigating the structure and ontogeny of British rhizomatous *Labiales*.

Miss W. M. Curtis is carrying out research on the anatomy and development of British *Taraxaca*, utilizing the material being grown in the Herbarium Experimental Ground.

Publications.—The Genus *Clypeola* and its intraspecific variation (K.B. 1935, 1).

On the Flora of the Nearer East: XVI (K.B. 1935, 54).

Fraxinus Pallisae and its Relationships (K.B. 1935, 132).

Alyssum campestre L. (Journ. Bot. 1935, 261).

Senecio Cineraria and its Distribution (Gard. Chron. 16 Nov. 1935, 352).

Epilobium adenocaulon Hausskn. in Britain (Journ. Bot. 1935, 177).

ASIA.

CHINA, JAPAN AND NORTHERN ASIA.—A number of important collections have been received during 1935, among which the following may be mentioned: 1400 specimens from Hainan collected on the 2nd and 3rd New York Botanical Garden Expeditions to that island, and another collection nearly as large from the Lingnan University. When it is possible to have these, and an equally large collection received after the close of 1935, mounted and laid in, the flora of this interesting area will be well represented in the Herbarium. Until recently the representation of the Hainan flora was meagre, except for the plants of Dr. Augustine Henry's collecting. A large collection from Shantung was received from the Arnold Arboretum, and 363 plants from the Loochoo Islands and Formosa were purchased from the collector, Mr. J. Linsley Gressitt. Some 260 specimens, obtained by the late Mr. George Forrest's native collectors, were received from the Royal Botanic Garden, Edinburgh, at the request of Lord Aberconway. Miss M. Whiting presented more than three hundred specimens from south China (Kwangtung) and Japan, and three further fascicles of *Flora Asiae Mediae* have been received from Taschkent. Dr. G. E. C. Herklots has sent an interesting collection of Hongkong Orchids, including several new records or rediscoveries of old species.

It has not been possible to proceed with the mounting of this material, but 2100 specimens from the stores were mounted during the first half of the year. The material of the genus *Meconopsis* has been arranged in the Herbarium by Dr. G. Taylor's monograph. Numerous type specimens have been sent on loan to monographers, particularly the genus *Begonia* to Prof. Irmscher, and the genus *Astragalus* to Prof. Handel-Mazzetti. As in former years many critical cultivated plants have been identified, the new species and varieties having been described. Towards the end of the year it was possible to resume work on a Revision of the Chinese species of *Gentiana* and this work will shortly be ready for publication.

Publication.—*Aconitum Nagarum* Stapf and *A. venatorium* Diels (Kew Bull. 1935, 579).

INDO-MALAYA.—The mounting and laying in of the accumulated arrears of Malay Archipelago and Philippine specimens continued, but owing to the large consignments received during the year there is no appreciable diminution in the quantity remaining to be dealt with.

The preparation of the final part of the "Flora of the Presidency of Madras" for various reasons took longer than expected. It was completed, however, before the close of the year and the proofs in part corrected. It consists mainly of the index for the whole work, but also contains an appendix of about 70 species, mostly described since the publication of the several parts.

The determination of the plants collected by the 1933 Mount Everest Expedition was completed early in the year. Two new species were described.

Dr. E. Barnes continued his botanical explorations of secluded areas in S. India and contributed a number of excellently prepared specimens as well as specimens in spirit and valuable notes. Four new species of *Arisaema* are included in his discoveries and these will be described and figured in "Hooker's Icones Plantarum" and in the Kew Bulletin in the near future.

Mr. T. D. R. Bell, C.I.E., late of the Indian Forest Service, presented 1500 specimens collected by himself and the late L. J. Sedgwick, I.C.S., in the Bombay Presidency. They have not yet been examined in detail but will form a valuable addition to the herbarium.

Another collection from the same region of about half the number was received through Lt.-Col. H. Cottingham, being the residue of the herbarium of the late W. A. Talbot, also of the Forest Service in Bombay.

Mr. H. A. C. Gill, I.C.S., sent a small collection made by him in Spiti in the Punjab hills. Although it contained no novelties, it is welcome as coming from an area little known botanically.

At the close of the year Mr. A. S. Vernay forwarded 132 specimens collected during his journey through Sikkim into Western Tibet. A preliminary examination has shown that the specimens have been well selected and prepared and will prove of very great interest.

A considerable number of duplicates were contributed by the Singapore Botanical Gardens, the Forest Research Institute of the Federated Malay States and the Buitenzorg Botanical Gardens (through Dr. H. J. Lam, Director of the Rijks Herbarium, Leiden).

Over 1000 specimens were consigned by the Forestry Department, British North Borneo and 100 by the Bureau of Science, Manila.

The naming of the collection made by the Oxford University Expedition to Sarawak in 1932 is now proceeding concurrently with

the identification of the large and valuable consignments received from the Forestry Department of British North Borneo. The bulk of the *Thalamiflorae* has now been dealt with, and a considerable quantity of duplicate material will have been distributed before this report is published.

Chaplain and Mrs. J. Clemens presented 149 specimens collected by them on Mount Kinabalu in British North Borneo and a further 2600 specimens were purchased.

Further collections from Siam were received from Mrs. D. J. Collins and Mr. H. B. Garrett.

The following smaller contributions were also made :

INDIA.—Punjab, by Mr. R. N. Parker ; Kashmir, by Mr. P. N. Kohli ; Assam, by Mrs. Lorrain-Foxall, Revd. W. J. L. Wenger, and the Botanical Forest Officer ; Burma, by the Maymyo Botanical Gardens (Orchids) ; Madras, by Mr. P. V. Mayaranathan (through the Madras Museum) ; various sources by the Imperial Forest Botanist, Dehra Dun.

CEYLON.—By the Director of Agriculture and the Ceylon Tea Institute (in connection with an enquiry concerning *Artemisia*).

PHILIPPINE ISLANDS.—By Miss M. M. Whiting.

Publications.—Studies in the Ericales : I. New and less-known species of *Agapetes* (K.B. 1935, 24). II. A new genus of *Vaccinioideae* from Borneo (K.B. 1935, 150).

The Flora of Madras : VIII.—Notes on the Flora of Madras : Part X. (K.B. 1935, 143).

New or little-known plants from S. India : V & VI (K.B. 1935, 92 and 157).

Some changes in plant names, by I. H. Burkill (K.B. 1935, 316).

Plants new to Assam : VII (K.B. 1935, 319).

Contributions to the Flora of Siam : XXXIX (K.B. 1935, 326).

Contributions to the Flora of Burma : XII (K.B. 1935, 572).

AFRICA.

An important event in this department was the completion of the "Flora of West Tropical Africa," the first part of which was published in March, 1927. The elaboration of the *Orchidaceae* and *Gramineae* took somewhat longer time than had been anticipated, but it was possible to despatch the first batch of MS. to the printers in the middle of August, and by the time this report is published the last Part will have appeared.* It contains the Monocotyledons, a Vegetation Map, and Index. It is anticipated also that

* Published on Feb. 20th, 1936.

the "Appendix," dealing with the economic plants of the area, will be available in a few months' time.

The staff have been mainly engaged in naming and laying in current material, and in the rearrangement of the herbarium, which is constantly required to facilitate the naming of new collections. A certain amount of revision has also been accomplished.

Revision work on *Acanthaceae*, *Leguminosae*, *Asclepiadaceae*, *Labiatae*, etc., has been continued, and the South African species of the genus *Cineraria* have been investigated and rearranged with a view to publication. Now that the "Flora of West Tropical Africa" has been completed, Dr. J. Hutchinson has commenced to work out the results of his visits to South Africa and Rhodesia in 1928-30, and as far as possible is comparing his material with type specimens, which should render more valuable the two sets left behind in South Africa, namely at Pretoria and at the Bolus Herbarium.

WEST TROPICAL AFRICA.—The number of specimens for determination from this area dropped considerably. From Portuguese Guinea, a little-known area, a number of Monocotyledons were received from the Jardim Colonial, Lisbon ; the Department of Agriculture, Sierra Leone presented over 100 specimens from the Gold Coast ; Dr. F. R. Irvine contributed over 300 specimens and Mr. C. Vigne contributed roughly 150, whilst a number of specimens were received from Mr. D. Gillett ; from Nigeria Messrs. J. D. Kennedy, R. Caterall, and G. C. R. Gray, and the Forestry Department contributed over 250 specimens. General collections were received from the Botanical Museum, Copenhagen (Coll. D. O. Hagerup), and from the Imperial Forestry Institute, Oxford.

CAMEROONS AND CONGO.—About 200 specimens were received in exchange from the Brussels Botanic Garden, and Mr. H. B. Johnston sent over 100 specimens for determination.

NORTH TROPICAL AFRICA.—Mr. W. B. K. Shaw sent a number of specimens collected by him on a further expedition to the Libyan Desert, which add several species to the list published in K.B. 1934, 284. Messrs. F. W. Andrews, E. E. Evans Pritchard and R. C. Maxwell Darling contributed over 200 specimens from the Sudan. From Goré, Western Abyssinia, Capt. E. N. Erskine sent a number of small specimens of the local flora ; these sufficed to show that a trained collector might make a rich contribution to botanical science from this area, since Capt. Erskine's collection contains an attractive species of *Impatiens* and a new *Begonia*. Major H. V. Godding sent a number of specimens from Somaliland. A short time was spent on the determination of the large consignments of Somaliland plants in hand—mainly the collection of the Ethiopian Boundary Commission—and this work should be completed early in 1936.

EAST TROPICAL AFRICA.—Good collections from this area are particularly welcome, in view of the projected preparation of the Flora of East Tropical Africa, as the acquisition by Kew of all such specimens will ensure their inclusion in the Flora. The following specimens have been received from this area during the year :—Uganda : from Mrs. D. R. Tweedie nearly 200 specimens collected on the south-western slopes of Mt. Elgon ; from the Forestry Department roughly 300 specimens, and about half this number from Mr. W. J. Eggeling (collected during a private expedition) ; from the Agricultural Department over 350 specimens, and a number of specimens from Mr. H. B. Johnston.

Kenya : from the Forestry and the Agricultural Departments nearly 200 specimens ; from Coryndon Memorial Museum nearly 450 specimens ; a number of specimens were also received from the Scott Agricultural Laboratories, and the Kenya Veterinary Research Laboratories.

Tanganyika : The most useful collection received was that made by Miss E. M. Bruce, B.Sc., who spent several months at Morogoro investigating the flora of the Uluguru Mountain. The result was a valuable collection of over 1000 specimens which has added many species, some of them new, to the herbarium. This collection is ample proof of the necessity for preliminary training at Kew for field work, of which Miss Bruce had wisely availed herself before going out. Her donation, and the set of 950 duplicates of Herr Schlieben's collection received in exchange from the Brussels herbarium, have therefore enriched our collections in time for inclusion in the proposed Flora of East Tropical Africa. In connection with Mr. P. R. O. Bally's work on medicinal plants, his collection was critically determined after preliminary examination by Mr. P. J. Greenway at Amani, and Mr. Bally has presented some specimens and photographs. The E. African Agricultural Research Station, Amani, has continued to forward specimens by various collectors, over 1000 being received for confirmation and determination. On his return from leave Mr. B. D. Burttt sent over 150 specimens on behalf of the Tsetse Research Station. Mr. A. H. Ritchie communicated a number of host plants of coffee-pests, the Department of Agriculture nearly 200 specimens, Mrs. Culwick about 60 specimens, Mr. J. H. Vaughan 30 specimens of Orchidaceae from Zanzibar and nearly 300 were received from Mr. A. P. G. Michelmores.

SOUTH TROPICAL AFRICA.—Over 1700 specimens have been received from Mr. H. Boyd Gilliland, about 400 from Mr. C. G. Trapnell, an equal number from Mr. F. Eyles, and about 200 from Mr. J. Gordon Read, whilst about 400 have been received from the Imperial Forestry Institute, Oxford, some of these being from Nyasaland. Our knowledge of the flora of the last mentioned country has not increased very much for many years, and good collections are much desired.

MASCARENE ISLANDS.—Nothing has been received during the year under review.

Publications.—The following papers were published during the year :—

Observations on the Genus *Commiphora* and its Distribution in Tanganyika Territory, by B. D. Burttt (K.B. 1935, 101).

African Orchids : VII (K.B. 1935, 195).

New Trees and Shrubs from Tropical Africa : IV, by A. C. Hoyle and H. Dunkley (K.B. 1935, 255).

Tropical African Plants : XIII (K.B. 1935, 271).

Notes on the Genus *Royena* Linn. (K.B. 1935, 286).

Material of *Marquesia acuminata* from Northern Rhodesia, by H. Bancroft (K.B. 1935, 559).

Coleus barbatus Benth. (K.B. 1935, 322, 590).

Hooker's *Icones Plantarum*, tt. 3265-3272, 3287-3293 (1935).

SOUTH AFRICA.

During the year the South African species of *Ximenia* and *Avenastrum* were examined by, and a collection of plants (700) from the Northern Transvaal was determined by Dr. H. G. Schweickerdt, the Botanist seconded by the Division of Plant Industry, Pretoria, for duty at Kew. His papers on *Ximenia* and on the Northern Transvaal collection are now ready for publication. Work was continued by Dr. Schweickerdt on South African *Gramineae* and on Schoenfelder and Bradfield's plants from South-West Africa. About 600 of these latter specimens were critically examined and named by him.

About 1300 specimens were received from the National Herbarium, Pretoria, mostly for verification. Of these, 400 specimens were gathered in South-West Africa by K. Dinter, E. Schoenfelder and R. Bradfield. The Natal Herbarium contributed a valuable collection of 1300 sheets gathered by the late H. J. Thode, one of the classical collectors of Natal. The Bolus Herbarium, Kirstenbosch, contributed about 150 specimens, mostly from the Cape Province. An extraordinary fine series of 500 Cape plants was donated by Paymaster-Captain T. M. Salter, R.N. ; and Dr. H. G. Fourcade also contributed a number of excellent sheets of Cape plants. Numerous miscellaneous South African specimens were received from the Imperial Forestry Institute, Oxford, and several specimens were received for naming from the McGregor Museum, Kimberley, from Mrs. H. A. Milford (collected in Basutoland), who also presented nearly 100 photographs, and from the Transvaal Museum, Pretoria. About 250 specimens were purchased from Mr. E. G. Bryant, Prieska Division.

Publications.—Notes on the Flora of Southern Africa : VI (K.B. 1935, 204).

A Revision of the Characters of Neodregea, by S. Garside (K.B. 1935, 292).

New and Noteworthy South African Plants : VII, by J. Burt Davy (K.B. 1935, 568).

AMERICA.

During the year roughly 8800 sheets were mounted and 4,600 sheets were incorporated in the Herbarium. Special attention has, as in previous years, been paid to the flora of British Guiana. A final consignment of undetermined sheets in the Jenman Herbarium was received from Georgetown early in the year, and has been dealt with. A small collection made by the Forest Department of the Colony has been identified, and also a set of the plants recently collected by the American botanist Dr. W. A. Archer and kindly presented by the Department of Agriculture. The latter collection was made mainly in the North-west District and consists largely of second-growth species. Mr. Tutin has nearly completed the identification of the collection made by him on the Cambridge University Expedition in 1933, carrying out the work mainly at Kew. An investigation of the British Guiana species of *Tovomita* has been undertaken, and an account will be published during 1936.

Throughout the year the staff has been occupied with the study of Mr. G. B. Hinton's remarkable collections from Central Mexico, and descriptions of new species have been prepared for the Kew Bulletin and for Hooker's *Icones Plantarum*. The scientific value of these collections is very high, since Mr. Hinton is willing to collect the same species again and again in all stages and degrees of development and variation.

Of other collections named during the year the most important is that of Mr. H. F. Comber, made on the Argentine Andes and in adjacent Chile in 1925-27. This had been put aside, after the identification of selected numbers, for some years, but has now been thoroughly studied and will be incorporated as soon as possible. It is hoped that several of the outstanding new species will be described in the near future. Miss D. B. Stafford's second Peruvian collection was named and incorporated, and a small collection from Baffin Land, made by the Rev. H. A. Turner, was also identified.

Among valuable collections in the store which have been incorporated during the year are those of Prof. M. E. Peck from British Honduras, and those of Mr. M. T. Dawe which were made in Colombia during the Great War. An interesting accession was the presentation of 1750 sheets, mainly of Tropical American plants, by the Jenman Herbarium, Georgetown. These sheets had been distributed as duplicates from Kew many years ago, but in view of

modern developments in phytogeography about half of them cannot now be treated as duplicates, and their return is therefore very welcome. Many hundreds of these sheets are specimens from the famous Glaziou collections in Brazil. A considerable amount of time was necessarily spent in checking the material in order to ascertain which specimens were required for the Herbarium.

The following collections were also received :—

NORTH AMERICA.—*Presented* : Canada, by Dr. D. Hooper on behalf of the Wellcome Historical Medical Museum (plants collected about 1825 on Sir W. S. Parry's 3rd voyage to the Arctic Regions) ; Mr. C. W. Thornton (Alaskan plants) ; Revd. & Mrs. H. A. Turner (Baffin Land plants) ; Miss M. Whiting (plants of Ontario, Quebec and British Columbia) ; United States, by the University of California, Berkeley (Californian plants) ; University of Florida Agricultural Experimental Station (numerous specimens of *Zephyranthes*) ; Mr. W. H. Pearsall (specimens of *Potamogeton* from the Herbarium of Walter Deane) ; Academy of Natural Sciences of Philadelphia (*Scrophulariaceae* of Eastern N. America) ; Dr. F. A. Rodway, Nowra, New South Wales (Californian plants coll. L. S. Rose) ; United States National Museum, Washington (plants of Arizona) ; United States and Canada, by the Dudley Herbarium, Stanford University (*Erythronium* of United States and British Columbia) ; Gray Herbarium (*Plantae Exsiccatae Grayanae*, Century V, and plants of Ontario and Michigan) ; Dr. S. F. Blake (plants of United States and Central America). *Purchased* : Mr. W. J. Eyerdam (plants of S. W. Alaska) ; Dr. F. W. Went (plants of Alaska and British Columbia).

CENTRAL AMERICA.—*Presented* : By Botanical Museum, Harvard University (Orchids of Honduras and Panama) ; Mr. C. L. Lundell (British Honduras plants) ; University of Michigan (plants of British Honduras, Guatemala and Mexico) ; Señor J. Gonzalez Ortega (Mexican plants). *Purchased* : Mr. C. L. Lundell (plants of British Honduras and Guatemala).

EAST TROPICAL SOUTH AMERICA.—*Presented* : By the British Guiana Forest Department (British Guiana plants) ; Instituto de Biologia Vegetal, Rio de Janeiro (Amazonian plants, coll. Dr. A. Ducke) ; Mr. J. G. Myers (British Guiana plants) ; Instituto de São Paulo (Brazilian *Verbenaceae*) ; Botanical Museum, Utrecht (Surinam plants). *Purchased* : New York Botanical Garden (Brazilian plants, coll. B. A. Krukoff).

WEST TROPICAL SOUTH AMERICA.—*Presented* : By Madrid Botanic Gardens (Colombian plants, coll. Dr. J. Cuatrecasas) ; Miss D. B. Stafford (Peruvian plants). *Purchased* : United States National Museum, Washington (Peruvian plants, coll. G. Klug).

TEMPERATE SOUTH AMERICA.—*Presented*: By Museo de Ciencias Naturales, Buenos Aires (Argentine *Verbenaceae*); Dr. A. Burkart (Argentine plants); Señor Cabrera (Argentine plants); United States National Museum, Washington (plants of S. America).

Publications.—Contributions to the Flora of Tropical America: XXIII and XXIV:—Notable Additions to the Flora of British Guiana (K.B. 1935, 117).

Review of the species of *Byrsonima* occurring in British Guiana (K.B. 1935, 311).

AUSTRALIA AND NEW ZEALAND.

Dr. W. E. Blackall has been working for several months on his very rich Western Australian collections and has kindly presented about a hundred specimens including portions of type specimens of species described by W. V. Fitzgerald, C. A. Gardner and others, as well as interesting gatherings of older species. These will fill many gaps in our collections. Dr. F. A. Rodway continued to send plants from New South Wales and we now have a fine collection from the southern part of that State. The specimens of *Juncus* have been especially investigated with interesting results. Other plants received included type specimens of species from Queensland and South Australia sent by Mr. C. T. White, Botanic Museum and Herbarium, Brisbane, and Dr. J. M. Black respectively. The naming of miscellaneous critical specimens and the answering of queries constituted the chief work carried out on Australian plants.

As the result of the voluntary assistance given by Miss M. D. Ker, it has been possible to prepare and send out a first instalment of duplicates from Mr. C. E. Hubbard's large Queensland collections.

Two valuable collections of New Zealand plants were received, one presented by the New York Botanical Garden (coll. A. W. Anderson) and the other by Miss L. M. Cranwell. The latter contained specimens from rarely visited islands and from mainland regions whose flora was poorly represented in the collections. Some specimens were also received from Dr. H. H. Allan. There has been no opportunity for work on New Zealand plants except routine determinations and replying to correspondence.

NEW GUINEA AND OCEANIA.

Mr. J. H. L. Waterhouse has continued to send specimens from the Mandated Territory, while the first instalments (amounting to roughly 1800 specimens) of plants obtained by Mr. C. E. Carr during a collecting trip into the interior of Papua have been received. These were presented by the Bentham-Moxon Trustees who contri-

buted towards the cost of Mr. Carr's expedition. The New York Botanical Garden presented a set of the *Ficus* specimens, collected during the Archbold Expedition, for critical determination.

The determination of plants collected by Mr. J. H. L. Waterhouse in the Solomon Islands (chiefly Bougainville I.) has been continued and a number of new species have been described. In this work Kew is keeping in close touch with Mr. C. T. White of Brisbane, who is having determined the large collections made in the same region by Messrs. L. J. Brass and S. F. Kajewski on behalf of the Arnold Arboretum. The species of *Ficus* of these latter collections have been received at Kew for determination.

Dr. A. C. Smith of the New York Botanical Garden spent several months at Kew working on his Fiji collections and during the same time the *Ficus* collected by him and others have been worked out and several new species discovered. These will be included in Dr. Smith's general account. A general account of the Figs of Fiji is being prepared. Further instalments of Fiji plants have also been presented by Mrs. H. B. R. Parham and Dr. A. Meebold.

Other collections received are Hawaiian plants purchased from Mr. O. Degener, and a large number presented in exchange by the Bernice P. Bishop Museum, Honolulu, who have also sent a fine collection of Samoan plants collected by Dr. E. Christophersen. The Field Museum, Chicago, presented a number of Hawaiian specimens collected by Mr. O. Degener, and Miss M. Whiting some specimens collected by her in Honolulu.

Among the numerous specimens received for identification have been some interesting plants collected in Tahiti, Raiatea and Rarotonga and sent by Capt. J. D. McComish.

Publication.—Melanesian Plants: I (K.B. 1935, 298).

GRAMINEAE.

During the year under review 8148 sheets of grasses have been incorporated in the herbarium. This number represents only a portion of the accumulation of material mounted in 1932-1934 and includes comparatively few of those mounted in 1935. About 2000 specimens were named during the past year, the larger number of which came from tropical Africa; on the other hand several thousand specimens from Australia, Siam, Mexico and Africa still await determination.

Large collections of grasses continue to be received from all parts of the world and have included a number of rare or new species. Those from Africa have been very numerous, especially from East Tropical and South Africa. Amongst other collections received, special mention may be made of the following: 70 specimens of *Saccharum* × *Sorghum* hybrids from Coimbatore Imperial

Sugarcane Station ; about 30 specimens of new species of Japanese Bamboos from Dr. Nakai, Tokyo Botanic Gardens ; over 50 Chinese grasses from Dr. Y. L. Keng, National Research Institute, Nanking, including co-types of several new species ; further collections of Queensland grasses from Mr. C. T. White, Botanic Museum and Herbarium, Brisbane and an exceptionally fine collection of about 350 sheets of Queensland *Panicaceae* from Mr. S. T. Blake, Brisbane ; also a number of specimens of wild and cultivated species of *Oryza* and *Sorghum* from the Department of Agriculture, Northern Nigeria, the Royal Botanic Gardens, Calcutta, Dr. O. Posthumus, and Dr. A. F. G. Kerr.

The preparation of the "Flora of Tropical Africa" has been continued, but on account of unforeseen difficulties encountered in the *Agrosteae* and increased routine work, part 1 of Vol. 10 has not yet been completed. For the "Flora of West Tropical Africa," a key to the genera of *Gramineae* and an account of the genus *Eragrostis* have been prepared. The study of Australian grasses has proceeded slowly and revisions of the Australian species of *Iseilema*, *Echinopogon*, *Zoisia* and *Heterachne* have been published in "Hooker's Icones Plantarum," together with a description of a new genus *Sclerandrium* and a key to the genera of the *Polliniastrae*.

A classification of the cultivated species of *Sorghum* by Mr. J. D. Snowden has appeared in the "Kew Bulletin" (K.B. 1935, 221). A comprehensive account by him of this important cereal will shortly be published. Mr. Snowden has also given valuable assistance in general routine work. Mr. W. R. Philipson, with the aid of a grant from the Department of Scientific and Industrial Research, has completed his study of the British species of *Agrostis*. During the autumn months the following botanists from other countries examined grasses in the herbarium : Dr. A. Eig, who kindly determined a large number of specimens in the genus *Aegilops* ; the late Professor A. S. Hitchcock and Professor L. R. Parodi were engaged for some weeks in studying the types of American grasses in the herbarium and both revised determinations wherever possible ; Dr. F. A. McClure spent several weeks in examining specimens of *Bambuseae* for his revision of the Chinese Bamboos, and Mr. R. N. Parker studied types and other specimens of Indian grasses in connection with his elaboration of the *Gramineae* for the Flora of the Upper Gangetic Plain.

Publications.—A Classification of the Cultivated Sorghums, by J. D. Snowden (K.B. 1935, 221).

Notes on African Grasses, XVIII (K.B. 1935, 306).

A Grass with Spiral Phyllotaxis—*Micraira subulifolia*, by W. R. Philipson (K.B. 1935, 324).

Hooker's Icones Plantarum, tt. 3261-64, 3280, 3283-3286.

Abnormal Spikelets in the Genus *Agrostis* Linn., by W. R. Philipson (Journ. Bot. 1935, 65).

The Development and Morphology of the Ligule in Grasses, by W. R. Philipson (New Phytol. 1935, 310).

The Development of the Spikelet in *Agrostis canina* L., by W. R. Philipson (New Phytol. 1935, 421).

PTERIDOPHYTA.

About 1100 sheets were incorporated during the year, while there still remain many hundreds more awaiting incorporation. These are sorted into genera and arranged in separate cabinets.

Two large new collections were received : (1) 800 sheets of Haiti ferns collected by E. L. Ekman and purchased from Dr. G. Samuelsson ; (2) 630 specimens of Jamaica ferns collected and presented by Lt.-Col. H. W. Russell. Several smaller collections were also presented, among which may be mentioned a set of specimens collected by Miss M. Steele in the Mishmi Hills, Assam. Mr. G. B. Hinton continues to send excellent material of Mexican ferns among his general collections.

Work on the fern flora of West Africa was continued somewhat intermittently. It was found impossible to finish the investigations in time for them to be included in the fourth part of the "Flora of West Tropical Africa" as had been originally intended. During the latter part of the year work was commenced on the preparation of a new "Handlist of Ferns and Fern Allies cultivated in the Royal Botanic Gardens, Kew."

MUSCI, HEPATICAE AND CHAROPHYTA.

On account of the pressure of more important work it has only been possible to mount and incorporate a limited number of collections in the stores. An important set of Polish mosses issued under the title "Bryotheca Polonica" has been received from the Academy of Sciences, Krakow, and Dr. F. Verdoorn's "Hepaticae Selectae et Criticae" Series 8 and "Musci Selecti et Critici" Series 2 have been purchased. Collections of mosses and hepatics have been received for identification from Australia, India, Fiji, Brazil and elsewhere.

Mr. G. O. Allen has kindly continued to co-operate in work on the *Charophyta*, and has presented two interesting collections from India and Great Britain respectively, the former including a number of species previously unrepresented in the Herbarium.

THALLOPHYTA.

ALGAE AND LICHENS.—Collections of algae added to the Herbarium during the past year included over 120 marine species from the Canary Islands, presented by Dr. F. Børgesen, in which are a

number of species first described in his "Marine Algae from the Canary Islands": a small set of fresh-water algae from S. Paulo, Brazil, collected by Dr. A. Löfgren and enumerated by O. Borge in Arkiv f. Bot. 1918, also presented by Dr. F. Børgesen: an interesting collection of marine algae from Mauritius, preserved in formalin, presented by Prof. T. A. Stephenson: a small set of marine algae from the West Indies, presented by Miss M. Glegg: some calcareous algae from South Africa presented by Dr. J. Muir; and also some British marine algae of historic interest among which are specimens collected by Miss Isabella Gifford, presented by Mr. F. Ballard. Professor W. A. Setchell of the University of California, who visited Kew in September, examined all the material of *Gigartina* and *Iridaea*, annotating many sheets.

The cutting-up, remounting and laying in of the "Phycotheca Boreali-Americana" has been continued and now more than half the volumes have been dealt with.

As in previous years a number of lichens from the general herbarium and from the Leighton collection have been loaned to lichenologists, especially in connection with the new edition of Rabenhorst's "Kryptogamen Flora." An exceptionally good collection of lichens of about 100 specimens from the second Regnell expedition to Brazil, determined by Dr. S. Malme, was presented by the Natural History Museum, Stockholm.

FUNGI.—The most important acquisition during the year was the mycological herbarium of the late Rev. P. G. M. Rhodes, which was bequeathed by him to Kew. This consists of approximately 5000 specimens, almost entirely microfungi, and contains, in addition to Father Rhodes' own British collections, numerous specimens sent to him in exchange by correspondents abroad. Early in the year some temporary assistance was available and with this help a large part of the collection has been incorporated.

Other important donations of named fungi were the following:—Australia: 32 specimens, including types of new species, of Sooty Moulds, etc., from Miss L. Fraser, University of Sydney. Canada: 56 specimens presented by the Central Experimental Farm, Canadian Department of Agriculture. Europe: 21 specimens from Prof. G. Samuelsson, Stockholm. Great Britain: 45 specimens, chiefly Pyrenomycetes, from Dr. J. Ehrlich. 50 specimens of Uredineae from Mr. E. A. Ellis. U.S.A.: 115 specimens of Californian fungi, presented by the University of California. Iowa Basidiomycetes, from the University of Iowa. 21 specimens of Septobasidium, including types, from Dr. J. Couch.

Fungi have been received for determination from Kenya (Mr. C. A. Thorold), Natal (Division of Plant Industry, Pretoria), U.S.A. (*Thelephoraceae*—Miss E. Morse), India (Mr. S. R. Bose) Tropical and South Africa (Dr. O. A. Höeg) and Australia (Dr. Ethel I. McLennan). The autumn fungus season in Britain was exceptionally

good, and, owing to the mild weather, was of long duration, so that work on the determination of fleshy fungi has been more than usually heavy. The work occasioned by varied queries from many sources, and requests for the examination of types has also been very considerable.

In preparation for the Sixth International Botanical Congress some considerable time was spent on nomenclature problems in the fungi.

Repair work on the herbarium sheets has necessarily been held up owing to the pressure of other work, but it is hoped to make progress with this during the winter months.

Visitors who have worked in the mycological department during the year include Dr. J. Ehrlich, who was preparing a monograph on the British species of *Nectria*, Professor A. H. R. Buller, Prof. N. J. G. Smith, Miss E. L. Stephens, Miss E. Fisher, Mr. T. Petch, Mr. W. B. Grove, and Mrs. E. T. Moldenke.

EXPERIMENTAL AND TRANSPLANT WORK.

Genetical research was continued at the Potterne Biological Station and at Kew on *Silene*, *Centaurea*, and *Saxifraga*. Scoring was commenced of F2 families derived from extra-British stocks of *Silene* and much of the future work will involve wild material from many European countries. Families (within *S. maritima* and *S. vulgaris*) from over 20 different countries have already been raised. Mr. E. M. Marsden Jones, Honorary Associate of the Royal Botanic Gardens, is continuing research at Potterne on *Anagallis* (with Prof. Weiss), on *Solanum Dulcamara*, and on *Epilobium*. Investigation of the microspecies of *Taraxacum* is continuing at Kew and preliminary experiments with *Clypeola* have been completed.

The Transplant Experiments of the British Ecological Society at Potterne have completed the eighth year of their existence. A third report has been published and the fourth biennial report is in progress of preparation.

Publications.—Third Report on the Transplant Experiments of the British Ecological Society at Potterne (Journ. Ecol. **23**, 443: 1935).

Further Experiments on sex in *Ranunculus acris* (Journ. Genetics **31**, 363: 1935).

Researches on *Silene maritima* and *S. vulgaris*: XIV and XV (K.B. 1935, 209).

The Investigation of Plant Species (Proc. Linn. Soc. London, 1934-35, 104).

The Genetics of *Anagallis arvensis* L. and *A. foemina* Mill. (l.c. 105).

BIOLOGICAL AND GENETICAL HERBARIA.

About 3500 sheets have been added to these collections during the year. These include: (1) additional material illustrating the ecological survey of Richmond Park; (2) further specimens connected with breeding work in *Silene*, *Centaurea*, *Taraxacum*, and other genera; (3) sets of specimens illustrating variation in *Calluna vulgaris* and *Solanum Dulcamara*.

SUMMARY.

The routine work, apart from naming, accomplished during 1935 is summarised as follows:—

Mounted	...	...	...	...	53,225 (approx.)
Incorporated	...	...	...	...	46,575 (approx.)
Duplicates distributed	...	...	...	...	10,332
Specimens received on loan	...	...	...	...	10,189
Specimens sent on loan	...	...	...	...	6,798
Specimens presented or purchased	...	...	...	...	75,896

ILLUSTRATIONS AND PORTRAITS.

The new studio and dark-room, Jodrell Laboratory, have been in use this year and the increased space and convenience are proving a great boon. A good deal of work had unavoidably been held up during the construction of the building but has now been dealt with, and work in the department is now much more up to date.

An enlarger has been purchased, but full advantage of the new facilities will only be appreciable when the equipment is more extensive.

A number of type specimens borrowed from other Herbaria have been photographed for the Kew collection, and about 500 herbarium specimens, living specimens and drawings, have been photographed for other Institutions. Drawings in colour and in black and white have been made for various publications.

Miss M. W. Tanner of London has again worked at the studio on botanical drawings, and Miss S. Atteck, from the Department of Agriculture, Trinidad, studied botanical drawing for several months at the Herbarium and also at the studio.

Drawings and photographs received during the year and incorporated in the Collection included:—52 water-colour drawings prepared for the Botanical Magazine and presented by the Royal Horticultural Society; 76 original drawings for a Supplement to Elwes' Monograph of the Genus *Lilium*, presented by Miss Snelling, and 40 plates of the Flowering Plants of South Africa by Dr. Pole Evans. The Bentham-Moxon Trustees continued their presentation

of copies of Hooker's *Icones Plantarum*, and numerous photographs and pictures were received from the collections of the late Dr. N. E. Brown and Mr. J. Fraser. Dr. A. A. Pulle presented 35 plates from Dr. H. J. Lam's work on the Sapotaceae; plates of *Dioscorea*, to appear in the *Annals of the Royal Botanic Garden, Calcutta*, were received from Mr. I. H. Burkill, and two photographs of the rare orchid, *Cephalanthera rubra*, showing it growing in its only British county, from Mr. W. R. Price. Numerous drawings from other sources were also incorporated in the collection.

Nearly 200 photographs of type-specimens received from the New York Botanic Garden were laid into the Herbarium, placed in envelopes mounted on Herbarium sheets.

Mr. H. N. Ridley has presented portraits of Sir Joseph Banks and F. von Mueller, and a very fine portrait of Dr. J. Forbes Royle was presented by Miss Forbes Royle. Other portraits added to the collection during 1935 include those of Thomas Cooper, John Fraser and A. B. Jackson.

NOMENCLATURE.

The Nomenclature work during the year was greatly increased by preparations for the Sixth International Botanical Congress. From the Royal Botanic Gardens, Kew, fifteen separate proposals dealing with additions and amendments to the International Rules of Botanical Nomenclature were submitted by members of the staff.

An important paper dealing with the conservation of later generic homonyms by Professor A. Rehder (Arnold Arboretum), Mr. C. A. Weatherby (Gray Herbarium), Dr. R. Mansfeld (Berlin), and Miss M. L. Green (Kew), was published, and laid before the Amsterdam Congress. The preparation of this paper was necessary owing to the alteration made in the homonym rule at the Cambridge Congress whereby all later homonyms are rejected. The conservation of a large number of later generic homonyms will save much nomenclatural change. The paper has been submitted to the appropriate Nomenclature Committee appointed at Amsterdam.

In his capacity as Rapporteur général Dr. T. A. Sprague issued his "Synopsis of Proposals" (see below). In this work all the proposals received by him were set forth in order. In all cases the new proposal is preceded by the text of the corresponding rule in the "International Rules of Botanical Nomenclature, ed. 3." Two copies of the Synopsis were sent to each of the members of the Executive Committee and certain other botanists, fourteen in all, in order to obtain their comments and votes on all the proposals contained in the Synopsis. The replies received were incorporated in "Preliminary Opinions concerning Nomenclature Proposals," also issued by Dr. Sprague.

As "Secretary for English" Miss M. L. Green prepared a full report of the Nomenclature Proceedings in that language at Amsterdam, and this, together with the German and French reports, formed the basis of the Report, prepared by Dr. Sprague as Secretary of the Executive Committee of Nomenclature, published in the Proceedings of the Congress.

The number of enquiries from botanists and others concerning nomenclatural difficulties has been, as usual, very large, and in order to reply adequately to many of them, much technical research is needed.

A new edition of the "Handlist of Coniferae grown in the Royal Botanic Gardens, Kew" is being prepared, and all the names contained in it are being investigated.

Publications.—Additions and Amendments to the International Rules of Botanical Nomenclature (K.B. 1935, 65-92).

Some changes in Plant Names (K.B. 1935, 316-319).

Conservation of later generic homonyms (K.B. 1935, 341-544).

The Gender of Generic Names: A vindication of Art. 72 (2) (K.B. 1935, 545-557).

The valid publication of the combination *Lilium Duchartrei* var. *Farreri* (K.B. 1935, 578-579).

Synopsis of Proposals concerning Nomenclature submitted to the Sixth International Botanical Congress, Amsterdam, 1935 (8vo., 80 pages).

Preliminary opinions concerning Nomenclature Proposals submitted to the Sixth International Botanical Congress, Amsterdam, 1935 (8vo., 28 pages).

Nomenclature at the Sixth International Botanical Congress, Amsterdam, September 2-7 (1935) (Gard. Chron. ser. 3. 98, 425-427: 1935).

INDEX KEWENSIS.

The compilation of Supplement IX has gone on steadily throughout the year, the number of entries in the card catalogue amounting at the present time to about 29,000. The cards are arranged alphabetically, and are available for consultation by members of the staff and visiting botanists.

A large number of names omitted from the original Index and the Supplements has been included in the current supplement, such as those extracted from the seven volumes of *Colla, Herbarium Pedemontanum* (1833-1837).

The compilers have been engaged chiefly on extracting names from periodicals, but a good commencement has also been made on the independent works published during the quinquennium. It is worthy of mention also that during this same period a large number of new periodicals containing new names has appeared. There has also been a considerable increase in the amount of Russian literature received.

VISITORS.

The number of signatures in the Visitors' Book for the year 1935 was 5605.

The following gave voluntary assistance:—Miss M. M. Whiting again assisted in arranging and classifying the Indo-Malayan material and Miss D. A. Chaytor and Mr. R. A. Blakelock gave similar assistance in the European section; Miss M. D. Ker continued the work she undertook last year of labelling collections of Australian plants; Mrs. E. Milne-Redhead gave further help in preparing drawings in connection with articles appearing in the Kew Bulletin; Mr. J. D. Snowden assisted in the work on the Gramineae and Miss M. Gossling helped in sorting and laying in specimens in the Mycological Department.

Amongst frequent or regular visitors were members of the staffs of the Department of Botany, British Museum, the Imperial Mycological Institute, and the Imperial Forestry Institute, Oxford. The Staff employed by the Royal Horticultural Society in connection with the preparation of the Index Londinensis and the Botanical Magazine have worked in the Herbarium and Library throughout the year.

The most noteworthy or frequent visitors to the Herbarium were the following:—

Mr. A. H. G. Alston; Dr. E. K. Janaki Ammal (Calcutta); Major G. Aylmer (Sudan).

Mr. E. G. Baker; Miss E. M. Barnes; Miss E. C. Barnett (Aberdeen); Mr. W. F. Bean; Dr. W. Bircher (Switzerland); Dr. W. E. Blackall (Cottesloe, W. Australia); Mrs. L. Bolus (Kirstenbosch, S. Africa); Mr. L. A. Boodle; Miss E. M. Bruce; Miss E. Brubaker (Philadelphia); Mr. I. H. Burkill; Prof. A. H. R. Buller (Winnipeg); Dr. E. J. Butler.

Mr. K. St. G. Cartwright; Miss M. E. S. Chandler; Miss D. A. Chaytor; Mr. S. Clay; Prof. R. H. Compton (Kirstenbosch, S. Africa); Dr. Erling Christopherson (Oslo); Miss L. M. Cranwell (New Zealand); Madame H. Czechtz (Cracow).

Dr. J. M. Dalziel; Mr. J. E. Dandy; Mr. H. N. Dixon; Mr. H. Dunkley.

Miss Alice Eastwood (San Francisco, California); Dr. J. Ehrlich (late of New York); Dr. A. Eig (Jerusalem); Mr. A. W. Exell.

Dr. H. R. Fletcher.

Miss M. Gossling; Dr. W. Balfour Gourlay; Mr. A. D. Grant (Aberdeen); Mr. P. J. Greenway (Amani, Tanganyika Territory); Col. C. H. Grey; Mr. W. B. Grove.

Mr. M. Hassib (Cairo); the late Dr. A. S. Hitchcock (Washington); Mr. J. H. Holland; Dr. D. Hooper; Mr. J. T. Howell (San Francisco, California); Mr. A. C. Hoyle.

Miss J. B. Imlay; Dr. F. R. Irvine (Accra, Gold Coast).

Mr. A. Bruce Jackson; Dr. W. L. Jepson (Berkeley, California).
Miss M. C. Karsten (Terborg, Holland); Miss M. D. Ker;
Dr. A. F. G. Kerr.

Mr. J. E. Lousley.

Dr. F. A. McClure (Lingnan University, Canton); Miss H. N. McKay (Johannesburg); Dr. I. Manton; Mr. E. W. Mason;
Dr. A. Meebold (Munich); Mrs. E. Milne-Redhead; Dr. H. N. Moldenke (New York); Mrs. Ellys T. Moldenke (New York);
Mr. H. N. Montford; Mr. B. O. Mulligan; Dr. John Muir (Riversdale, S. Africa).

Miss E. R. Napier (Nairobi, Kenya Colony); Dr. R. Nordhagen (Bergen); Mr. C. Norman.

Mr. R. N. Parker (Lahore); Dr. Lorenzo R. Parodi (Buenos Aires); Mr. T. Petch; Mr. W. R. Philipson; Mr. W. R. Price;
Mr. H. W. Pugsley.

Prof. A. Rehder (Arnold Arboretum, Jamaica Plain); Mrs. E. M. Reid; Mr. H. N. Ridley; Dr. Guy Roberty (French Sudan).

Dr. B. Sahni (Lucknow); Mrs. C. I. Sandwith; Mr. Gunnar Seidenfaden (Copenhagen); Prof. W. A. Setchell (Berkeley, California); Dr. A. C. Smith (New York); Dr. N. J. G. Smith (Grahamstown, S. Africa); Miss L. Snelling; Mr. J. D. Snowden; Miss M. S. Sprague; Mr. F. L. Squibbs (Seychelles); Miss D. B. Stafford;
Mr. W. T. Stearn; Miss E. L. Stephens (Cape Town); Mr. Neil E. Stevens (Washington, D.C.).

Mrs. V. L. Täckholm (Stockholm); Mr. T. Tang (Peking);
Dr. G. Taylor; Mr. C. G. Trapnell (Mazabuka, Northern Rhodesia);
Mr. A. W. Trethewy; Mr. T. G. Tutin.

Mr. J. E. Vanderplank (Pretoria); Dr. Fr. Verdoorn (Leiden).

Mr. F. T. Wang (Peking); Mr. E. F. Warburg; Mrs. Wedgwood;
Miss M. M. Whiting; Mr. T. Lloyd Williams (Accra, Gold Coast);
Dr. J. C. Willis; Dr. S. P. Wiltshire; Col. A. H. Wolley Dod;
Mr. W. C. Worsdell.

Dr. Y. Yamamoto (Taihoku, Formosa).

DISTRIBUTION OF DUPLICATES.

The following were the principal institutions to which duplicates were distributed:—

Great Britain.—British Museum (Natural History).

Europe and Orient.—Berlin, Botanic Gardens and Museum;
Brussels, Botanic Garden; Florence, Botanical Institute; Giessen, Botanical Institute; Helsingfors, Botanical Museum; Leiden, 's Rijks Herbarium; Madrid, Botanic Garden; Paris, Natural History Museum; Sofia, University, Department of Botany; Stockholm, Botanical Museum; Tartu, Botanical Museum and Herbarium; Uppsala, Botanical Institution; Utrecht, Botanical Museum and Herbarium; Wijster, Biological Station.

Asia.—Canton, Lingnan University; Nanking, National Research Institute of Biology; Manila, Bureau of Science.

Africa.—Pretoria, Division of Plant Industry.

America.—Buenos Aires, Botanical Laboratory of the Faculty of Agriculture; Berkeley, University of California; Chicago Field Museum of Natural History; Harvard University, Arnold Arboretum, Botanical Museum and the Gray Herbarium; New York, Botanical Garden; Philadelphia, Academy of Natural Sciences; Washington, D.C., United States Department of Agriculture, Bureau of Plant Industry and the United States National Museum.

Australia.—Brisbane, Botanic Museum and Herbarium; Melbourne, Botanic Gardens; Perth, State Herbarium.

The Library

The work of the Library has been carried on under difficulties owing to the shortage in staff mentioned in K.B. App. 1934, 42. Consequently it has not been possible to complete the new press-marking necessitated by the re-arrangement of the books on a subject basis, although some progress has been made in this direction.

The cataloguing of current literature is being kept up to date, but it has not been possible to deal with the very large arrears which had accumulated during and since the War, and a considerable quantity of literature is thus virtually unavailable for reference.

Important lacunae in the collection of standard floras and of anatomical and economic works have been filled by the purchase of books offered in second-hand catalogues. The card-index of desiderata started in 1934 has proved invaluable in this connection.

During the year 405 books were bound, rebound or repaired.

The Bentham-Moxon Trustees have presented the following works during 1935: Bonnier, G., *Flore complète de France Suisse et Belgique, Table générale*, Paris, 1934, the concluding volume of this useful illustrated work. Chomel, P. J. B., *Catalogus plantarum officinalium*, Parisiis, 1730, consists of a list of officinal plants classified according to therapeutic properties under the names given in Caspar Bauhin's *Pinax* or Jean Bauhin's *Historia*, with synonyms from the sixteenth-century herbalists. Deville, N., *Histoire des plantes de l'Europe*, Lyon, 1737, has descriptions and accounts of the medicinal properties of European plants, arranged according to Caspar Bauhin's *Pinax*. *Gerard's Herball: The Essence thereof distilled by M. Woodward*, London, 1927, is an abridgement of Johnson's edition of 1636. Guilandinus, M., *Papyrus*, is the first edition of a commentary on the three chapters on papyrus in Pliny's *Natural History*. Hunger, F. W. T., *The herbal of Pseudo-Apuleius*, Leyden, 1935, contains reproductions of the ninth-century manuscript in the

abbey of Monte Cassino and the first printed edition of Joh. Phil. de Lignamine. Illiger, J. K. W., *Versuch einer systematischen vollständigen Terminologie*, Helmstädt, 1800, is useful as a guide to technical terms used at that date. The Kew set of Mattioli's works has been enriched by the acquisition of his *Opusculum de Simplicium medicamentorum facultatibus*, Lugduni, 1571. Rolfinck, W., *Liber de purgantibus vegetabilibus*, Jena, 1667, though primarily pharmaceutical, includes short descriptions of various plants and drugs, and a learned account of Colocynth. Rondelet's *Dispensatorium*, Cologne, 1565, is bound together with Curio, J., *Conservandae bonae valetudinis praecepta*, Lugduni, 1577, a work of the Salerno school. Sethus, S., *Syntagma de cibariorum facultate*, Basileae, 1538, contains Greek and Latin texts of this work on dietetics, which was consulted by Fuchs in the preparation of his *Historia* (1542). Tallat, J., *Artzney Biechleinn der kreutter*, Augsburg, 1530, was evidently a very popular work in the early sixteenth century since 12 editions were published at five different German towns during the period 1497-1532. According to Haller, *Bibl. Bot.* 1. 244 (1771) and Pritzel, *Thes.* ed. 2, 319 (1872) the author's real name was Tollat; the copy presented by the Trustees represents an unrecorded edition.

Mr. Henry Fraser very kindly gave Kew a number of the books which belonged to his brother, the late John Frazer, V.M.H. These included:—N. J. Andersson, *Monographia Salicum*; J. G. Baker, *Handbook of the Amaryllideae* and *Handbook of the Irideae*; J. E. Smith, *Flora britannica*; and E. Step, *Wayside and woodland ferns*.

Lieut.-Col. Sir David Prain has continued to send various publications, including the current issues of several important periodicals.

The Royal Horticultural Society has presented its *Lily Year Book* (no. 4), and the Rhododendron Association its *Year Book*, with *Supplement*, each for 1935.

The New York Botanical Garden have continued to send, among other publications, *Brittonia*, the *North American Flora*, and two copies of *Addisonia*.

Volume 3 of the Flora U.R.S.S. has come, in continuation, from the Botanical Institute of the Academy of Sciences, Leningrad.

The Crown Agents for the Colonies have presented, among other publications, several reports of the Land Development Survey, Tanganyika Territory.

The British Museum (Natural History) have very kindly sent proofs of P—S of their supplementary catalogue, and the London School of Hygiene and Tropical Medicine part 2 of their classified catalogue.

The following books have been sent to Kew by their publishers for review in the Bulletin: Editor, *American Midland Naturalist*:—P. Weatherwax, *The phylogeny of Zea Mays*; Messrs. Edward Arnold & Co.:—C. Elliott, *Rock garden plants*, C. E. Marshall, *Colloids in agriculture*; Conservator of Forests, Assam:—U. N. Kanjilal,

P. C. Kanjilal, and A. Das, *Flora of Assam*, vol. i, pt. I; Country Life:—H. D. Woodcock, and J. Coutts, *Lilies, their culture and management*; Imperial Bureau of Soil Science:—*Bibliography of soil science, fertilizers and general agronomy*, 1931-34; Messrs. Macmillan & Co.:—W. C. Muenscher, *Weeds*, Edith A. Roberts, and Julia R. Lawrence, *American ferns*, The Lady Rockley, *Wild flowers of the great dominions of the British Empire*, G. A. Stevens, *Garden flowers in colour*, C. W. Wardlaw, *Diseases of the banana and of the Manila hemp plant*; Melbourne Botanic Gardens:—A. J. Ewart, *Flora of Victoria*; Messrs. Metcalf & Cooper:—G. O. Case, *British Guiana timbers*; Natal University College:—J. S. Henkel, *A field book of the woody plants of Natal and Zululand*; National Museum of Wales:—H. A. Hyde, *Welsh timber trees*, ed. 2; Pharmaceutical Press:—Martindale & Westcott, *The extra pharmacopoeia*, vol. 2, ed. 20; Messrs. Putnam:—L. N. Sutton, *The cool greenhouse*; Messrs. L. Reeve & Co.:—A. M. Ayre, *Wild flowers of Newfoundland*, pt. 3; University of Minnesota Press:—Josephine E. Tilden, *The algae and their life relations*.

The Editor of Nature has presented to Kew the following books, some of which have been reviewed by members of the staff: E. A. Bessey, *A text-book of mycology*; D. Bois, *Les plantes alimentaires chez tous les peuples*, etc., vol. 3; J. J. Burgess, *The flora of Moray*; I. H. Burkill, *A dictionary of the economic products of the Malay Peninsula*, 2 vols.; W. G. Craib, *Flora siamensis enumeratio*, etc. vol. 2, pt. 2; H. Dunkin, *The pruning of hardy fruit trees*; C. E. C. Fischer, *Flora of the Presidency of Madras*, pt. 10; A. Frey-Wyssling, *Die Stoffauscheidung der Höheren Pflanzen*; J. Grainger, *Garden science*; M. O. Johnson, *The pineapple*; F. Marie-Victorin, *Flore laurentienne*; W. C. Muenscher, *Weeds*; J. H. Salter, *The flowering plants and ferns of Cardiganshire*; K. M. Smith, *Plant viruses*; Mary Stout, *Gardening for Egypt and allied climates*; *Veröffentlichungen des Geobotanischen Institutes Rübel in Zürich*, 11 Heft.

Among the more important independent works received are the following; presented by the authors unless otherwise stated: A. Agostinii, *Un codice Veneziano del 1600*; L. H. Bailey, *Gentes herbarum*, vol. 3, fasc. 6; R. W. Bond & C. Barrett, *Victorian ferns: descriptions of all the species occurring in the States*; Botanical Congress, Vienna, 1905, *Propositions de changements aux lois de la nomenclature botanique de 1867 dont l'adoption est recommandée au Congrès international de nomenclature botanique projeté à Vienne en 1905* (from Mr. I. H. Burkill); *Fungi exsiccati Succici, praesertim Upsaliensis*, 1-2 (from Botaniska Institutionen, Uppsala); G. A. Boulenger, *Revision des Roses d'Asie de la section des Eglanteriae, groupes des Pimpinelli—Suavifoliae, Orientales et Alpinae Vestitae*; F. O. Bower, *Primitive land plants* (on permanent loan from Ministry of Agriculture); Louise A. Boyd, *The Fiord region of East Greenland*; R. Bracher, *Field studies in ecology*; C. E. B. Bremekamp, *A monograph of the genus Pavetta, L.*; H. R. Britton-Jones, *The diseases and*

curing of cacao (on permanent loan from Ministry of Agriculture); B. Bunting, C. D. V. Georgi, and J. N. Milsum, *The oil palm in Malaya* (from the Director, Department of Agriculture, Kuala Lumpur, F.M.S.); I. H. Burkill, *A dictionary of the economic products of the Malay Peninsula*, 2 vols. (from the Crown Agents for the Colonies, on behalf of the Governments of F.M.S. and S.S.); A. C. Celsus, *Demedicina libri octo* 1665 (from Mr. H. N. Ridley); P. D. Chien Pei, *The Verbenaceae of China*; H. Correvon, *Les orchidées rustiques*, 1893 (from Miss Elwes); H. Correvon, *La culture des plantes alpines dans le sphagnum* (from Miss Elwes); J. Costantin, *Aperçu historique des progrès de la botanique depuis cent ans* (1834-1934); A. Dickinson, *Les espèces survivantes tertiaires du Bas-Languedoc*; B. A. Fedchenko and others (Editors), *Flora Turkmenii* (from the Academy of Sciences, Leningrad); P. Font Quer, *Schedae ad Floram Ibericam Selectam*, Cent. 1; H. E. Forrest, *The Atlantean Continent*, 1933; J. S. Gamble, *Flora of the Presidency of Madras*. Part 10 (from the Secretary of State for India); B. Grant, *Note-book and catalogue* on which Major Bartle Grant's work on the Orchids of Burma was based (from Mrs. B. Grant); D. H. Hoppe, *Caricologia germanica oder Aufzählung der in Deutschland wildwachsenden Riedgräser*, 1826 (from Mr. H. N. Ridley); Isobel W. Hutchison, *North to the rime-ringed sun*; H. H. Janssonius, *Mikrographie des Holzes*, Lief 12; R. Jørgensen, *Karplantenes hoidegrener i Jotunheimen* (from Mr. J. M. Kindersley); S. Junell, *Zur Gynäceummorphologie und Systematik der Verbenaceen und Labiateen*; S. N. Kapur, *A Manual on the air seasoning of Indian timbers*, 2 copies (from the Manager of Publications, Delhi); S. L. Kessel, *Report on the indigenous forests . . . of New South Wales* (from Mr. C. E. C. Fischer); A. F. G. Kerr, *Reports of Botanical Tours in Siam*; K. Krause, *Zur Flora von Ankara*, Heft 2; J. Lebrun, *Les Essences Forestières du Congo Belge*, 2: *Les Essences Forestières des régions montagneuses du Congo oriental*; A. Lemée, *Dictionnaire . . . des genres de plantes phanérogames*, vol. 6 (conclusion); C. Linné, *Oländska Resa* (from Miss M. L. Green); C. Linné, *Centuria 2 Plantarum*, 1756, photostat copy (from Prof. E. D. Merrill); C. L. Lundell, *Preliminary sketch of the phytogeography of the Yucatan Peninsula*; F. Marie-Victorin, *Flore Laurentienne*; M. M. Martinez, *Aportaciones a la flora española plantas de Alicante*; G. Masamune, *Floristic and geobotanical studies on the Island of Yakusima, Province Osumi*; E. D. Merrill, *A commentary on Loureiro's "Flora Cochinchinensis"* (from the Secretary of the American Philosophical Society); P. A. Munz, *A manual of Southern Californian botany*; T. Nakai and M. Kitagawa, *Plantae novae Jeholenses* 1 (from the Office of the Scientific Expedition to Manchoukuo, Waseda University, Tokyo); T. Nakai, M. Honda, and M. Kitagawa, *Contributio ad cognitionem florum Manchuricae* (from the Office of the Scientific Expedition to Manchoukuo, Waseda University, Tokyo); Dorothy Norris, P. M. Glover, and R. W. Aldis, *Lac and the Indian Lac Research Institute* (from the Director,

Indian Lac Research Institute); W. R. B. Oliver, *The genus Coprosma*; F. W. Pennell, *The Scrophulariaceae of Eastern Temperate North America*; J. W. Pont, *Physiological studies with seeds of Andropogon Sorghum Bort.* (from the Botanical Laboratory, Rijks Universiteit, Utrecht); *Report of the British Association for the Advancement of Science*, 1934 (from Miss Wakefield); *Report of the Kenya Lands Commission* (from Mr. H. Sampson); H. Resvoll-Holmsen, *Svalbards Flora, with an English translation* (in typescript) by Miss May Rathbone (from Miss Rathbone); E. J. Salisbury, *The living garden*; H. Sargeant, *Flowering trees and shrubs* (from Dr. F. A. Rodway); E. E. Sherff, *Revision of Tetramolopium, Lipochoeta, Dubautia and Railliardia*; M. Skene, *A flower book for the pocket*; J. E. Spingarn, *The large flowered Clematis hybrids*; T. A. Sprague, *Synopsis of proposals concerning nomenclature submitted to the Sixth International Botanical Congress, Amsterdam*, 1935; C. G. G. J. van Steenis, *On the origin of the Malaysian mountain flora*, part 1; N. Stojanoff and B. Achtaff, *Studien über die Centaureen Bulgariens* (from Dr. W. B. Turrill); N. Stojanoff and B. Achtaff, *Über den Begriff und die systematische Stellung von Centaurea affinis Friv. und Centaurea pallida Friv.* (from Dr. W. B. Turrill); N. Stojanoff and B. Achtaff, *Kritische studien über die Nelken Bulgariens* (from Dr. W. B. Turrill); C. P. G. Wade, *Mechanical cultivation in India* (from the Imperial Council of Agricultural Research, Delhi); Mary V. Walcott, *Illustrations of North American pitcherplants* (from Sir Henry Wellcome); F. B. W. White, *The flora of Perthshire* (from Mrs. Wedgewood); R. O. Williams, *Flora of Trinidad and Tobago*, vol. 1, part 6 (from the Director, Department of Agriculture, Trinidad); E. V. Wulff and V. L. Nilov (Editors), *Essential oil plants: their cultivation and essential oils*, vol. 1. (from the Library of the Institute of Plant Industry, Leningrad).

In addition to the continuation of most of the periodicals and serial publications recorded in previous Reviews, the following have been presented by the editors, societies or institutions issuing them, unless otherwise stated:—*Agricultural Journal of British Guiana*, vol. 5, no. 4, and vol. 5, nos. 1-3; *Apensos ao Recenseamento Agricola de 1929-1930* (Direcção dos Serviços de Agricultura da Colonia de Moçambique); *Arquivos do Instituto de Biologia Vegetal, Rio de Janeiro*, vol. 1, nos. 2-3, and vol. 2, no. 1; *Black Rock Forest Bulletin*, no. 5; *Boletín de la Sociedad Española de Historia Natural*, vol. 34, nos. 8-10, and vol. 35, nos. 1-9; *Brooklyn Botanic Garden Leaflets* (52 numbers); *Bulletin du Jardin Botanique de Buitenzorg*, Sér. 3, vol. 13, livr. 2, and *Supplément*, vol. 2, livr. 3-4; *Bulletin of Medicinal and Aromatical Plants*, vol. 1 (Director, Krasnaja Jorva Dutshiliskaaja 2, Simpheropol, Nilar, Crimea); *Bulletin of Medicinal and Technical Plants*, vol. 3 (All Union Scientific Research Institute for Medicinal Plants, Moscow district, U.S.S.R.); *East African Agricultural Journal of Kenya, Tanganyika, Uganda and Zanzibar*, vol. 1, nos. 1-3; *Euphorbia Review*, vol. 1, nos. 1-2; *Forest Products*

Research Records, nos. 1-5 (Department of Scientific and Industrial Research); *Iconographia Plantarum Asiae Orientalis*, vol. 1, no. 1; *Journal of the Australian Institute of Agricultural Science*, vol. 1, nos. 1-3; *Journal of the British Honduras Agricultural Society*, vol. 1, nos. 1-4; *Journal of South African Botany*, vol. 1, pts. 1-4 (from the Director, National Botanic Gardens, Kirstenbosch, Newlands, Near Cape Town, S. Africa); *London Naturalist for the year 1934*; *Madroño*, vol. 3, no. 2; *Malayan Forester*, vol. 4, pts. 1-4; *Mededeeling van het Botanisch Laboratorium der Rijks-Universiteits te Utrecht*, nos. 1-3; *Proceedings of the 9th and 10th Annual Meetings of the National Shade Tree Conference* (from the Secretary-Treasurer, National Shade Tree Conference, New Jersey, U.S.A.); *Proceedings of the Birmingham Natural History and Philosophical Society*, vol. 16, no. 5, including *List of members and Annual Report for 1933*; *Revista Argentina de Agronomía*, tomo 1, nos. 1-4, and tomo 2, nos. 5-6; *Rodriguesia*; *Revista do Instituto de Biologia Vegetal, Jardim Botânico e Estação Biológica do Itatiaia*, anno 1, nos. 1-2; *Scientific Papers of the Institute of Algological Research, Hokkaido Imperial University Sapporo*, vol. 1, no. 1; *Symposia commemorating six decades of the modern era in botanical science*, vol. 1, nos. 1-3 (from the Department of Botany, Iowa State College, Ames, Iowa, U.S.A.); *Travaux de l'Institut de la Systématique des Plantes et du Jardin Botanique de l'Université de Wilno*, nos. 4-6.

The Imperial Agricultural Bureaux, and various agricultural, botanical, and forestry departments and institutions in this country, in the overseas Empire, and in other countries, have continued to send their publications to Kew.

Numerous contributors to botanical periodicals have kindly sent their reprints to add to the large and increasingly useful collection at Kew.

The Ordnance Survey Office, Southampton, and the War Office have kindly continued to send maps as they are issued.

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