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HANDBOOK OF THE AMARYLLIDEÆ.

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HANDBOOK  
OF  
THE AMARYLLIDÆ,

INCLUDING THE  
ALSTRÆMERIÆ AND AGAVEÆ.

BY  
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## PREFACE.

DURING the twenty-three years I have been at Kew I have made notes on the characters of all the *Amaryllideæ* that have passed through my hands in a living state, and have had the opportunity of examining dried specimens of nearly all the species of the order. I have attempted in the present work to furnish cultivators and botanists with a compact working handbook, of which the main part consists of characters of the genera and species drawn up from actual specimens. I have not attempted to deal fully with the bibliography of the plants, or to trace out their pre-Linnean history, or to say anything about their cultivation, or to deal, except very briefly, with the garden hybrids, which are so numerous in this order. For fuller information on these points I would refer those who wish for it to Parkinson's 'Paradisus,' Kunth's 'Enumeratio,' Bentham & Hooker's 'Genera Plantarum,' Herbert's 'Amaryllidaceæ' and his other writings, and the papers by Colonel Trevor Clarke in the 'Gardeners' Chronicle' for 1878. I have referred in the body of the book to various other works, such as Burbidge's 'Narcissus' and Jacobi's 'Agaveæ,' that deal specially with particular tribes and genera. Two out of Bentham's five tribes of the order, *Hypoxideæ* and *Vellosideæ*, have been dealt with recently elsewhere so fully that I have not thought it needful to include them here. The number of genera included is 61, and of species admitted about 670.

AUG 7 - 1923

I should like to take the present opportunity of thanking the numerous cultivators, whose names are mentioned in the body of the work, for the living specimens with which they have supplied me, and of expressing my obligations to Sir J. D. Hooker, Dr. Masters, Dr. Trimmen, and Mr. James Britten, for the opportunity they have given me of publishing in the 'Botanical Magazine,' the 'Gardeners' Chronicle,' and the 'Journal of Botany,' what I have already written on the order.

J. G. BAKER.

KEW HERBARIUM,  
*March 20th, 1888.*

## KEY TO THE GENERA.



Suborder I. AMARYLLEÆ.—Rootstock a tunicated bulb. Leaves all radical. Peduncle a leafless scape.

Tribe 1. CORONATÆ.—Flower furnished with a corona between the perianth and stamens.

\* 1. CRYPTOSTEPHANUS.—Perianth funnel-shaped; tube long. Corona of 12 minute linear scales.—*Angola*.

2. NARCISSUS.—Perianth hypocrateriform; tube long. Corona a distinct petaloid cup.—*Europe, West Asia, North Africa*.

3. TAPEINANTHUS.—Perianth-tube very short. Corona of 6 minute scales.—*Spain, Morocco*.

4. PLACEA.—Perianth funnel-shaped; tube very short. Corona small, membranous, deeply 6-cleft.—*Chili*.

Tribe 2. AMARYLLEÆ GENUINÆ.—Corona none; filaments free.

\* *Anthers erect; filaments inserted at or near the base.*

† *Stamens epigynous; filaments short.*

5. GALANTHUS.—Inner segments different from the outer, permanently connivent.—*South Europe, West Asia*.

6. LEUCOJUM.—Perianth-segments all alike. Filaments short.—*South Europe, North Africa*.

7. LAPIEDRA.—Perianth-segments all alike. Filaments long.—*Spain*.

†† *Stamens perigynous; anthers small, globose.*

8. HESSEA.—Perianth-tube none or very short.—*Cape*.

9. CARPOLYZA.—Perianth-tube distinct.—*Cape*.

††† *Stamens perigynous; anthers oblong or linear-oblong.*

*Flowers solitary.*

10. GETHYLLIS.—Peduncle short. Perianth hypocrateriform. Stamens uniseriate, often numerous.—*Cape*.

11. APODOLIRION.—Peduncle short. Perianth funnel-shaped. Stamens biseriate.—*Cape*.

12. COOPERIA.—Peduncle elongated.—*Texas & North Mexico*.

*Flowers umbellate.*

13. ANOIGANTHUS.—Perianth-tube very short. Filaments long, filiform.—*Cape*.

14. CHLIDANTHUS.—Perianth-tube long. Filaments short, dilated at the base.—*Andes*.

\*\* *Anthers dorsifixed, versatile.*

† *Ovules many, superposed; testa black.*

*Flowers solitary; spathe tubular in the lower half.*

15. STERNBERGIA. — Peduncle short or produced. Perianth regular, erect, bright yellow. Seeds globose.—*South Europe, West Asia.*

16. HAYLÖCKIA. — Peduncle short. Perianth regular, erect, whitish. Seeds flat.—*Monte Video, Buenos Ayres.*

17. ZEPHYRANTHES. — Peduncle elongated. Perianth regular, erect or suberect. Seeds flat.—*America.*

18. SPREKELIA. — Perianth ringent, horizontal, bright red; 3 lower segments convolute; stamens and style declinate.—*Mexico & Guatemala.*

*Flowers umbellate. Spathe 2-4-valved, and pedicels subtended by filiform bracteoles.*

19. UNGERNIA. — Perianth-tube short. Seeds many in a cell, flat, winged. Peduncle solid.—*Asia.*

20. LYCORIS. — Perianth-tube short. Seeds few in a cell, turgid. Peduncle solid.—*China & Japan.*

21. HIPPEASTRUM. — Perianth-tube usually short, rarely long. Seeds many in a cell, usually flat. Peduncle hollow.—*America.*

22. VALLOTA. — Flowers erect. Perianth-tube long, broadly funnel shaped, pulvinate at the throat. Seeds winged at the base.—*Cape.*

23. CYRTANTHUS. — Perianth-tube 2-3 times longer than the oblong segments, naked at the throat. Spathe-valves 2-4.—*Cape, Angola.*

†† *Ovules 2, basal, collateral; testa pale.*

24. GRIFFINIA. — Flowers lilac, umbellate. Leaves broad, thin, petioled.—*Brazil.*

††† *Ovules 2 or few, collateral or fascicled from the centre of the placenta.*

25. CLIVIA. — Fruit baccate. Ovules several. Bulb imperfect.—*Cape.*

26. HÆMANTHUS. — Fruit baccate. Ovules 2. Bulb large, tunicated. Flowers very numerous; segments narrow.—*Cape, Trop. Africa, Socotra.*

27. BUBHANE. — Fruit capsular. Spathe-valves 2.—*Cape, Trop. Africa.*

†††† *Ovules few or many, superposed. Seeds few, green, turgid.*

*Fruit indehiscent or bursting irregularly.*

28. CRINUM. — Perianth-tube long. Flowers white, sometimes flushed or keeled with red.—*Cosmopolitan.*

29. AMARYLLIS. — Perianth-tube short; segments broad.—*Cape.*

30. AMMOCHARIS. — Perianth-tube short; segments narrow, acute.—*Cape.*

*Fruit a 3-valved capsule.*

31. BRUNSVIGIA.—Style filiform. Capsule turbinate, acutely angled.—*Cape.*

32. NERINE.—Style filiform. Capsule globose, obtusely angled.—*Cape.*

33. STRUMARIA.—Style swollen and triquetrous towards the base.—*Cape.*

Tribe 3. PANCRATIEÆ.—Corona, none. Stamens appendiculate towards the base, often united in a distinct cup.

\* *Ovules many or few, superposed.*

† *Leaves broad, petioled.*—*All Andine.*

34. EUCROSIA.—Perianth funnel-shaped, coloured; tube short. Stamens declinate, exserted, irregularly connate and callose at the base.

35. STRICKLANDIA.—Perianth funnel-shaped, coloured. Stamens straight, just exserted, united in the lower half, callose at the base.

36. CALLIPSYCHE.—Perianth funnel-shaped, coloured; tube short. Stamens declinate, much exserted, free, callose at the base.

37. PHÆDRANASSA.—Perianth coloured, subcylindrical; segments long or short. Filaments very obscurely appendiculate towards the base.

38. URCEOLINA.—Perianth coloured; tube cylindrical, suddenly dilated. Filaments very obscurely appendiculate towards the base.

39. EUCHARIS.—Perianth white, regular, subrotate; tube subcylindrical, suddenly dilated. Filaments quadrate, united in a distinct cup.

40. PLAGIOLIRION.—Perianth white; tube short, cylindrical; limb rather irregular. Filaments united in a toothed cup.

41. CALLIPHRURIA.—Perianth white; tube funnel-shaped; segments oblong, as long as the tube. Filaments quadrate, with a large tooth on each side of the anther.

†† *Leaves linear or lorate, sessile.*

42. EUSTEPHIA.—Perianth coloured, subcylindrical; tube short. Filaments with a narrow wing on each side, ending in a tooth.—*Andes of Peru.*

43. STENOMESSON.—Perianth coloured, subcylindrical; tube long. Filaments united in an entire or toothed cup.—*Andes.*

44. HYLINE.—Perianth white; tube none; segments linear. Staminal cup very short.—*Brazil.*

45. PANCRATIUM.—Perianth white; tube funnel-shaped. Staminal cup large.—*Old World.*

\*\* *Ovules 2-6, basal, collateral.*

46. HYMENOCALLIS.—Perianth-tube long. Staminal cup erect.—*Tropical & Subtropical America.*

47. ELISENA.—Perianth-tube short. Staminal cup deflexed.—*Andes.*

\*\*\* *Ovules 2-3, medial.*

48. VAGARIA. — Perianth funnel-shaped; segments narrow. Leaves lorate. Ovary 3-celled.—*Syria*.

49. EURYCLES. — Perianth with a slender tube and broad segments. Leaves broad, petioled. Ovary 3-celled.—*Malaya, Australia*.

50. CALOSTEMMA. — Perianth funnel-shaped. Ovary 1-celled. Leaves various.—*Australia*.

Suborder II. ALSTRÆMERIÆ. — Root of fleshy fibres; rootstock none (except in *Ixiolirion*). Inflorescence a simple or compound umbel. Flowering stems leafy.

\* *Rootstock bulbous.*

51. IXIOLIRION. — Perianth-segments subequal. Stem erect.—*Western Asia*.

\*\* *Rootstock none.*

52. ALSTRÆMERIA. — Three outer segments of perianth different from three inner, and the latter unequal. Stem erect. Ovary 3-celled.—*Brazil, Chili*.

53. BOMAREA. — Three outer segments of perianth different from three inner, the latter equal. Stem usually elongated, sarmentose. Ovary 3-celled.—*Mexico, S. America*.

54. LEONTOCHIR. — Segments of perianth subequal. Ovary 1-celled.—*Chili*.

Suborder III. AGAVEÆ. — Inflorescence racemose, spicate or panicled, not umbellate. Leaves usually rigid, fleshy, spine-edged, aggregated in a dense rosette at the base of the peduncle.

\* *Leaves comparatively thin, neither spine-edged nor spine-pointed.*

55. POLIANTHES. — Inflorescence a lax simple spike. Perianth white, with a long curved subcylindrical tube, and short segments.—*Mexico*.

56. PRŒNYCHANTHES. — Inflorescence a lax raceme. Perianth greenish brown, with short segments, and a tube abruptly curved and dilated at the middle.—*Mexico*.

57. BRAVOA. — Inflorescence laxly spicate or racemose. Perianth red or white, with a curved subcylindrical tube, and very short segments.—*Mexico*.

58. BESCHORNERIA. — Inflorescence a simple or panicled raceme. Perianth greenish red, with scarcely any tube, and long oblanceolate segments.—*Mexico*.

59. DORYANTHES. — Inflorescence a capitulum or thyrsoid panicle. Flowers bright red, with scarcely any tube, and long narrow falcate segments.—*E. Australia*.

\*\* *Leaves thick, fleshy, usually spine-edged and spine-pointed.*

60. AGAVE. — Perianth funnel-shaped; tube short. Filaments long, filiform.—*Trop. America, especially Mexico, Southern United States*.

61. FURCRÆA. — Perianth white, rotate. Filaments strumose at the base.—*Trop. America*.

# HANDBOOK OF AMARYLLIDÆ.

## Suborder I.—AMARYLLIDÆ.

### Tribe 1.—CORONATÆ.

#### 1. CRYPTOSTEPHANUS *Welw.*

*Perianth* narrowly funnel-shaped; segments oblong-lanceolate, ascending, shorter than the more or less curved tube; corona of 12 minute linear fleshy scales inserted at the throat of the tube. *Anthers* 6, small, oblong, nearly sessile, inserted in a single row above the middle of the tube. *Ovary* 3-celled; ovules several, superposed; style half as long as the tube, filiform; stigma capitate. *Fruit* a globose scarlet berry, with 1-2 turgid seeds in each cell.

1. *C. DENSIFLORUS* Welw.; Baker in *Journ. Bot.* 1878, 193, t. 197. — Rootstock a compact corm. Leaves 6-8, contemporary with the flowers, lorate, glaucous, 1 ft. long,  $\frac{1}{3}$ - $\frac{1}{2}$  in. broad. Peduncle stout, 2-edged, shorter than the leaves. Umbel dense, 20-30-flowered; pedicels short; spathe-valves many, unequal, greenish, lanceolate. *Perianth* dark purple,  $\frac{1}{2}$  in. long. Berry  $\frac{1}{3}$  in. diam.

Hab. Angola; Mountains of Huilla, 4000-5500 ft., flowering in October, *Welwitsch!*

#### 2. NARCISSUS *Linn.\**

*Perianth* hypocrateriform; tube varying from obconic to cylindrical; segments subequal, spreading, ascending or reflexing; corona gamophyllous, inserted at the throat of the tube, small or large, saucer-shaped, cup-shaped, or funnel-shaped. *Stamens* 6, inserted in the tube of perianth; filaments short or long; anthers erect, basifixed. *Ovary* 3-celled; ovules many, superposed; style filiform; stigma small, 3-lobed. *Fruit* a membranous capsule with loculicidal dehiscence. *Seeds* subglobose or angled by pressure;

\* Reprinted, with many additions and alterations, from the 'Gardeners' Chronicle' for 1869. See 'The Narcissus; its History and Culture,' by F. W. Burbidge. London: L. Reeve & Co. 1875. It contains figures and descriptions of all the leading types; and full details as to their history, culture, &c.

testa black.—*Bulb* with membranous tunics. *Leaves* linear or subulate, usually contemporary with the flowers. *Flowers* solitary or umbellate, erect or drooping, white or yellow, rarely green, vernal, rarely autumnal; spathe membranous, always 1-valved.

MAGNICORONATI. Corona funnel-shaped or cylindrical, as long as the perianth-segments.

*Corbularia*. Perianth-segments lanceolate.

Stamens long, declinate . . . . . Sp. 1.

*Ajao*. Perianth-segments oblong.

Stamens shorter, erect : . . . . . Sp. 2.

MEDICORONATI. Corona cup-shaped, about half as long as the perianth-segments.

*Ganymedes*. Perianth-segments reflexed . . . . . Sp. 3.

*Queltia*. Perianth-segments spreading . . . . . Sp. 4-6.

PARVICORONATI. Corona small, obconic or saucer-shaped.

*Hermione*. Corona uniform in texture.

Vernal . . . . . Sp. 7-10.

Autumnal . . . . . Sp. 11-13.

*Eunarcissus*. Corona scariose at the edge . . . . . Sp. 14-15.

*Aurelia*. Corona nearly obsolete . . . . . Sp. 16.

Magnicoronate hybrids . . . . . 17-21.

Medicoronate hybrids . . . . . 22-25.

Parvicoronate hybrids . . . . . 26-27.

1. N. *BULBOCODIUM* Linn. Sp. 417; Bot. Mag. t. 88; Red. Lil. t. 24; Burbidge, fig. 1A. *N. turgidus* Salisb. Genus *Corbularia* Salisb. *C. serotina* Haw. — Bulb  $\frac{1}{2}$ – $\frac{3}{4}$  in. diam. Leaves usually 3-4, subterete, ascending, channelled down the face, 3-12 in. long. Peduncle slender, terete, about as long as the leaves. Flower single, ascending; pedicel  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; spathe 1-1 $\frac{1}{2}$  in. long, slit only in the upper half. Perianth 1-1 $\frac{1}{2}$  in. long, bright yellow; tube obconic, as long as the corona; segments lanceolate, ascending,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, broadly keeled with green, turning to brown; corona obconic,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long and broad at the throat, entire or crenulate, just the same colour as the perianth in all the forms. Stamens long, declinate, inserted low down in the tube, reaching nearly to the throat of the corona. Style long, not exerted. The type flowers in May. *C. lobulata* Haw.; Burbidge, fig. 1B, has a repand corona, and flowers in April. *N. obesus* Salisb. flowers early, and has leaves that lie flat on the ground. *N. conspiciuus* (Haw.) Sweet, Brit. Flow. Gard. ii. t. 326; Burbidge, fig. 1c; and *N. aureus* DC., are forms with moderately large yellow flowers, and an exerted style. *N. tenuifolius* Salisb.; Red. Lil. t. 486; Sweet, Brit. Flow. Gard. t. 114, is an early-flowering form, with slender erect leaves, a 6-lobed corona, and exerted style. *C. Bulbocodium* Haw. and *C. Schultesii* Roem. differ from *tenuifolius* by an entire corona.

Var. *N. GRAELLSII* Webb; Bot. Mag. t. 6473 B.—Leaves generally 2, comparatively stout. Pedicel very short. Perianth about an inch long, primrose-yellow,  $\frac{1}{2}$  in. long and broad. Style and often stamens exserted from the corona.—Mountains of Castille.

Var. *N. NIVALIS* Graells.—Leaves 2-3, slender, erect. Peduncle 2-4 in. long. Perianth  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, orange-yellow. Style and stamens exserted.—Mountains of Central Spain and Asturias.

Var. *C. HEDRÆANTHA* Webb & Held. — Leaf solitary. Flower sessile, small, yellow. Corona lobed. Genitalia exserted.—Mountains of Jaen.

Var. *CITRINUS* Baker in Florist, 1880, 67. — Flowers  $1\frac{1}{2}$ -2 in. long, pale lemon-yellow. Corona 1 in. diam. at the throat, obscurely crenulate. Stamens and style included.

Var. *C. MONOPHYLLA* Durieu, Expl. Alger. t. 47; Bot. Mag. t. 5831; Burb. tabs. 2 & 23 B. *N. Clusii* Dunal. — Leaf very slender, usually solitary. Flowers nearly sessile, white,  $1\frac{1}{2}$ -2 in. long. Corona crenate. Style usually exserted.—Algeria, flowering from December to February. *C. albicans* and *cantabrica* Haw. are white-flowered forms, known only from old figures.

Hab. South of France, Spain, Portugal, Algiers, and Morocco. We have a 2-headed form, received in May, 1873, from Mr. J. E. Daniel, of Epsom. For a full account of the forms and their distribution see a paper by Mr. G. Maw, read before the Scientific Committee of the Horticultural Society in February, 1887, printed in the 'Gardeners' Chronicle' and other journals.

2. *N. PSEUDO-NARCISSUS* Linn. Sp. Plant. 414; Engl. Bot. t. 17; Reich. Ic. Germ. t. 816; Burbidge, t. 3. *N. festalis* Salisb. —Bulb ovoid,  $1-1\frac{1}{2}$  in. diam. Leaves 4-6, linear, glaucous, erect, flattish upwards,  $\frac{1}{3}-\frac{1}{2}$  in. broad, about as long as the peduncle. Peduncle about a foot long, with two prominent edges, flowering in March in the type; pedicel  $\frac{1}{2}-\frac{3}{4}$  in. long; spathe  $1\frac{1}{2}$ -2 in. long. Perianth ascending,  $1\frac{1}{2}$ -2 in. long; tube obconic,  $\frac{1}{2}-\frac{5}{8}$  in. long and broad; segments oblong, ascending, pale sulphur-yellow,  $1-1\frac{1}{4}$  in. long,  $\frac{3}{8}-\frac{3}{4}$  in. broad. Corona lemon-yellow, as long as the segments, 1 in. diam. at the throat; edge erect, plicate, irregularly incise-crenate. Stamens erect, inserted low down the tube, reaching halfway up the corona. Style a little longer than the stamens. *A. serratus* Haw. has segments shorter than the corona. *A. nobilis* Haw. (Red. Lil. t. 158) has spreading segments, and a spreading throat to the corona. *A. lobularis*, *cambricus*, and *obvallaris* Haw. (Bot. Mag. t. 1301, lower figure) are forms between this type and *major*, with shorter rather imbricated segments, and a corona with a spreading deeply 6-lobed throat. *A. rugilobus* Haw. has pale segments longer than the deeply 6-lobed corona, the lobes of which are very plicate. *A. pallidus-præcox* Hort. is an early-flowering form from the Pyrenees, with very pale flowers. *A. variiformis* (Parkins) is a Pyrenean form between this type and *moschatus*. Var. *Johnstoni* Baker is a Portuguese form with a tube  $\frac{3}{4}$  in. long,  $\frac{1}{3}$  in. broad at the throat, a pale truncate corona, and style much longer than the stamens.

Subsp. *A. muticus* Gay. *Oileus abscissus* Haw. — Stature of the last. Leaves a little broader. Flower  $1-1\frac{1}{2}$  in. long; tube obconic,

$\frac{1}{3}$  in. long and broad; segments sulphur-yellow,  $1-1\frac{1}{2}$  in. long; corona deep lemon-yellow, as long as the segments,  $\frac{3}{4}$  in. diam. at the very truncate throat. — Pyrenees. Haworth's other species of *Oileus*, *hexangularis*, *minor*, *albus*, and *pumilus*, are known only from old figures.

Subsp. A. *CYCLAMINEUS* Haw. *N. cyclamineus* Baker in Bot. Mag. t. 6950. — Leaves narrow linear, with a deeply grooved keel. Peduncle stender, subterete. Flower very drooping; tube obconic, 1-12th in. long; segments abruptly reflexed, lemon-yellow,  $\frac{1}{4}$  in. broad; corona as long as the segments, orange-yellow, crenate at the throat, under  $\frac{1}{2}$  in. diam.—An old type, lately rediscovered near Oporto by Messrs. Johnston and Tait.

Subsp. N. *MAJOR* Curt. in Bot. Mag. t. 51; Burbidge, tab. 4A. *N. hispanicus* Gouan. — More robust than *Pseudo-narcissus*, and larger in all its parts. Leaves  $\frac{1}{2}-\frac{3}{4}$  in. broad. Flower 2-2 $\frac{1}{2}$  in. long; tube obconic,  $\frac{3}{4}$  in. long and broad; segments in the type spreading, not imbricated, lemon-yellow,  $1\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. broad, just the same length and nearly the same shade as the corona, which has a deeply-lobed ascending much crisped margin, and a throat about an inch in diameter. *A. propinquus* Haw. (Bot. Mag. t. 1301, upper figure) has more ascending segments; *A. maximus* Haw. (Burbidge, tab. 4B), a larger flower, and more spreading corona-rim; *A. spurius* Haw., broad imbricated perianth-segments, and a very spreading corona-rim; *A. Telamonius* Haw., of which the double-flowered form is very common in gardens, has the sulphur-yellow segments of *Pseudo-narcissus* and the large flower of *major*; and *A. tubaeflorus* Herb. and *A. lorifolius* Haw. (Bot. Mag. t. 1187) are forms between *major* and *bicolor*. Upwards of fifty forms have garden names.

Subsp. N. *MINOR* Linn. Sp. Pl. 415; Red. Lil. t. 480; Burbidge, t. 5A.—Much smaller in all its parts than *Pseudo-narcissus*. Leaves 3-4 in. long,  $\frac{1}{4}$  in. broad. Flower  $1-1\frac{1}{4}$  in. long; tube obconic,  $\frac{1}{2}$  in. long and broad; segments sulphur-yellow, oblong,  $\frac{3}{4}$  in. long; corona deeper yellow, with a deeply 6-lobed spreading throat. *A. pumilus* Haw. is rather more robust, with perianth-segments cuneate at the base. *A. nanus* Haw. is as robust as the type, with imbricated perianth-segments longer than the corona, the throat of which is less lobed and suberect. *A. minimus* Haw. (Bot. Mag. t. 6; Burbidge, t. 5B) is only 3-4 in. high, nutant before the flower opens, with leaves  $\frac{1}{8}$  in. broad, and flower like that of the type, but much smaller.

Subsp. N. *BICOLOR* Linn. Sp. Pl. 415. — Stature of *Pseudo-narcissus* or *major*. Segments pure white, spreading, much imbricated,  $1-1\frac{1}{2}$  in. long; corona the same length, bright lemon-yellow, with a spreading inciso-crenate crisped throat  $1-1\frac{1}{2}$  in. diam. Varies in size from *A. breviflos* Haw. (Bot. Mag. t. 1187) to *Horsfieldii* and *Emperor* (Burbidge, t. 9A). Thirty forms have garden names.

Subsp. N. *MOSCHATUS* Linn. Sp. Pl. 415; Bot. Mag. t. 1300; Burbidge, t. 7. *N. candidissimus* Red. Lil. t. 188. — Stature and leaf of *Pseudo-narcissus*. Perianth-tube obconic, nearly as broad as

long; segments 1-1 $\frac{1}{4}$  in. long, more or less ascending, twisted, at first tinged with sulphur, finally pure white, as long as the corona, which has an inciso-crenate plicate throat about an inch across. *A. albicans* Haw. has a larger flower, with more imbricated segments. *A. cernuus* Haw.; Sweet, Brit. Flow. Gard. ii. t. 101; Burbidge, t. 8, a more drooping flower, with a tube distinctly longer than broad, and segments sometimes longer than the corona. *A. tortuosus* Haw.; *N. longiflorus* Salisb. (Bot. Mag. t. 924), twisted perianth-segments shorter than the corona.

Hab. Sweden and England to Portugal, Spain, Italy, and Transylvania; *major*, *moschatus*, and *minor* are confined to the Pyrenees and Spanish Peninsula, and *bicolor* is not clearly known in a wild state. Altogether between 150 and 200 forms are distinguished by name by the English cultivators.

3. *N. TRIANDRUS* Linn. Sp. Pl. 416; Burbidge, t. 15A. Genera *Illus* and *Ganymedes* Haw. *Illus triandrus* Haw. *Ganymedes albus* Haw. — Bulb  $\frac{1}{2}$ - $\frac{3}{4}$  in. diam. Leaves 2-4, very slender, subterete, channelled down the face. Peduncle very slender, subterete,  $\frac{1}{2}$ -1 ft. long. Flowers 1-6, drooping; spathe 1-1 $\frac{1}{2}$  in. long; pedicels shorter or longer than the spathe. Perianth about an inch long; tube cylindrical,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long; segments lanceolate, sharply reflexed, acute, as long as the tube, pure white in the type; corona cup-shaped, truncate at the throat, half as long as the segments and the same colour. Stamens and style very variable in length, often exserted from the corona. *G. concolor* Haw. has a concolorous pale yellow flower. In *N. pallidulus* Graells (Bot. Mag. t. 6473A) both segments and corona are primrose-yellow. In *G. pulchellus* Haw. (Bot. Mag. t. 1262; Sweet, Brit. Flow. Gard. ser. 2, t. 99) the corona is white and the segments yellow. In *G. nutans* Haw. (*N. trilobus* Bot. Mag. t. 945) the corona is crenulate and a deeper yellow than the segments. *G. cernuus* Salisb. (Bot. Mag. t. 48) is a robust many-flowered form, coloured as in the last.

Subsp. *N. CALATHINUS* Red. Lil. t. 177; Burbidge, t. 14. *Assaracus capax* Haw. — Corona larger, nearly as long as the segments, both pale sulphur-yellow.—Isle of Glenans, Brittany. The Portuguese *N. reflexus* Brot. Red. Lil. t. 40; *Assaracus reflexus* Haw.; connects it with the type.

Hab. The type, Spain and Portugal, flowering in April and May.

4. *N. INCOMPARABILIS* Miller in Gard. Dict. 1771, No. 3; Bot. Mag. t. 121; Reich. Ic. t. 819; Engl. Bot. ed. 3, t. 1502; Burbidge, t. 17A. *N. Gouani* Red. Lil. t. 220. Genus *Queltia* Salisb. *Q. fetida* Herb. — Bulb 1-1 $\frac{1}{2}$  in. diam. Leaves about 4, linear, glaucous, obtusely keeled,  $\frac{1}{2}$  in. broad. Peduncle distinctly 2-edged, 1-1 $\frac{1}{2}$  ft. long. Flower solitary, not fragrant, ascending or horizontal; pedicel shorter than the spathe. Perianth-tube subcylindrical, green,  $\frac{3}{4}$  in. long, dilated at the throat; segments spreading, ovate-oblong, imbricated, 1-1 $\frac{1}{4}$  in. long, pale yellow in the type; corona obconic,  $\frac{1}{2}$  in. long, lemon-yellow,  $\frac{3}{4}$  in. diam. at the 6-lobed crenulate plicate throat. Stamens and style not exserted. The form called Sir Watkin has flowers 4 in. diam. *Q. concolor* Haw. (Burbidge, t. 19A) has segments and corona both pale lemon-yellow.

*Q. semipartita* Haw. is coloured like the type, but the corona is lobed more deeply.

Var. *Q. AURANTIA* Haw.; Burbidge, t. 19 c. *Q. Gouani* Haw.—Perianth pale yellow. Corona pale yellow at the base, orange at the spreading lobed very plicate throat. Common in gardens double, called “Butter and Eggs.” Var. *Leedsii* Hort. has a rim of orange-red to the corona.

Var. *Q. ALBA* Haw.; Burbidge, t. 18 B, C, 19 B.—Perianth white; corona lemon-yellow. Common double in gardens, called “Orange Phoenix.” *Q. nivea* Haw., dwarfier, with narrower twisted perianth-segments.

Hab. Spain and the south-west of France eastward to the Tyrol. Flowers in England late in March or early in April. About 100 forms are named by cultivators.

5. *N. ODORUS* Linn. Sp. Pl. 416; Red. Lil. t. 157; Reich. Ic. Germ. t. 818; Burbidge, t. 23. *N. calathinus* Bot. Mag. t. 934. Genus *Philogyne* Haw. *P. odora* and *Campernelli* Haw. — Bulb 1–1½ in. diam. Leaves 3–4, narrow, linear, bright green, deeply channelled down the face, ¼ in. diam. Peduncle subterete, 1–1½ ft. long. Flowers 2–4, uniform bright yellow, fragrant; pedicels shorter than the spathe. Perianth-tube subcylindrical, greenish, ¾ in. long; segments obovate-oblong, cuneate in the lower half, spreading, not imbricated, 1–1¼ in. long; corona obconic, the same colour as the segments, ½ in. long, with a spreading throat ¾ in. diam., with 6 short crenate lobes. Style overtopping the anthers, reaching halfway up the corona. *P. rugulosa* (Burbidge, t. 25 A), *calathina*, and *interjecta* Haw. are forms with shorter oblong imbricated perianth-segments.

Var. *N. TRILOBUS* Linn. Sp. Pl. 417. *N. latus* Salisb.—Flowers smaller, with imbricated segments about ¾ in. long, not more than half as long again as the lobed corona. *P. Curtisii* Haw. (Bot. Mag. t. 78) and *P. heminalis* Haw. (Burbidge, t. 24) are small-flowered forms, with a narrow less-lobed corona.

Var. *MINOR* Burbidge, 25 B, has flowers an inch in diam. and a much smaller corona than any other form. It is very likely *N. Assoanus* Dufour.

Hab. Spain and France to Italy and Dalmatia. Flowers about London early in April.

6. *N. JUNCIFOLIUS* Lagasca, Gen. et Sp. 13, non Salisb.; Burbidge, t. 37 A. *N. Requienii* Roem. *Queltia juncifolia* Herb. *Philogyne minor* Haw. — Bulb ½–¾ in. diam. Leaves 3–4, terete, very slender, green, erect, 4–6 in. long, 1–12th in. diam. or less. Peduncle slender, terete, ½–1 ft. long. Umbel 1–4-flowered; pedicels ½–1½ in. long. Perianth-tube cylindrical, slender, about ½ in. long; segments spreading, bright yellow, ovate, imbricated, ⅓–½ in. long; corona the same shade or rather darker, cup-shaped, ⅓–¼ in. long, ⅓–½ in. broad at the crenulate throat. Style reaching to the throat of the tube.

Subsp. *N. GADITANUS* Boiss.; Burbidge, t. 27 c. — Flowers often 4–5. Pedicels longer. Perianth-segments not more than ⅓ in. long, broad-ovate. Corona truncate, nearly as long as the segments.

Subsb. *N. MINUTIFLORUS* Willk. Ill. Hisp. t. 74.—Flowers about 4. Pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Perianth-tube  $\frac{1}{3}$  in. long; segments ovate,  $\frac{1}{8}$  in. long; corona truncate.

Subsp. *N. RUPICOLA* Dufour.; Bot. Mag. t. 6473c. *N. apodantha* Boiss. et Reut. *Queltia apodantha* Kunth. — Pedicel none or very short. Perianth-tube  $\frac{3}{4}$  in. long; expanded limb  $\frac{3}{4}$  in. diam.; corona distinctly 6-lobed.

Hab. Spain, Portugal, and the South of France; the varieties, Spanish and Portuguese. Flowers about London in the middle of April.

7. *N. TAZETTA* Linn. Sp. Pl. 416; Sibth. Fl. Græca, t. 358; Moggr. Cant. Ment. t. 23; Burbidge, t. 29. *Hermione* Haw. *Hermione*, *Plateana*, and *Chione* Salisb.—Bulb  $1\frac{1}{2}$ –2 in. diam. Leaves 4–6, linear, glaucescent, 1–1 $\frac{1}{2}$  ft. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad, bluntly keeled. Peduncle distinctly compressed, 1–1 $\frac{1}{2}$  ft. long. Umbel usually 4–8-flowered in the type; longer pedicels equalling or exceeding the spathe. Perianth-tube cylindrical, greenish,  $\frac{3}{4}$  in. long; limb 1–1 $\frac{1}{4}$  in. diam; segments pure white, obovate, imbricated,  $\frac{1}{3}$  in. broad; corona cup-shaped, lemon-yellow, entire,  $\frac{1}{8}$  in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad. Anthers and style just exerted from the tube.

Of the multiform *Tazetta Narcissi* about 100 have received specific names.\* I can here only attempt to indicate and classify the leading types.

Series I.—*TAZETTINÆ BICOLORES*. Perianth white; corona yellow.

Subsp. 1. *H. LACTICOLOR*. — From the type, as above described, the following differ but little:—*N. elatus*, *varians*, and *canaliculatus* Guss.; *N. neglectus* Ten.; *N. Tenorii*, *spiralis*, and *Bicchianus* Parl.; *N. syriacus* Boiss.; *N. Bianca* Tod.; *N. Aschersonii* Bolle; *H. Cypri* Haw.; Sweet, Brit. Flow. Gard. ii. t. 92; *H. citrina* Haw.; Jord. Ic. t. 180; *H. floribunda* Haw.; Jord. Ic. t. 181; *H. monspeliensis* Jord. Ic. t. 186; *H. pratensis* Jord. Ic. t. 187; *H. formosa* Jord. Ic. t. 189; *H. decora* and *auranticorona* Haw.; *H. neglecta*, *antipolensis*, *littoralis*, and *lobata* Jord.; *H. Trewiana* Haw. (Bot. Mag. t. 940; Jord. t. 188), *flexiflora*, *subcrenata*, and *crenulata* Haw., have a perianth-limb  $1\frac{1}{2}$ –2 in. diam., and a corona  $\frac{1}{2}$  in. diam.; *N. grandicrenatus* Parl., a large deeply-lobed corona; *H. crispicorona* Haw. (Jord. Ic. t. 190) and *corrugata* Jord., a large crisped orange corona.

Subsp. 2. *H. CORCYRENSIS* Herb. — Colour of type, but flower smaller, with narrower more acute non-imbricating segments. Near this are *H. aquilimba* Herb.; *H. mediterranea* Jord. Ic. t. 185; *H. insolita* Jord. t. 184; *N. remopolensis* Parl.; *H. sulcicaulis* Haw.; and *H. debilis*, *discreta*, and *contorta* Jord. *H. ganymedoides* Jord. has reflexed lanceolate segments, and a lobed orange corona.

Subsp. 3. *N. PATULUS* Lois. — Dwarfier and more slender than the type, with a pure white perianth-limb  $\frac{3}{4}$ – $\frac{7}{8}$  in. diam. and a small lemon-yellow corona. Near this are *N. etruscus*, *Ricasolimus*,

\* For further details see Haworth's 'Monograph,' pp. 8–12, Kunth's 'Enumeratio,' Herbert's 'Amaryllidaceæ,' Parlatores's 'Flora Italica,' vol. iii. pp. 125 to 156, and Jordan & Fourreau's 'Icones' and 'Breviarum Plantarum Novarum.'

*veryellensis*, and *siculus* Parl.; *H. fistulosa*, *cerina*, and *breviflora* Haw.; and *H. jucunda* and *modesta* Jord.

Subsp. 4. *N. OCHROLEUCUS* Lois. (Bot. Mag. t. 1298). *H. tereticaulis* Haw.; Sweet, Brit. Flow. Gard. ii. t. 179, connects *Tazetta* with *gracilis* and *intermedius* by its green deeply-channelled leaves and subterete peduncle. Expanded perianth-limb 1-1½ in. diam.; segments imbricated; corona lemon-yellow, ¼ in. long, ½ in. diam. at the erect entire throat.

Series II.—TAZETTINÆ ALBÆ. Perianth and corona both white.

Subsp. 5. *N. POPYRACEUS* Ker in Bot. Mag. t. 947; Jord. Ic. t. 179. *N. unicolor* Ten. *N. niveus* Lois. *Chione* Salisb.—Peduncle acutely angled. Expanded perianth-limb about 1½ in. diam.; segments oblong, acute, little imbricated; corona pure white, ⅓ in. long, ¼ in. diam. at the erect entire throat. Flowers more numerous and more fragrant than in the type.—Allied to this are *H. jasminea* Haw., *N. Gennarii* Parl., and *H. virginea* Jord.

Subsp. 6. *N. PANIZZIANUS* Parl.; Moggr. Ment. t. 71A; Burbidge, t. 36.—Flowers fewer than in the last; expanded limb ¾-⅞ in. diam.; segments oblong, acute, little imbricated. — Allied to this are *H. virginea* Jord. Ic. t. 177; and *H. Sequentiæ* Todaro.

Subsp. 7. *N. DUBIUS* Gouan; Moggr. Ment. t. 71B,C,D; Burbidge, t. 28. — Leaves ¼ in. broad. Flowers few. Expanded perianth-limb ½-¾ in. diam.; segments ovate, imbricated; corona pure white, half as long as the perianth-segments. — South-east of France.

Subsp. 8. *N. CANARIENSIS* Herb.; Burbidge, t. 48. — Expanded limb about ½ in. diam.; segments narrow, acute; corona small. — Allied to this is *H. micrantha* Jord. Ic. t. 176, from Toulon.

Sub. 9. *N. PACHYBOLBOS* Durieu, Expl. Alger. t. 47, fig. 1; Burbidge, t. 39; Bot. Mag. t. 6825. — Bulb very large. Flowers many. Expanded limb ⅝-¾ in. diam.; segments ovate-oblong, obtuse, much imbricated; corona small.—Algeria.

Subsp. 10. *N. POLYANTHOS* Lois.; Reich. Ic. Germ. t. 367.—Leaves green. Flowers 10-20. Perianth-limb 1-1½ in. diam.; segments broad, imbricated; corona ⅓ in. diam., faintly tinged at first with sulphur-yellow, finally milk-white. — Near this, but with smaller flowers, are *H. Luna* Haw., *N. Barlæ* Parl., and *H. hololeuca* Jord.

Series III.—TAZETTINÆ LUTÆ. Perianth and corona both yellow.

Subsp. 11. *N. ITALICUS* Sims in Bot. Mag. t. 1188. *N. præcox* Ten. *N. subalbidus* Lois. — Leaves green, nearly flat. Peduncle sharply 2-edged. Flowers often 10-12; expanded limb 1½-2 in. diam., nearly white; segments oblong, acute, little imbricated; corona lemon-yellow, ¼ in. long, ½ in. diam., often distinctly 6-lobed. — Allied to this are *H. stylosa* Salisb., *H. tenuiflora* Haw., and *N. obliquus* Guss.

Subsp. 12. *H. BERTOLONII* Jord. Ic. t. 192. *N. Bertolonii* Moggr. Cont. Ment. t. 90B. *N. chrysanthus* Moggr. Ment. t. 90A.—Flowers

fewer than in the last, bright yellow, both corona and oblong acute non-imbricated segments.

Subsp. 13. *N. AUREUS* Lois.; Moggr. Ment. t. 22; Jord. Ic. t. 194. — Expanded perianth-limb 1–1½ in. diam., lemon-yellow; segments ovate, much imbricated; corona entire, a little darker than the segments.—Allied to this are *H. xanthea* Jord. Ic. t. 193; *H. luteola* Jord. Ic. t. 195; *H. chlorotica* Jord. Ic. t. 191 (limb sulphur-yellow); *H. cheiranthea*, *calliopsis*, *amæna*, and *sertulosa* Jord.; and *H. sublutea*, *flaveola*, *trifida*, and *reflexicaulis* Haw.

Subsp. 14. *H. CUPULARIS* Salisb. (Red. Lil. t. 17; Bot. Mag. t. 925). — Segments broadly imbricated, lemon-yellow; corona orange-yellow. — Allied to this are *H. multiflora*, *solaris*, *latifolia*, *perlutea*, and *aperticorona* Haw.; and *H. nobilis*, *splendens*, *callichroa*, *eriodora*, and *fulgida* Jord.

Hab. Extends from Canary Islands and Portugal through the South of Europe to Syria, Cashmere, China, and Japan. The principal concentration of various forms is in Italy and the South-east of France. Flowers from January to May.

8. *N. INTERMEDIUS* Lois. Gall. i. 237, t. 7; Red. Lil. t. 427; Moggr. Cont. Ment. t. 41; Burbidge, t. 38A. *Hermione* Herb.—Bulb ovoid, 1–1½ in. diam. Leaves about 4, subterete, bright green, deeply channelled down the face, ¼ in. diam. Peduncle subterete, a foot or more long. Umbel 4–10-flowered; longer pedicels as long as the spathe. Perianth-tube subcylindrical, greenish, ⅝–¾ in. long; segments oblong, slightly imbricated, spreading, bright lemon-yellow, ¾ in. long; corona cup-shaped, orange-yellow, ⅓ in. long, ¼ in. broad at the slightly-lobed throat. Style and anthers just exerted from the perianth-tube. *H. bifrons* Haw.; Burbidge, t. 38A, has narrower perianth-segments, and a longer corona. *H. primulina* Haw. (Bot. Mag. t. 1299) has imbricated segments, and a corona with a spreading 6-lobed margin. *H. biscrenata* Haw. is a robust many-flowered form, with 6 bifid plicate lobes to the corona. *H. compressa* Haw. (*N. radiatus* Red. Lil. t. 459) has a large plane 6-lobed corona. *H. alba* Haw., known only from old records, has white flowers.

Hab. Spain, Balearic Isles, and South of France. Differs from the *Tazettine luteæ* by its subcylindrical green leaves. Salisbury forms of it, with *N. Jonquilla*, his genus *Tityrus*.

9. *N. GRACILIS* Sabine in Bot. Reg. t. 816 (1824); Sweet, Brit. Flow. Gard. ii. t. 136; Burbidge, t. 37A. Genus *Helena* Haw. Genus *Veneria* Salisb. — Bulb 1 in. diam. Leaves narrow, linear, green, a foot long, ⅓–⅓ in. broad. Peduncle weak, slender, subterete, a foot long. Umbel 1–3-flowered; pedicels long. Perianth-tube cylindrical, yellowish-green, ¾–1 in. long; segments bright yellow, spreading, imbricated, oblong, acute, an inch long; corona obconic, deeper yellow, 1-6th to 1-5th in. long, ½ in. broad at the slightly plicate erect crenulate throat. Stamens and style not exerted from the corona. *N. tenuior* Curt. in Bot. Mag. t. 379 (1797); Burbidge, t. 37B, is more slender in all its parts, with smaller paler flowers, changing to white as they grow old. *H.*

*planicorona* Haw. has very narrow leaves, very pale flowers, and a subterete corona.

Hab. An old garden plant, found wild, according to Salisbury, by Le Venier near Bordeaux.

10. *N. JONQUILLA* Linn. Sp. Pl. 417 (excl. syn.); Curt. in Bot. Mag. t. 15; Red. Lil. t. 159; Reich. Ic. t. 811; Burbidge, t. 40. *Queltia* Herb. *Jonquilla* Haw. *Tityrus* Salisb. *N. juncifolius* Salisb., non Lag. — Bulb 1–1½ in. diam. Leaves 2–4 to a stem, subterete, 8–12 in. long, bright green, deeply channelled down the face, ⅜ in. diam. Peduncle slender, subterete. Umbels 2–6-flowered; longer pedicels as long as the spathe. Perianth-tube cylindrical, greenish, ¾–1 in. long; segments bright yellow, obovate, spreading, scarcely imbricated; corona cup-shaped, the same colour as the segments, ⅜ in. long, ⅓ in. broad at the crenate throat. Stamens and style just imbricated from the tube. *J. major* and *media* Haw. differ a little in stature.

Var. *J. MINOR* Haw. *N. Webbii* Parl.—A dwarf form, with very slender leaves, and a perianth-limb only ½ in. diam. — South of Spain and Algeria.

Var. *STELLARIS* Baker.—Segments lanceolate, reflexing; corona distinctly 6-lobed.

Subsp. *N. JONQUILLOIDES* Willk. Ill. Fl. Hisp. t. 138.—Perianth-tube ½ in. long; limb ¾ in. diam.; segments obovate, imbricated; corona more than half as long as the segments; throat erect, plain, truncate.

Hab. Spain, through France and Italy to Dalmatia and Algeria. Flowers with us late in April. Very fragrant.

11. *N. VIRIDIFLORUS* Schonsb. Maroc. fasc. i. t. 2; Bot. Mag. t. 1687; Burbidge, t. 44. *Hermione* Herb. *Chloraster fissus* Haw. *Prasiteles* Salisb.—Bulb globose, 1 in. diam., with tunics produced far above its neck. Leaves 1–2, subterete, not produced with the flowers. Peduncle slender, fragile, 1–1½ ft. long. Umbel 2–4-flowered; pedicels long, erect. Perianth-tube cylindrical, slender, green, ½–⅝ in. long; segments green, lanceolate, acute, reflexing, shorter than the tube; corona very short, green, 6-lobed down to the base. Anthers just exerted from the perianth-tube. *C. integer* Haw. is said to have an entire corona.

Hab. Morocco and Gibraltar, flowering in November.

12. *N. SEROTINUS* Linn. Sp. Pl. 417; Burbidge, t. 46. *Hermione* Haw. *Argenope* Salisb.—Bulb globose, ½–1 in. diam. Leaves very slender, subterete, not produced till after the flowers are gone. Peduncle very slender, flexuose and with 1–2 swollen joints low down, which are often hidden by the produced tunics. Flowers often solitary, sometimes 2. Perianth-tube greenish, subcylindrical, ½–⅝ in. long; segments of the limb spreading, pure white, oblanceolate, obtuse, minutely cuspidate, about ½ in. long. Corona 1–16th in. long, lemon-yellow, 6-lobed. Anthers just exerted from the perianth-tube.

Var. *N. DEFICIENS* Herb. in Bot. Reg. 1847, tab. 22, fig. 1.—Corona reduced to a mere rudiment.

Hab. Through the Mediterranean region from Spain to Greece and Palestine. Flowers in October and November. *Carregnoa dubia* Willk. Ic. t. 74 A, appears to be a form of this, with the corona slit down to the base into six square segments.

13. *N. ELEGANS* Spach Veg. Phan. xii. 452; Burbidge, t. 45. *Hermione* Haw. *N. autumnalis* Link. *N. Cupanianus* Guss. *N. oxypetalus* Boiss.—Bulb globose, 1 in. diam. Leaves 1-4, contemporary with the flowers, subterete, green, 4-6 in. long, 1-16th in. diam. Peduncle rather shorter than in *serotinus*, stiffly erect, not jointed. Umbel 2-6-flowered; pedicels erect, often longer than the spathe. Perianth-tube cylindrical, greenish white,  $\frac{1}{2}$ - $\frac{3}{8}$  in. long; segments pure white, spreading, lanceolate, acute, not imbricated,  $\frac{1}{2}$  in. long. Corona saucer-shaped, yellow, 1-20th in. deep.

Var. *H. OBSOLETA* Haw.; Herb. Amaryll. t. 41, fig. 28.—Perianth-segments rather broader; corona nearly obsolete.

Hab. Italy, Sicily, and Algeria, flowering in September and October.

14. *N. BIFLORUS* Curt. Bot. Mag. t. 197; Engl. Bot. t. 276; Red. Lil. t. 405; Burbidge, t. 41. *N. medio-luteus* Miller (1771).—Bulb globose,  $1\frac{1}{2}$ -2 in. diam. Leaves about 4, linear, slightly glaucous, broadly channelled down the face, 1-2 ft. long,  $\frac{1}{2}$ - $\frac{5}{8}$  in. broad. Peduncle sharply 2-edged, 1-1 $\frac{1}{2}$  ft. long. Flowers usually 2, rarely 1 or 3; pedicels shorter than the spathe. Perianth-tube cylindrical, greenish white, an inch long; segments obovate, milky-white, imbricated, obtuse, minutely cuspidate,  $\frac{3}{4}$ -1 in. long; corona obconic,  $\frac{1}{8}$  in. long, pale yellow,  $\frac{1}{4}$  in. diam. at the scariose erect much-crisped edge. Stamens and style just exerted from the perianth-tube. *N. dianthos* Haw. has pure white flowers, non-imbricated perianth-segments, and an orange-yellow corona. *N. biflorus* Haw. has 2-3 flowers, pure white imbricated segments, and an orange-yellow corona. *N. albus* Miller has snow-white flowers, with imbricated segments, and a more spreading corona, tinged with red.

Hab. France, Switzerland, Italy, and the Tyrol, flowering in England in May. The three varieties are intermediate between the type and *poeticus*.

15. *N. POETICUS* Linn. Sp. Pl. 414; Red. Lil. t. 160.—Bulb 1-1 $\frac{1}{2}$  in. diam. Leaves about 4, linear, glaucous, a foot or more long,  $\frac{1}{4}$ - $\frac{1}{3}$  in. broad. Peduncle 2-edged, as long as the leaves. Flower solitary, ascending or horizontal, fragrant, developed in the type in May. Perianth-tube cylindrical, greenish, an inch long; segments spreading, pure white, obovate, imbricated, an inch long; corona  $\frac{1}{8}$ - $\frac{1}{6}$  in. long, with a scariose red much-crisped edge  $\frac{1}{2}$  in. diam. Style and stamens just exerted from the perianth-tube. *N. patellaris* Haw. (Engl. Bot. t. 275) is a robust late-flowering form with imbricated perianth-segments. *N. spatulatus* Haw. has smaller earlier flowers. *N. stellaris* Haw. (Sweet, Brit. Flow. Gard. ii. t. 132 and *N. recurvus* Haw. (Sweet, ii. t. 188) are late-flowering forms, with scarcely imbricated perianth-segments, the latter with weak recurving leaves. *N. poetarum* Haw. flowers in April, and has large flowers, with imbricated segments, and a corona fulvous down to the base. *N. tripodalis* Salisb. (*N. ornatus* Haw.) is an early form, with rather reflexing narrower segments.

Subsp. *N. RADIFLORUS* Salisb. *N. angustifolius* and *majalis* Curt. Bot. Mag. t. 193. — Leaves  $\frac{1}{8}$ – $\frac{1}{6}$  in. broad, shorter than the slender peduncle. Perianth-segments cuneately narrowed in the lower half, and not imbricated. *N. verbanensis* Haw. Amaryll. t. 37, fig. 2; Burbidge, t. 43, fig. B, is a dwarf form, with narrow leaves, and lanceolate acute reflexing perianth-segments.

Hab. All through the Mediterranean region from France to Greece.

16. *N. BROUSSONETHI* Lag. Nov. Gen. 13; Burbidge, t. 47. *Aurelia* J. Gay. *N. obliteratus* Willd. *Hermione* Haw. — Bulb  $1\frac{1}{2}$  in. diam. Leaves about 4, linear, contemporary with the flowers,  $\frac{1}{4}$  in. broad. Peduncle 2-edged, a foot long. Umbel many-flowered; pedicels 1–2 in. long. Perianth-tube whitish, cylindrical, with a funnel-shaped apex,  $\frac{3}{4}$  in. long; segments oblong, obtuse, pure white,  $\frac{1}{2}$  in. long; corona rudimentary. Anthers exerted from the perianth-tube.

Hab. Morocco; long lost, but lately regathered by Dr. Leared and others. Flowers in April. Habit of *N. italicus*.

#### HYBRID NARCISSI.\*

17. *N. BULBOCODIO-PSEUDO-NARCISSUS* Baker in Gard. Chron. 1887, i. 414. — Leaf linear, slightly glaucescent, channelled down the face,  $\frac{1}{6}$  in. broad. Peduncle slender, terete, 1-flowered; spathe an inch long, tubular in the lower half; pedicel as long as the spathe. Flower horizontal, milky-white,  $1\frac{1}{2}$  in. long; tube narrowly funnel-shaped, much tinged with green,  $\frac{5}{8}$  in. long,  $\frac{1}{6}$  in. diam. at the throat; segments linear, ascending, rather shorter than the corona. Corona  $\frac{5}{8}$  in. long,  $\frac{1}{4}$  in. diam. at the base, faintly crenulate at the throat, where it is  $\frac{1}{3}$  in. diam. Stamens inserted low down the tube; filaments straight, anthers only just protruded from the tube. Style reaching halfway up the corona.

Hab. Portugal, near Oporto, found wild by Messrs. Tait and Barr in March, 1887. This or a nearly-allied form is figured Gard. Chron. 1887, vol. i. fig. 78. *N. triandrus* also hybridises naturally both with *N. Pseudo-narcissus* and *Bulbocodium*.

18. *N. HUMEI* Hort. *N. poculiformis luteus* Herb. Leeds. — Leaf  $\frac{1}{3}$  in. broad. Flower solitary, cernuous; tube obconic,  $\frac{1}{2}$  in. long,  $\frac{1}{3}$  in. broad; segments oblong, loosely ascending, sulphur-yellow,  $1\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. broad; corona lemon-yellow, about an inch long and an inch broad at the erect throat, which is minutely crenulate. Var. *albidus* Hort. has milk-white ascending segments, and a lemon-yellow corona.

Hab. A hybrid raised by Dr. Leeds, of Manchester, no doubt between *poculiformis* and some form of *Pseudo-narcissus*.

19. *N. BACKHOUSEI* Hort. — Stature and leaves of *Pseudo-narcissus*. Flower solitary, horizontal; tube obconic, about  $\frac{1}{2}$  in. long and broad; segments spreading horizontally, oblong, imbricated, sulphur-yellow.  $1-1\frac{1}{4}$  in. long; corona lemon-yellow, a little shorter than the segments, with a deeply-lobed plicate erect throat.

\* See Herbert in Journ. Hort. Soc. ii. 21 to 28.

Hab. An intermediate form between *Pseudo-narcissus* and *incomparabilis*. Named after W. Backhouse, Esq., of Darlington and St. John's in Weardale, who raised many new garden forms.

20. *N. MACLEAII* Lindl. in Bot. Reg. t. 987; Bot. Mag. t. 2588; Burbidge, t. 17. *Diomedes minor* Haw. *Panza bicolor* Salisb.—Bulb above 1 in. diam. Leaves about 6, linear, bright green,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad. Peduncle a foot long, slightly 2-edged, 1-flowered. Flower horizontal, inodorous; pedicel much shorter than the spathe. Perianth-tube subcylindrical,  $\frac{3}{4}$  in. long, white tinged with green; segments milk-white, obovate-oblong, much imbricated,  $\frac{3}{4}$  in. long; corona bright yellow,  $\frac{1}{2}$  in. long and broad, minutely crenate at the throat. Stamens biseriate. Style included. *N. Sabini* Lindl. in Bot. Reg. t. 762 (*Diomedes major* Haw.) is more robust, with a larger flower, and corona longer in proportion to the segments. *N. Nelsoni*, a garden type with many forms, is more robust than *Macleaii*, with segments 1–1 $\frac{1}{2}$  in. long,  $\frac{3}{4}$ –1 in. broad, much imbricated, with a lemon-yellow corona more than half as long as the segments. *N. tridymus* Hort. bears 2–3 flowers, like those of *Nelsoni*, but the tube is rather more obconic. *N. Bernardi* Henon (*Diomedes Parkinsoni* Haw.) has an orange or lemon-yellow more plicate corona half as long as the spreading white segments.

Hab. *Macleaii* was received by Alexander Macleay, Esq., from France in 1819. *Bernardi* is wild in the South of France, and has been imported alive lately into English gardens by the Hon. Mrs. Barton from the Pyrenees. These forms connect *incomparabilis* var. *albus* with *bicolor*. A form very like *Bernardi*, figured Bot. Reg. vol. xxix. tab. 38, was produced by Herbert by crossing *Pseudo-narcissus* and *poeticus*.

21. *N. JUNCIFOLIO-MUTICUS* Baker. — Leaves subterete, bright green,  $\frac{1}{8}$  in. broad, deeply channelled down the face. Peduncle slender, terete. Umbel 2–3-flowered; pedicels 1–1 $\frac{1}{2}$  in. long. Perianth-tube cylindrical, greenish yellow,  $\frac{5}{8}$  in. long; segments ovate-oblong, spreading, lemon-yellow,  $\frac{1}{2}$ – $\frac{5}{8}$  in. long, nearly  $\frac{1}{2}$  in. broad; corona obconic, orange-yellow,  $\frac{1}{2}$  in. long, above  $\frac{1}{2}$  in. diam. at the truncate erect throat. Style reaching halfway up the corona.

Hab. Gathered in the Pyrenees, in April, 1886, by E. W. Buxton, Esq., growing with its parents. A probable hybrid between *juncifolius* and *triandrus* was exhibited by Mr. Geo. Maw at the Linnean Society in February, 1887.

22. *N. POCULIFORMIS* Salisb. Prodr. 224; Burbidge, t. 16. *N. montanus* Ker in Bot. Reg. t. 123. Genus *Tros* Haw. *Cydenis* Salisb. — Bulb 1–1 $\frac{1}{2}$  in. diam. Leaves about 4, linear, glaucous, a foot long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad. Peduncle angled, a foot or more long, 1–2-flowered; spathe 1–1 $\frac{1}{2}$  in. long; pedicels cernuous, shorter than the spathe. Flower fragrant, pure white; tube green, subcylindrical,  $\frac{3}{4}$  in. long; segments spreading, oblong, an inch long, rather imbricated; corona cup-shaped, half as long as the segments, minutely crenulate at the throat. Stamens biseriate, inserted low down in the tube. Style reaching sometimes to the throat of the corona. *T. galanthifolia* Haw. has less imbricated perianth-segments, with inflexed edges, and a more plicate corona.

Hab. Origin uncertain. Stated by Salisbury to be a native of damp valleys of the Pyrenees. Flowers early in April.

23. *N. LEEDSII* Hort. — Leaf twisted, canaliculate, glaucous,  $\frac{1}{3}$  in. broad. Peduncle 2-edged, longer than the leaf. Flower single, horizontal or rather drooping. Perianth-tube subcylindrical,  $\frac{3}{4}$  in. long; segments spreading, oblong, acute, milk-white,  $1-1\frac{1}{4}$  in. long,  $\frac{1}{2}-\frac{3}{4}$  in. broad; corona cup-shaped, sulphur-yellow,  $\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. diam. at the erect irregularly crenate plicate throat. Style reaching nearly to the throat of the corona, overtopping the anthers.

Hab. Intermediate between *poculiformis* and *incomparabilis*. About fifty forms are distinguished by name by cultivators.

24. *N. BARRII* Hort.; Burbidge, t. 22.— Leaves linear, twisted, glaucous, above a foot long,  $\frac{1}{4}$  in. broad. Peduncle compressed, a foot long. Flower solitary, horizontal or ascending. Perianth-tube subcylindrical,  $\frac{3}{4}-1$  in. long; segments spreading, oblong, acute, sulphur-yellow, slightly imbricated,  $1-1\frac{1}{4}$  in. long,  $\frac{1}{2}-\frac{3}{4}$  in. broad; corona obconic,  $\frac{1}{3}$  in. long, above  $\frac{1}{2}$  in. broad at the erect crenulate plicate throat, lemon-yellow at the base, passing into orange-yellow upwards. Style just overtopping the anthers.

Hab. Covers a series of forms intermediate between *incomparabilis* and *poeticus*, nearer the former than the latter. About fifty forms have been named in cultivation. Burbidge t. 22A, is a cross between *minor* and *poeticus*; t. 22B, between *incomparabilis* and *Pseudo-narcissus*.

25. *N. ORIENTALIS* Linn. Mant. 38; Bot. Mag. t. 948. *Queltia orientalis* Herb. *Hermione ambigua* Salisb. *Schizanthus orientalis* Haw. Genus *Patrocles* Salisb. — Leaves green,  $\frac{1}{3}$  in. broad. Peduncle much compressed. Umbel 3-4-flowered; pedicels long, erect or arcuate. Perianth-tube subcylindrical, green,  $\frac{1}{2}$  in. long; segments spreading, sulphur-yellow, oblong, acute, 1 in. long,  $\frac{1}{2}$  in. broad; corona cup-shaped, one-third the length of the segments, orange-yellow, deeply irregularly 3-lobed; margin erect. Stamens and style not exerted.

Hab. Probably a hybrid between *incomparabilis* and *Tazetta*.

26. *N. BURBIDGEI* Hort. — Leaves linear, glaucous, twisted, above a foot long,  $\frac{1}{3}-\frac{1}{2}$  in. broad. Peduncle above a foot long, 2-edged. Flower solitary, horizontal or drooping. Perianth-tube subcylindrical, green, an inch long; segments spreading horizontally, oblanceolate-oblong, acute, not imbricated, pure white,  $1\frac{1}{4}$  in. long,  $\frac{1}{2}$  in. broad; corona obconic,  $\frac{1}{3}$  in. long,  $\frac{1}{3}$  in. broad, yellow at the base, red at the minutely crenulate plicate throat. Stamens and stigma not exerted from the corona.

Hab. Covers a series of forms between *incomparabilis* and *poeticus*, in which the characters of the latter predominate. About fifty of them are distinguished by names in Mr. Barr's catalogue.

27. *N. TAZETTO-POETICUS* Gren. & Godr. Fl. Franc. iii. 257. *N. biflorus* var. *hybridus* DC. — Near *biflorus*, but flowers 2-5, smaller, with less imbricated segments. Corona sometimes larger, scarcely scarious at the edge and lobed, sometimes scarious, plicate, and tinged with red.

Hab. South of France, in meadows at Grasse and near Montpellier, growing amongst its parents.

3. TAPEINANTHUS *Herb.*(*Tapeinægle* *Herb.*; *Carregnoa* *Boiss.*)

*Perianth*-tube short; segments equal, narrow, spreading; corona nearly obsolete. *Stamens* in two rows at or a little distance below the throat of the perianth-tube; filaments filiform, longer than the versatile anthers. *Ovary* 3-celled, turbinate; ovules many in a cell; style filiform, as long as the stamens; stigma capitate. *Fruit* a small globose capsule dehiscing loculicidally at the apex. *Seeds* oblong, black, shining.

1. *T. HUMILIS* *Herb. Amaryll. 190, 414. Pancratium humile* *Car. Carregnoa lutea* *Boiss. Amaryllis exigua* *Schousb. Lapidra gracillima* *Baker.* — Bulb globose,  $\frac{1}{2}$  in. diam; tunics brown, membranous, produced 1–1 $\frac{1}{2}$  in. above its neck. Leaves 1–3, filiform, 2–3 in. long, produced in November. Peduncle very slender, 2–6 in. long. Flowers 1–2, erect; spathe membranous, tubular at the base. Perianth bright yellow,  $\frac{1}{2}$  in. long; tube very short, funnel-shaped; segments lanceolate. Stamens nearly as long as the perianth-segments; anthers linear-oblong.

*Hab.* Spain and Morocco, very rare. Flowers in October. *Carregnoa dubia* *Willk.*, seems to be, as pointed out by Janka, a form of *Narcissus serotinus*.

4. PLACEA *Miers.*

*Perianth* funnel-shaped, slightly declinate; tube scarcely any; segments oblong, acute, subequal. *Corona* funnel-shaped, membranous, inserted at the base of the segments, deeply cut; divisions emarginate. *Stamens* inserted inside the corona; filaments filiform, declinate, upper 3 shorter; anthers oblong, versatile. *Ovary* turbinate, 3-celled; ovules many, superposed; style filiform, declinate; stigma capitate, faintly 3-lobed. *Capsule* unknown. — *Rootstock* a tunicated bulb. *Leaves* 2–3, linear, contemporary with the flowers in autumn. *Peduncle* long, hollow. *Umbel* many-flowered; spathe-valves 2, lanceolate; pedicels bracteolate. *Flowers* inodorous, white or yellow, striped with red.

1. *P. ORNATA* *Miers in Bot. Reg. xxvii. t. 50.* — Bulb ovoid, 1 in. diam. Leaves 2, linear, as long as the peduncle,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad. Peduncle 6–9 in. long, attenuated upwards. Umbel 4–6-flowered; spathe-valves lanceolate; pedicels slender, 1–3 in. long. Perianth-limb 1–1 $\frac{1}{2}$  in. long; segments  $\frac{1}{2}$  in. broad at the middle, minutely cuspidate, white, with conspicuous stripes of red-purple, distinctly unguiculate. Corona  $\frac{1}{3}$ – $\frac{1}{6}$  in. long. Stamens half as long as the limb; filaments red-purple. Style nearly as long as the limb.

*Hab.* Chili; Valley of Aconagua, *Miers!* *Reed!* Santiago, *Philippi!*

2. *P. GRANDIFLORA* *Lemaire in Ill. Hort. t. 574.* — Bulb above 1 in. diam.; neck short. Leaves 3, linear, 1 $\frac{1}{2}$  ft. long, very acuminate. Peduncle 1 $\frac{1}{2}$  ft. long. Umbel 6–8-flowered; spathe-valves lanceolate, 1 $\frac{1}{2}$  in. long, tinged with red; pedicels 1 $\frac{1}{2}$ –2 in. long. Perianth-limb 2 in. long; segments oblong, acute, white, with bright red stripes,  $\frac{1}{2}$  in. broad. Corona  $\frac{1}{6}$  in. long, red-purple; segments emarginate. Stamens half as long as the perianth.

Hab. Valparaiso. Introduced into cultivation by Verschaffelt in 1867; received from M. Jules Grisar, Belgian Consul at Valparaiso.

3. *P. ARZÆ* Philippi, Descr. Nuev. Plant. 1872, 65. — Bulb  $2\frac{1}{2}$  in. diam. Leaves 2, linear, glaucous, under a foot long,  $\frac{1}{8}$  in. broad. Peduncle  $1\frac{1}{2}$  ft. long. Umbel 3–5-flowered; spathe-valves purple,  $1\frac{1}{2}$  in. long; pedicels slender, as long as the spathe. Perianth-limb  $1\frac{3}{4}$ –2 in. long; segments  $\frac{1}{2}$  in. broad, pale yellow, tinged and conspicuously striped with claret-purple. Corona  $\frac{1}{8}$  in. long; segments quadrate, united in the lower half. Stamens half as long as the limb.

Hab. Chili; Province of Santiago, *Philippi*, *Reed*! May be the same as *P. grandiflora*.

4. *P. LUTEA* Philippi in Linnæa, xxxii. 259. — Leaves 2, glaucous, as long as the peduncle,  $\frac{1}{8}$  in. broad. Peduncle glaucous. Umbel 3–12-flowered. Perianth-segments bright yellow, veined with purple at the base, above an inch long. Corona cup-shaped, with 6 ribs ending in small cusps. Lower 3 stamens as long as the perianth. Style longer than the stamens.

Hab. Chili; Mount Alto de Catemn, Province of Aconagua, *Philippi*.

5. *P. GERMAINII* Philippi in Linnæa, xxix. 67. — Leaves unknown. Peduncle  $1\frac{1}{2}$  ft. long. Umbel 5-flowered; pedicels  $1\frac{1}{2}$  in. long, a little exceeding the spathe-valves. Perianth  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long; segments  $\frac{1}{3}$  in. broad, purple at the base, yellow upwards, with purple dots. Corona one-fourth as long as the segments, 6-lobed. Stamens half as long as the perianth.

Hab. Chili; Mount Campana de Quillota, *Germain*.

## Tribe 2.—AMARYLLIÆ GENUINÆ.

### 5. GALANTHUS Linn.

*Perianth*-tube none; segments dimorphic; outer oblong-spathulate; inner much shorter, obovate, emarginate, stiffly erect. *Stamens* epigynous; filaments very short; anthers basifixed, lanceolate, usually acuminate, hidden by the inner segments. *Ovary* globose, 3-celled: ovules many in a cell, superposed; style filiform, longer than the stamens; stigma capitate, minute. *Fruit* finally loculicidally 3-valved. *Seeds* ellipsoid, strophiolate; testa pale, thin. — *Rootstock* a tunicated bulb, one tunic wrapped tightly round the base of the stem and leaves. *Leaves* 2–3, lorate. *Peduncle* solid. *Flower* solitary, cernuous; spathe usually simple.

Leaves simply channelled down the face.

Vernal . . . . . Sp. 1–4.

Autumnal . . . . . Sp. 5.

Edges of the leaf reduplicate . . . . . Sp. 6.

1. *G. NIVALIS* Linn. Sp. Pl. 413; Engl. Bot. t. 19; Red. Lil. t. 200. — Bulb globose,  $\frac{1}{2}$ –1 in. diam.; basal sheath truncate, 2–3 in. long, slit down one side. Leaves linear, glaucous, finally 6–9 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad, simply channelled down the face.

Peduncle 3–12 in. long; spathe green, with a hyaline edge. Outer perianth-segments oblong,  $\frac{1}{2}$ –1 in. long; inner half as long, obovate-cuneate, deeply emarginate, with only a green patch round the sinus. Anthers lanceolate,  $\frac{1}{4}$  in. long, gradually acuminate. *G. reflexus* Herb., from Mount Gargarus, has flowers much smaller than in the type, and inner segments reflexed at the apex. Var. *lutescens* Hort. has a yellowish ovary, and inner segments tipped with yellow instead of green. Var. *poculiformis* Hort. has the inner segments plain white, and nearly as long as the outer. *G. Scharloki* Caspary has two long herbaceous spathe-valves, sometimes two flowers, and a green spot at the tip of each outer segment. *G. coreyrensis* (*præcox*) Hort., from Corfu, flowers in December. *G. octobrensis* Hort., brought by Lord Walsingham to the late Rev. Harpur Crewe, from Albania, flowers in England at the end of October.

Subsp. *G. IMPERATI* Bertol. Fl. Ital. iv. 5. *G. plicatus* Tenore, non M. B. *G. Clusii* Fisch. — Leaves broader than in the type, and flowers larger. Outer segments 1–1 $\frac{1}{4}$  in. long, more spathulate and narrower at the base than in the type. — Naples and Genoa. Figured by Matthioli in 1575, and received by Clusius from Byzantium in 1582. Var. *Melvillei* Hort. scarcely differs.

Subsp. *G. CAUCASICUS* Baker in Gard. Chron. 1887, i. 312. — Leaves broader than in the type, finally 8–9 in. long,  $\frac{3}{4}$  in. broad. Petals usually  $\frac{3}{4}$ –1 in. long, oblong-spathulate, with a very narrow claw.—Caucasus only. Flowers later than the type. Includes *G. nivalis*, vars. *Redontei*, *major*, and *caspicus* of Ruprecht. Often confounded with *G. plicatus*, but the edge of the leaf is not recurved. Var. *virescens* Hort. is apparently a form of this, with the outer segments flushed with green on the outside.

Hab. Extends through Southern and Central Europe from the Pyrenees to the Caucasus. Flowers in February and March.

2. *G. GRÆCUS* Orph.; Boiss. Fl. Orient. v. 145. — Very near *G. Elwesii*, but the flower smaller, with narrower outer segments, and the apical lobes of the inner segments not spreading nor crisped.

Hab. Isle of Chios, on Mount Pellinos, alt. 3800 ft., flowering in April, *Orphanides*.

3. *G. ELWESII* Hook. fil. in Bot. Mag. t. 6166. — Bulb larger than in *nivalis*; sheath 1–3 in. long. Leaves very glaucous, broader than in *nivalis*, simply channelled down the face. Flower more globose than in *nivalis*; outer segments oblong-spathulate,  $\frac{3}{4}$ –1 $\frac{1}{4}$  in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad; inner dark green in the lower half and also round the sinus; lobes square, rather spreading and crisped. Anthers  $\frac{1}{4}$  in. long, narrowed gradually from the base to the apex. Capsule rather turbinate.

Hab. Mountains of Asia Minor, 2000–5000 ft., flowering with us in February. Gathered by Ba'ansa in 1854, but first individualised by Mr. Elwes in 1875. *G. globosus* Wilks in Garden, 1887, i. 393, with woodcut, from Smyrna, is a form with very broad outer segments, globose perianth-limb, and frequently two flowers.

4. *G. LATIFOLIUS* Ruprecht in Regel Gartenfl. 1868, 130, t. 578, fig. 1; Gard. Chron. 1879, fig. 32 c; 1881, 404, fig. 80. — Bulb

1 in. diam.; sheath short, truncate. Leaves lorate, bright green,  $\frac{3}{4}$ –1 in. broad, simply channelled down the centre. Outer segments oblong-spathulate,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; inner with only a green patch round the sinus both inside and outside. Anthers narrowed suddenly to an acute point.

Hab. Caucasus, flowering with us in February and March, in its native home in May, alt. 6000–8000 ft.

5. *G. OLGÆ* Orph.; Boiss. Fl. Orient. v. 146. — Leaves 6–8 in. long,  $\frac{1}{4}$  in. broad, simply channelled, glaucous, especially beneath. Outer segments of the perianth oblong-unguiculate, about an inch long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad; inner half as long, plain white, with rounded lobes. Anthers lanceolate-acuminate.

Hab. Greece; Mount Taygetus, flowering in October, *Orphanides* 4017.

6. *G. Plicatus* M. B. Fl. Taur. Cauc. iii. 255; Bot. Mag. t. 2162; Bot. Reg. t. 545. *G. latifolius* Salisb.—Bulb larger than in *nivalis*. Leaves very glaucous, finally a foot long, an inch broad, broadly channelled down the face, and the edges reduplicate. Outer perianth-segments oblong from a very narrow base, very convex on the back,  $\frac{3}{4}$ –1 in. long, widely spreading or even reflexed; inner deeply emarginate, green in the upper half, with a white edge. Anthers lanceolate-acuminate,  $\frac{1}{4}$  in. long.

Hab. Mountains of the Crimea and Dobruscha, flowering with us in March and April. The Caucasian plant, often called *plicatus*, is *nivalis* subsp. *caucasicus*.

## 6. LEUCOJUM Linn.\*

*Perianth-tube* none; segments uniform, ovate or oblong, spreading. *Stamens* epigynous; filaments filiform, shorter than the linear-oblong basifixed anthers. *Ovary* 3-celled; ovules many in a cell, superposed; style filiform or strumose near the apex: stigma minute, capitate. *Fruit* finally dehiscing loculicidally into three valves from the top. *Seeds* subglobose; testa usually black. *Rootstock* a bulk, with membranous tunics. *Leaves* slender or lorate. *Flowers* one or several in an umbel, white, tinged with red or green; spathe-valves usually single.

Leaves lorate. Style strumose near the tip.

Subgenus *Euleucojum*. Seeds with a black crustaceous testa and no strophiole . . . . . Sp. 1–2.

Subgenus *Erinosma*. Seeds with a membranous pale testa and conspicuous strophiole . . . . . Sp. 3.

Leaves filiform or narrow linear. Style filiform.

Subgenus *Acis*. Epigynous disk not lobed.

Vernal . . . . . Sp. 4–6.

Autumnal . . . . . Sp. 7–8.

Subgenus *Ruminia*. Epigynous disk with 6 quadrate lobes at the edge . . . . . Sp. 9.

\* See Baker in Gard. Chron. 1879, i. 399.

## Subgenus EULEUCOJUM.

1. *L. ÆSTIVUM* Linn. Sp. Pl. 414; Engl. Bot. t. 621; Bot. Mag. t. 1210; Red. Lil. t. 135. *Nivaria æstivalis* Mœnch. — Bulb ovoid, 1–1½ in. diam. Leaves lorate, obtuse, green, 1–1½ ft. long, about ½ in. broad. Peduncle ancipitous, hollow, about a foot long. Umbel 4–8-flowered; spathe lanceolate, 1-valved, 1½–2 in. long; pedicels long, cernuous. Perianth-segments broad-oblong, ½–¾ in. long, white, tipped with green. Stamens half as long as the limb; anthers longer than the filaments. Style longer than the stamens, green, and slightly strumose towards the tip. Capsule subglobose, ¾ in. diam. Seeds with a thick black shining crustaceous testa.

Hab. Central and Southern Europe from Britain and France to the Crimea and Armeria. Flowers with us at the end of April and beginning of May.

2. *L. PULCHELLUM* Salisb. Parad. t. 74. *L. Hernandezii* Cambes. — Differs from the last by its smaller flowers and capsule, and narrower leaves, and flowers a fortnight earlier.

Hab. Sardinia and Balearic Isles.

## Subgenus ERINOSMA.

3. *L. VERNUM* Linn. Sp. Pl. 414; Bot. Mag. t. 46; Jacq. Austr. t. 312. *Erinosma verum* Herb. — Bulb globose, ¾–1 in. diam.; outer tunics thin, pale green. Leaves 3–4, lorate, ⅓–½ in. broad, finally 6–9 in. long. Peduncle 2-edged, hollow, ½–1 ft. long, usually 1-flowered; spathe single, lanceolate; pedicel cernuous, about as long as the ovary. Ovary turbinate; perianth-segments white, tipped with green, broad-oblong, ¾ in. long. Stamens half as long as the perianth-limb; filament much shorter than the anther. Style clavate below the apex. Capsule green, turbinate, ½ in. diam. Seeds with a thin testa and small strophiole. *E. carpathicum* Herb. (Bot. Mag. t. 1993) is a form with the perianth-segments tipped with yellow instead of green. Var. *Vagneri* Stapf. is a tall robust form with two flowers.

Hab. Throughout Central Europe from France to Bosnia and the Tyrol. Flowers early in March.

## Subgenus ACIS.

4. *L. TRICOPHYLLUM* Schonsb. Marok. 154; Reich. Ic. Crit. t. 703; Gawl. in Bot. Reg. t. 544. *L. autumnale* Desf. in part. *Acis trichophylla* Herb. *A. Broteri* Jord. et Four. Ic. t. 64, fig. 105. — Bulb ovoid, ½–¾ in. diam.; tunics pale brown. Leaves about 3, filiform, as long as the stem, contemporary with the flowers. Peduncle very slender, ½–1 ft. long; flowers 2–4; spathe-valves 2, lanceolate; pedicels long, cernuous. Perianth-limb white, ⅓–¾ in. long; segments oblanceolate-oblong, laxly 7-nerved. Stamens ⅓ in. long; filaments very short. Capsule turbinate, ½ in. diam.

VAR. *L. GRANDIFLORUM* DC. in Red. Lil. t. 217. *Acis grandiflora* Sweet. — Perianth-limb ¾–1 in. long.

Hab. Spain, Portugal, Morocco and Algiers. Flowers in April.

5. *L. TINGITANUM* Baker in Journ. Linn. Soc. xvi. 678.—Closely allied to *L. trichophyllum*. Leaves narrow-linear, a foot long, contemporary with the flowers. Peduncle much stouter than in *trichophyllum*, 1-1½ ft. long; flowers 5-6; spathe-valves 2, lanceolate, membranous. Perianth-limb white,  $\frac{1}{2}$ - $\frac{3}{8}$  in. long; segments oblanceolate. Stamens  $\frac{1}{4}$  in. long; filament shorter than the anther.

Hab. Marocco, near Tangier, *Blackmore!* Vernal.

6. *L. LONGIFOLIUM* J. Gay; Gren. & Godr. Fl. France, iii. 252. *Acis longifolia* Roem.; Jord. et Four. Ic. t. 65, fig. 107.—Bulb ovoid,  $\frac{1}{2}$  in. diam.; tunics thin, pale brown. Leaves 2-3, filiform, very slender, flaccid, longer than the stem,  $\frac{1}{2}$ -1 ft. long. Peduncle very slender, 3-6 in. long; flowers 1-3; spathe-valves 2, linear; pedicels short. Perianth-limb white,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long; segments oblanceolate, 5-nerved. Stamens  $\frac{1}{3}$  in. long; filaments very short.

Hab. Mountains of Corsica, alt. 4500-6000 ft. Flowers in April and May.

7. *L. AUTUMNALE* Linn. Sp. Pl. 414; Bot. Mag. t. 960; Salisb. Parad. t. 21. *Acis autumnalis* Salisb. *A. oporantha* and *pulchella* Jord. et Four. Ic. t. 64.—Bulb globose,  $\frac{1}{2}$  in. diam.; tunics thin, pale brown, produced 1-2 in. above its neck. Leaves filiform, very slender, usually produced after the flowers. Peduncle very slender, 3-9 in. long; flowers 1-3; spathe-valve linear, single; pedicels longer than the spathe, cernuous. Perianth-limb  $\frac{1}{3}$ - $\frac{1}{2}$  in. long, white, tinged with red; segments oblanceolate-oblong, laxly 5-7-nerved. Stamens half as long as the limb; filaments very short. Capsule globose,  $\frac{1}{6}$  in. diam. *A. cephalonica* Gay is a form with a 2-valved spathe. *A. pulchella* Jord. et Four., from Algeria, has large pendulous flowers, and leaves produced with the flowers.

Hab. Portugal and Marocco to the Ionian Islands. Flowers in autumn.

8. *L. ROSEUM* Martin in Bibl. Physic. 1804, 344; Reich. Ic. t. 944-946; Pl. Crit. t. 704. *Acis rosea* Sweet, Brit. Flow. Gard. t. 297.—Bulb globose,  $\frac{1}{4}$ - $\frac{1}{2}$  in. diam.; tunics pale. Leaves filiform, produced after the flower. Peduncle very slender, 2-4 in. long; flower usually solitary, cernuous; spathe-valves 2, small; pedicel very short. Perianth-limb  $\frac{1}{3}$  in. long, rose-red; segments oblanceolate. Stamens  $\frac{1}{6}$  in. long; filaments very short. Capsule very small, globose.

Hab. Mountains of Corsica. Flowers in September and October.

#### Subgenus RUMINIA.

9. *L. HYEMALE* DC. Fl. Franc. Suppl. 326; Baker in Bot. Mag. t. 6711. *L. nicaense* Ard. *Acis hiemalis* Roem. *Ruminia hiemalis* Parl. *R. nicaensis* Jord. et Four. Ic. t. 65, fig. 108.—Bulb globose,  $\frac{1}{2}$  in. diam.; tunics brown. Leaves 2-4, narrow-linear, contemporary with the flowers, finally a foot long. Peduncle 4-6 in. long; flower usually solitary; spathe 2-valved; pedicel short, cernuous. Perianth-limb  $\frac{1}{3}$ - $\frac{1}{2}$  in. long, white, tinged with green outside; segments oblong. Anthers  $\frac{1}{6}$  in. long; filaments scarcely any. Ovary with the disc produced into 6 minute scales. Capsule depresso-globose,  $\frac{1}{3}$  in. diam.

Hab. Coast-rocks at Nice, Mentone, and Villafranca. Flowers in April, hence the name *hyemale* is misleading.

### 7. LAPIEDRA *Lagas.*

*Perianth*-tube none; segments lanceolate, subequal, spreading, persistent. *Stamens* epigynous; filaments filiform; anthers lanceolate, deeply sagittate at the base, erect. *Ovary* 3-celled; ovules several in a cell, superposed; style filiform; stigma simple. *Capsule* small, deeply lobed, loculicidally 3-valved. *Seeds* 1-2 in a cell, turgid, with a shining black crustaceous testa.—Monotypic.

1. *L. MARTINEZII* Lag. Eleuch. 14; Boiss. Voy. t. 171. *L. Placiana* Herb. *Crinum Martinezii* Spreng. — Bulb ovoid, 2 in. diam., with a long neck. Leaves 2, lorate, developed after the flowers, keeled with white. Scape slender, ancipitous,  $\frac{1}{2}$  ft. long. Umbel 4-8-flowered; spathe-valves 2, membranous, linear; pedicels longer than the flowers. *Perianth*-limb  $\frac{1}{3}$  in. long; segments white, with a broad green keel. Stamens and style shorter than the segments. Capsule  $\frac{1}{4}$  in. diam., with 3 round lobes.

Hab. South of Spain, flowering in September. Noticed by Clusius (1576) and Barrelier (1714).

### 8. HESSEA *Herb.*

*Perianth* cut down nearly or quite to the ovary; segments subequal, oblanceolate or oblong, obtuse, spreading, 3-nerved down the keel. *Stamens* inserted at the base of the perianth-segments; filaments filiform or flattened towards the base; anthers small, globose, basifixed. *Ovary* globose, 3-celled; ovules few in a cell; style subulate throughout or dilated at the base; stigma tricuspidate. *Capsule* globose, membranous, deeply lobed, loculicidally 3-valved. *Seeds* globose, green. — *Rootstock* a bulb, with membranous tunics. *Leaves* generally produced after the flowers, filiform, linear or lorate. *Umbels* many-flowered; pedicels long; spathe-valves 2; flowers small, reddish white.

Subgenus *Hessia proper*. Style not dilated at the base.

Stamens much shorter than the oblong perianth-segments . . . . .	Sp. 1-2.
Stamens nearly or quite as long as the oblong-lanceolate perianth-segments . . . . .	Sp. 3-5.

Subgenus *Imhofia*. Style ovoid or conic at the base.

Leaves filiform . . . . .	Sp. 6-7.
Leaves lorate . . . . .	Sp. 8.

1. *H. STELLARIS* Herb. Amaryll. 289. *Amaryllis stellaris* Jacq. Hort. Schoen. t. 71. *Strumaria stellaris* Gawl. — Bulb globose,  $\frac{3}{4}$ -1 in. diam.; neck 1-2 in. long. Leaves lorate, produced after the flowers,  $\frac{1}{2}$ -1 ft. long. Peduncle 3-9 in. long. Flowers 6-30 in an umbel; pedicels 1-2 in. long; spathe-valves lanceolate. *Perianth*-tube scarcely any; segments oblong, crisped, red at the

throat. Stamens about half as long as the limb. Style subulate; stigmas recurved. Capsule  $\frac{1}{4}$  in. diam.

Hab. Cape Colony; South-western provinces.

2. *H. CRISPA* Kunth, Enum. v. 632, ex parte. *Amaryllis crispa* Jacq. Hort. Schoen. t. 72. *Strumaria crispa* Ker in Bot. Reg. t. 1383. *Imhofia crispa* Herb. *Amaryllis cinnamomea* L'Herit. Sert. t. 18.—Habit and flowers of *H. stellaris*, from which it only differs by its stouter rather strumose style.

Hab. Cape Colony; South-western provinces. Doubtfully distinct from *H. stellaris*.

3. *H. DREGEANA* Kunth, Enum. v. 633.—Bulb globose, with a mass of tunics produced  $1\frac{1}{2}$  in. above its neck. Leaves 2, lorate, with a long truncate basal sheath. Peduncle 3–4 in. long; flowers 20–30 in an umbel; pedicels  $1\frac{1}{2}$  in. long; spathe-valves 2, green, lanceolate. Perianth-tube scarcely any; segments oblanceolate,  $\frac{1}{4}$  in. long, reddish white. Stamens about as long as the limb. Style as long as the stamens, cylindrical, stouter towards the base.

Hab. Cape Colony; Province of Clanwilliam, *Drège 252 b*!

4. *H. REHMANNI* Baker. — Bulb globose, under 1 in. diam.; neck an inch long. Leaves subterete, shorter than the peduncle. Peduncle slender, subterete, 4–8 in. long. Flowers 8–12 in an umbel; pedicels strongly angled,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; spathe-valves small, ovate or ovate-lanceolate. Perianth-tube scarcely any; segments oblanceolate, pale, much crisped. Stamens as long as the limb. Style not strumose.

Hab. Transvaal, *Rehmann 6549*!

5. *H. ZEYHERI* Baker. — Bulb globose; neck  $1\frac{1}{2}$ –2 in. long. Leaves linear, glabrous, a foot long. Peduncle stout, 4–8 in. long. Flowers 20–30 in an umbel; pedicels 2–2 $\frac{1}{2}$  in. long; spathe-valves lanceolate, green. Perianth  $\frac{1}{3}$  in. long, purplish white; tube short; segments oblanceolate, scarcely crisped. Stamens nearly as long as the limb. Style as long as the limb, slender down to the base.

Hab. Cape Colony; Province of Uitenhage, *Zeyher 1661*!

#### Subgenus IMHOFIA.

6. *H. FILIFOLIA* Benth. Gen. Plant. iii, 721. *Imhofia filifolia* Herb. *Strumaria filifolia* Jacq. Ic. t. 361; Bot. Reg. t. 440. *Leucocjum strumosum* Thunb. *Crinum tenellum* Linn. fil. — Bulb globose,  $\frac{1}{2}$  in. diam.; neck slender, an inch long. Leaves filiform, contemporary with the flowers. Peduncle very slender, not spirally-twisted, 3–6 in. long. Umbel 4–12-flowered; pedicels slender,  $\frac{1}{2}$ –2 in. long; spathe-valves small, linear. Perianth reddish white,  $\frac{1}{4}$  in. long; tube none; segments oblanceolate, not crisped. Stamens rather shorter than the limb. Style subulate from an ovoid base. Capsule  $\frac{1}{8}$  in. diam., deeply 3-lobed.

Hab. Cape Colony; South-western provinces.

7. *H. SPIRALIS* Baker. — Very near *H. filifolia*, from which it

differs by its spirally-twisted stem, longer stouter pedicels, and longer spathe-valves.

Hab. Cape Colony; Province of Uitenhage, Zeyher 1662!

8. *H. GEMMATA* Benth. Gen. Plant. iii. 721. *Strumaria gemmata* Ker in Bot. Mag. t. 1620. *Imhofia gemmata* and *Burchelliana* Herb. l. *Bergiana* Kunth.—Bulb globose, 1 in. diam.; neck 1–2 in. long. Leaves lorate, developed after the flowers,  $\frac{1}{2}$  ft. long, ciliated with long fine hairs. Peduncle  $\frac{1}{2}$ –1 ft. long. Umbel 10–20-flowered; pedicels 1–3 in. long; spathe-valves lanceolate. Perianth purplish white,  $\frac{1}{3}$  in. long; tube none; segments oblanceolate, crisped. Stamens nearly as long as the limb. Style stout, cylindrical from a conical base. Capsule  $\frac{1}{4}$  in. diam.

Hab. Cape Colony; South-eastern and Central provinces, ascending to 5000 ft. on the Sneewbergen.

### 9. CARPOLYZA *Salisb.*

*Perianth* with a short funnel-shaped tube; segments linear-oblong, subequal, spreading. *Stamens* inserted in the perianth-tube; filaments short, filiform; anthers subglobose, minute, basifixed. *Ovary* globose, 3-celled; ovules few in a cell; style filiform; stigma tricuspidate. *Capsule* globose, membranous, loculicidally 3-valved. *Seeds* few in a cell, subglobose, green.—Monotypic.

1. *C. SPIRALIS* Salisb. Parad. t. 63. *Strumaria spiralis* Ait.; Bot. Mag. t. 1383. *Hamanthus spiralis* Thunb. *Crinum tenellum* Jacq. Ic. t. 363. *C. spirale* Andr. Bot. Rep. t. 92. — Bulb ovoid,  $\frac{1}{4}$ – $\frac{1}{3}$  in. diam., with a long slender neck; tunics membranous. Leaves 2–4, contemporary with the flowers in June, subulate, very slender. Peduncle filiform, spirally-twisted, 2–4 in. long; spathe-valves 2, linear. Perianth funnel-shaped, pinkish white; tube  $\frac{1}{8}$ – $\frac{1}{6}$  in. long; segments  $\frac{1}{2}$  in. long. Capsule  $\frac{1}{4}$  in. diam., with 3 rounded lobes.

Hab. Cape Colony; South-western provinces only.

### 10. GETHYLLIS *Linn.\**

*Perianth* hypocrateriform; tube long, cylindrical; segments subequal, oblong, acute. *Stamens* 6 or many in 6 clusters inserted in a single row at the throat of the tube; filaments short; anthers linear, basifixed, soon curling up when the flower opens. *Ovary* 3-celled; ovules many, superposed; style long, filiform; stigma capitate. *Fruit* succulent, clavate, indehiscent. *Seeds* globose, immersed in pulp; testa loose, hyaline.—*Rootstock* a tunicated bulb. *Peduncle* short, hypogeous. *Spathe* monophyllous, membranous. *Leaves* produced after the flowers, filiform, linear or lanceolate. *Flowers* whitish, fugitive. *Habit* of *Crocus*.

Stamens six, undivided . . . . . Sp. 1–4.  
Stamens numerous, but arranged in six bundles . . . . . Sp. 5–9.

\* See my fuller Synopsis in the 'Journal of Botany,' 1885, p. 225, with two plates. Masson's drawings, recently discovered, have added very materially to our knowledge of the species.

1. *G. SPIRALIS* Linn. fil. Suppl. 198; Bot. Mag. t. 1088. *Papiria spiralis* Thunb. — Bulb globose, 1–1½ in. diam.; neck 1–2 in. long. Leaves 4–6, subulate or linear-subulate, spirally-twisted, glabrous, produced after the flowers. Perianth-tube 2–3 in. long; limb 1–1½ in. long, white, tinged red on the outside; segments oblong-lanceolate, ¼–⅓ in. broad. Stamens 6, about 1½ in. long; filaments as long as the anthers. Style just overtopping the stamens. Fruit clavate, 2–3 in. long, under ½ in. diam. *G. rosea* Ecklon is a form with small flowers, tinged red on the outside.

Hab. Cape Colony; South-western provinces. Flowers in December, and fruits in February.

2. *G. VERTICILLATA* R. Br. Prodr. 290; Baker in Journ. Bot. 1885, 226, tab. 259, fig. 2. — Bulb small, ovoid, with a purple-spotted cylindrical neck 1½–2 in. long. Leaves 4–5, narrow-linear, glabrous, circinate. Perianth-tube 3–4 in. long; limb white, an inch long; segments lanceolate, acute. Stamens 6; filaments filiform, as long as the anthers. Style just overtopping the stamens. Fruit yellow, clavate.

Hab. Cape Colony. Described from a drawing and specimen of a plant collected by Masson at Piquet Bay in 1790.

3. *G. VILLOSA* Linn. fil. Suppl. 198. *Papiria villosa* Thunb. — Bulb small, ovoid; neck 1–1½ in. long. Leaves 5–10, produced after the flower, linear, ⅙ in. broad, densely stiffly hairy. Perianth-tube pilose, 2–4 in. long; limb about an inch long, tinged outside with pink; segments lanceolate, ⅙ in. broad. Stamens one-third the length of the perianth-limb. Style straight, reaching to the tip of the anthers. Fruit clavate, yellow, 2 in. long, ⅓ in. diam.

Hab. Cape Colony; South-western provinces, *Thunberg!* *Masson!*

4. *G. LONGISTYLA* Bolus in Journ. Linn. Soc. xviii. 396. — Bulb ovoid or subglobose, with a long neck. Leaves 12–18, linear, 3–4 in. long, covered with linear white lacerated centrally-fixed scales. Perianth-tube 2 in. long; limb an inch long; segments oblong-lanceolate, ¼ in. broad. Stamens 6, about half as long as the limb. Style exerted ½ in. beyond the tip of the segments, attenuated upwards.

Hab. Cape Colony; Sneewbergen range, discovered by Mr. Tyson (*Bolus* 842).

5. *G. AFRA* Linn. Sp. Pl. 633; Lindl. Bot. Reg. t. 1016. — Bulb globose, 1½–2 in. diam.; neck 2–3 in. long. Leaves 12–20, linear, twisted, glabrous, strongly ribbed. Perianth-tube 3–4 in. long; limb whitish, 1½–2 in. long; segments oblong or oblanceolate-oblong, ½–¾ in. broad. Stamens 9–12, about ½ in. long; anthers as long as the filaments. Style just overtopping the anthers. Fruit yellow, clavate.

Hab. Cape Colony; Southern provinces, *Burchell* 7209! *Zeyher* 1663! A plant that flowered at Kew, August, 1887, had the 6 stamens variously broken up into 2, 3, or 4, and the segments much flushed with red outside.

6. *G. BRITTENIANA* Baker in Journ. Bot. 1885, 227, tab. 260. — Bulb subglobose, 2–3 in. diam., with a purple-spotted neck 1½ in. long. Leaves 12–15, linear, glabrous, spirally-twisted. Perianth-tube stout for the genus, 2–3 in. long; limb pure white, 2 in. long;

segments oblong-lanceolate,  $\frac{3}{4}$  in. broad. Stamens very numerous, arranged in six clusters,  $\frac{1}{2}$  in. long. Style not overtopping the stamens.

Hab. Cape Colony. Described from three sketches by Masson of a plant marked "Karoo, Sept. 1793." May be an extreme form of *G. afra*.

7. *G. CILIARIS* Linn. fil. Suppl. 198; Jacq. Hort. Schoen. i. 41, t. 79. — Bulb globose,  $1\frac{1}{2}$  in. diam.; neck cylindrical, sometimes 4–5 in. long. Leaves 20 or more, produced after the flowers, linear, spirally-twisted, conspicuously ciliated. Perianth-tube 2–3 in. long; limb whitish,  $1\frac{1}{2}$  in. long; segments oblong-lanceolate,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad. Anthers linear, very numerous,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; filaments very short. Fruit clavate, 2–3 in. long.

Hab. Cape Colony; Southern provinces, *Thunberg!* *Masson!* A full original description by Solander, under the name of *G. polyanthera*, is reprinted by Mr. Britten in Journ. Bot. 1884, p. 148. There is a plant in Thunberg's herbarium labelled "*G. cuspidata*," without leaves, in which four of the six filaments bear two anthers, and the others one each.

8. *G. UNDULATA* Herb. Amaryll. 186, tab. 25, fig. 5. — Bulb globose, 2–3 in. diam.; neck cylindrical, 2–3 in. long. Leaves 12–20, lanceolate, spreading or close, much undulated, 5–6 in. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad. Perianth-tube stout, 2–3 in. long; limb pure white,  $1\frac{1}{2}$  in. long; segments oblong-lanceolate. Stamens numerous; filaments short. Style scarcely overtopping the stamens.

Hab. Cape Colony. Described from Masson's specimen and drawings marked "Zee Koe Valley, March, 1794."

9. *G. LATIFOLIA* MASSON; Baker in Journ. Bot. 1885, 228, tab. 259, fig. 1. — Bulb globose,  $1\frac{1}{2}$  in. diam.; neck cylindrical, sometimes 8–9 in. long. Leaves 10–12, spreading, lorate, twisted, glabrous, 4–5 in. long,  $\frac{1}{2}$  in. broad. Perianth-tube stout, 2–3 in. long; limb tinged pink on the outside, 2 in. long; segments oblong-lanceolate, acute,  $\frac{1}{2}$  in. broad. Stamens about 20, all distinct,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; filaments as long as the anthers.

Hab. Cape Colony. Described from a drawing of Masson's, made Feb., 1794, not localised.

### 11. APODOLIRION *Baker*.

*Perianth* funnel-shaped, with a long cylindrical tube dilated at the apex, and 6 subequal ascending oblong-lanceolate or lanceolate segments. *Stamens* inserted in two rows near the throat of the tube; filaments filiform, about as long as the linear erect basifixed anthers, which soon curl up. *Ovary* 3-celled; ovules many, superposed; style filiform; stigma capitate, obscurely lobed. *Fruit* and *seeds* unknown. — *Rootstock* a tunicated bulb. *Peduncle* short, 1-flowered, hidden in the bulb-neck, as in *Crocus* and *Gethyllis*. *Leaves* narrow, not usually produced with the flowers. *Spathe* membranous, cylindrical. *Flowers* about as large as those of a *Crocus*, white or reddish.

Perianth-tube comparatively short . . . . .	Sp. 1–2.
Perianth-tube 2–4 in. long . . . . .	Sp. 3–5.
Perianth-tube 6–8 in. long . . . . .	Sp. 6 .

1. *A. LANCEOLATUM* Benth. Gen. Plant. iii. 722. *Gethyllis lanceolata* Linn. fil. *Papiria lanceolata* Thunb. — Bulb small, globose; neck  $1-1\frac{1}{2}$  in. long. Leaf solitary, lanceolate, contemporary with the flower,  $1\frac{1}{2}-2$  in. long, moderately firm in texture, crisped at the edge. Perianth-tube an inch long; limb whitish,  $\frac{3}{4}-1$  in. long; segments lanceolate, acute,  $\frac{1}{8}$  in. broad. Anthers  $\frac{1}{8}$  in. long.

Hab. Cape Colony; South-western provinces, very rare, *Thunberg!* *Harvey!*

2. *A. ETTE* Baker. — Bulb not seen; neck cylindrical, an inch long,  $\frac{1}{3}$  in. diam. Leaves unknown. Peduncle and spathe hidden in the neck of the bulb. Perianth-tube cylindrical, reaching 3 in. long; limb  $1-1\frac{1}{4}$  in. long, white, tinged with red; segments  $\frac{1}{8}$  in. broad. Anthers in two superposed rows opposite the lower half of the limb,  $\frac{1}{4}$  in. long.

Hab. Natal; grassy hill at Imbumbulu, *Wood* 3193! Received in 1855. Named, at Mr. Wood's request, after Miss Etta Stainbank.

3. *A. BUCHANANI* Baker in Journ. Bot. 1878, 75; Hook. Ic. t. 1388. *Cyphonema Buchanani* Baker. — Bulb globose, 1 in. diam.; neck  $1-1\frac{1}{2}$  in. long. Leaves unknown. Spathe membranous, hyaline, an inch long, lacerated at the apex. Perianth-tube very slender, 2 in. long; limb whitish,  $1\frac{1}{2}$  in. long; segments oblanceolate, obtuse, cuspidate,  $\frac{1}{4}$  in. broad above the middle. Anthers in two distinct rows opposite the lower half of the limb,  $\frac{1}{4}$  in. long.

Hab. Mountains of Natal, *Krauss* 449! *Rev. J. Buchanan!* Gathered in 1875.

4. *A. BOLUSII* Baker in Journ. Bot. 1878, 75. — Bulb not seen. Leaves 3, contemporary with the flower, linear, firm in texture, spirally-twisted. Perianth-tube 2 in. long; limb whitish,  $1\frac{1}{2}$  in. long; segments oblong, subacute,  $\frac{1}{2}$  in. broad. Stamens in two superposed rows opposite the lower half of the limb,  $\frac{1}{4}$  in. long.

Hab. Mountains of Graaf-Reinet, alt. 4300 ft., *Bolus* 717! Discovered in 1868.

5. *A. MACOWANI* Baker. — Bulb globose, 1 in. diam.; neck  $1-1\frac{1}{2}$  in. long. Leaves linear, firm in texture, much crisped. Spathe and peduncle hidden in the neck of the bulb. Perianth-tube 3-4 in. long; limb white,  $1-1\frac{1}{2}$  in. long; segments oblong-lanceolate,  $\frac{1}{4}-\frac{1}{3}$  in. broad. Anthers in two superposed rows,  $\frac{1}{8}$  in. long.

Hab. Cape Colony; sandy ground at Port Elizabeth, and on the banks of the Coega River, *Macowan* 1928! Discovered in 1872.

6. *A. MACKENII* Baker in Journ. Bot. 1878, 75. — Bulb globose,  $\frac{1}{2}$  in. diam.; neck  $1\frac{1}{2}$  in. long. Peduncle and spathe hidden in the neck of the bulb. Leaves unknown. Perianth-tube very slender, 6-8 in. long; limb bright red, 2 in. long; segments lanceolate or oblanceolate, subacute,  $\frac{1}{4}-\frac{1}{3}$  in. broad. Anthers  $\frac{1}{8}$  in. long, placed in two superposed rows opposite the lower quarter of the limb.

Hab. Natal, on the Great Noodsberg, alt. 2500 ft., *MacKen!* (gathered in 1869), *Wood* 110! Flowers in May.

12. COOPERIA *Herb.*

*Perianth* solitary, erect, regular; tube long, cylindrical; limb funnel-shaped, with subequal oblong segments. *Stamens* inserted at the throat of the tube; filaments very short; anthers linear, erect. *Ovary* 3-celled; ovules many, superposed; style about as long as the tube; stigma trifold. *Capsule* membranous, loculicidally 3-valved, deeply 3-lobed. *Seeds* many, compressed; testa black.—*Rootstock* a tunicated bulb. *Leaves* linear, contemporary with the flowers in summer. *Flowers* whitish, fragrant; spathe single, membranous, tubular below the middle. — Habit of *Zephyranthes*, from which it differs by its stamens and long perianth-tube.

1. *C. DRUMMONDII* Herb. in Bot. Reg. t. 1835. — Bulb globose, 1 in. diam.; neck short. Leaves narrow linear, erect, a foot long. Peduncle slender, fragile, hollow,  $\frac{1}{2}$ –1 ft. long. Spathe  $1\frac{1}{2}$ –2 in. long, 2-valved at the tip. Ovary sessile; tube very slender, 3–5 in. long; limb  $\frac{3}{4}$ –1 in. long, white, tinged with red outside; segments oblong, obtuse, with a cusp,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad. Anthers  $\frac{1}{4}$  in. long. Capsule  $\frac{3}{4}$  in. diam., deeply lobed laterally.

Var. *C. CHLOROSOLEN* Herb. in Bot. Mag. t. 3482. — Perianth-tube stouter, tinged with green; limb longer, less rotate. Leaves a little broader.

Hab. Texas, New Mexico, and North Mexico. First gathered by Drummond about 1835.

2. *C. PEDUNCULATA* Herb. Amaryll. 179, t. 42; Bot. Mag. t. 3727. *Sceptranthus Drummondii* Graham. *Zephyranthes Drummondii* Don; Sweet, Brit. Flow. Gard. ser. 2, t. 328.—Habit more robust. Bulb with a neck 2–3 in. long. Leaves about 6, a foot long,  $\frac{1}{4}$  in. broad. Peduncle about  $\frac{1}{2}$  ft. above ground. Spathe 1–2-valved at the tip. Ovary shortly pedicellate. Perianth-tube  $1\frac{1}{2}$  in. long; limb nearly as long as the tube, tinged red outside; segments oblong, obtuse, cuspidate.

Hab. Texas, Drummond! Lindheimer 542! Hall 652!

13. ANOIGANTHUS *Baker.*

*Perianth* regular, erect; tube short, funnel-shaped; segments oblong-lanceolate, subequal. *Stamens* biserial, 3 inserted in the perianth-tube and 3 at its throat; filaments filiform; anthers erect, oblong. *Ovary* oblong, 3-celled; ovules numerous, superposed; style filiform; stigmas 3, slender, falcate. *Capsule* globose, membranous, loculicidally 3-valved down to the base. *Seeds* many, flat; testa black.—Monotypic.

1. *A. BREVIFLORUS* Baker in Journ. Bot. 1878, 76. *Cyrtanthus breviflorus* Harv. Thesaur. Cap. t. 139. — Bulb ovoid, 1 in. diam., with a short neck. Leaves 3–4, contemporary with the flowers, lorate, a foot or more long. Peduncle  $\frac{1}{2}$ –1 ft. long. Umbel 2–10-flowered; spathe-valves 2, lanceolate; pedicels erect, slender, 1–2 in. long. Perianth bright yellow, about an inch long; tube  $\frac{1}{4}$ – $\frac{1}{3}$  as long as the segments. Stamens half as long as the perianth-segments. Capsule  $\frac{1}{2}$  in. long; valves reflexing from the base.

Var. *MINOR* Baker. *A. luteus* Baker, *l. c.*, is a dwarf mountain form, with a short peduncle, and narrow perianth-segments.

Hab. Mountains of Natal and the eastern provinces of Cape Colony, ascending to 5000 ft. on the Sneewbergen. Flowers October to February.

#### 14. CHLIDANTHUS *Herb.*

(*Coleophyllum* Klotzsch.)

*Perianth* erect, regular; tube long, cylindrical; limb funnel-shaped, with subequal oblong segments. *Stamens* inserted at the throat of the perianth-tube; filaments short, subulate from a deltoid base; anthers ligulate, erect. *Ovary* oblong, 3-celled; ovules very numerous; style longer than the tube; stigmas linear, recurved. *Capsule* loculicidally 3-valved. *Seeds* many, flat; testa black.—*Monotypic*. Habit of *Crinum* § *Platyaster*, but flowers yellow, and stamens and seeds totally different.

1. *C. FRAGRANS* *Herb. App.* 46; *Lindl. Collect. t.* 34; *Bot. Mag. t.* 640; *Flore des Serres, t.* 326. — Bulb large, ovoid. Leaves about 6, contemporary with the flowers in June, linear, obtuse, glaucous, erect,  $\frac{1}{2}$  in. broad. Peduncle solid, 2-edged. Flowers 1–4 in an umbel, fragrant, bright yellow; spathe-valves 2, large, lanceolate; pedicels 0 or very short. Perianth-tube  $1\frac{1}{4}$ –3 in. long, tinged with green; segments oblong, cuspidate,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long. Anthers  $\frac{1}{3}$  in. long.

Hab. Andes of Peru, *Pavon!* *Matthews* 3180! *Quito, Lehmann* 391! *Catamarca, Lorentz*. The living specimens I have seen were sent by Col. Trevor Clarke and Dr. Wallace, the latter from bulbs gathered by Roezl. I cannot make out from the description that the Mexican *C. Ehrenbergii* Kunth, is more than a mere form of the Andine species.

#### 15. STERNBERGIA *W. & K.*

*Perianth* funnel-shaped; tube short or moderately long; segments lanceolate or oblong, equal, permanently ascending. *Stamens* inserted at the throat of the tube; filaments long, filiform; anthers oblong, dorsifixed, versatile. *Ovary* 3-celled; ovules many, superposed; style filiform; stigma capitate or shortly 3-lobed. *Fruit* fleshy, scarcely dehiscent. *Seeds* subglobose, sometimes strophiolate; testa thin, blackish. — *Bulb* with many tunics and a long neck. *Leaves* lorate, vernal or autumnal. *Peduncle* short; spathe single, membranous, tubular below the middle. *Flowers* bright yellow.

*Sternbergia proper*. Peduncle short. Flowers autumnal.

Leaves vernal. Perianth-tube long, cylindrical. . Sp. 1–2.

*Oporanthus*. Peduncle produced. Flowers and leaves contemporary. Perianth-tube short, funnel-shaped. Sp. 3–4.

1. *S. COLCHICIFLORA* *W. & K. Pl. Rar. Hung. ii.* 172, t. 159; *Reich. Ic. Germ. t.* 372, figs. 823–4; *Lindl. in Bot. Reg. t.* 2008. *Amaryllis citrina* *Sibth. & Sm. Fl. Græc. t.* 311. *A. colchiciflora* *Ker. S. atnensis* *Schult. S. Schuberti* *Sehenk.* — Bulb ovoid,  $\frac{1}{2}$ – $\frac{3}{4}$  in. diam. Leaves 4–6, linear, produced in spring with the

fruit, erect, 3-4 in. long. Peduncle not longer than the bulb-neck; spathe linear, an inch long. Flowers autumnal; perianth-tube cylindrical,  $\frac{1}{2}$ -1 in. long; segments oblanceolate, 1-1 $\frac{1}{4}$  in. long,  $\frac{1}{8}$ - $\frac{1}{6}$  in. broad. Stamens half as long as the limb. Stigma with 3 short falcate lobes. Fruit subglobose,  $\frac{1}{2}$  in. long, produced in spring. Seeds strophiolate.

Hab. Sicily, East Europe, Asia Minor, Crimea, Caucasus. *S. dalmatica* Herb. (Reich. Ic. Germ. t. 372, figs. 825-7) and *S. pulchella* Boiss. et Blanche, look to me mere varieties. *Narcissus persicus* Clus. Hist. ii. 163 (*S. Clusiana* Ker) is, from the figure, evidently this species, not the next.

2. *S. MACRANTHA* J. Gay in Balans. Exsicc. No. 827. *S. latifolia* and *stipitata* Boiss. *S. Clusiana* Boiss., non Ker. — Bulb globose, 1-1 $\frac{1}{2}$  in. diam., with a neck 4-6 in. long; tunics pale or brown. Leaves lorate, obtuse, glaucescent,  $\frac{3}{4}$  in. broad, fully developed in June. Peduncle as long as the bulb-neck; spathe 3-4 in. long, membranous, cylindrical in the lower half. Flowers bright yellow, produced in autumn; tube cylindrical, 2 in. long; segments oblong, 1-1 $\frac{1}{4}$  in. broad. Stamens more than half as long as the limb. Stigma not lobed.

Hab. Asia Minor, Syria, Palestine, West Persia, and Sinaitic Peninsula.

### Subgenus OPORANTHUS.

3. *S. LUTEA* Roem. & Schult. Syst. viii. 795; Reich. Ic. Germ. tab. 373, fig. 828. *Amaryllis lutea* L.; Bot. Mag. t. 290; Red. Lil.-t. 418; Fl. Græc. t. 310. *Oporanthus luteus* Herb. — Bulb ovoid, 1-2 in. diam. Leaves 5-6, lorate,  $\frac{1}{2}$  in. broad, a foot long, produced with the flowers in autumn. Peduncle protruded from the bulb-neck, sometimes 6-9 in. long, rarely 2-flowered. Spathe lanceolate, 1-1 $\frac{1}{2}$  in. long. Flowers produced in autumn, bright yellow; ovary sessile; tube funnel-shaped,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long; segments oblong, 1 $\frac{1}{4}$ -1 $\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. broad. Stamens more than half as long as the limb. Style sometimes as long as the limb; stigma not lobed. Fruit green, turbinate, developed in winter. Seeds black, shining, not strophiolate. *S. sicula* Tinco is a form with narrower leaves and perianth-segments. Var. *græca* Reich. Ic. Germ. fig. 828, from the mountains of Greece, is a form with leaves only 1-12th to 1-8th in. broad, and oblanceolate perianth-segments. There is a similar form in Crete with a longer peduncle.

Hab. Through the Mediterranean Region from Spain and Algeria to Syria and Persia.

4. *S. FISCHERIANA* Roem. Amaryll. 46. *Oporanthus Fischerianus* Herb. Habit of *S. lutea*, from which it differs by flowering in spring, and by its stipitate ovary and capsule.

Hab. Caucasus.

### 16. HAYLOCKIA Herb.

*Perianth* solitary, erect, regular; tube long, very slender; limb funnel-shaped, with equal obovate-oblong segments. *Stamens* biseriate at the throat of the perianth-tube; filaments short, filiform; anthers linear-oblong, versatile. *Ovary* 3-celled; ovules many,

superposed; style as long as the tube; stigmas linear, falcate. *Capsule* membranous, loculicidally 3-valved. *Seeds* many, flattened; testa black. — Monotypic. Allied to *Zephyranthes*, from which it differs by its short hypogæous peduncle. Habit like *Gethyllis*.

1. H. PUSILLA Herb. in Bot. Reg. t. 1371, *Zephyranthes pusilla* Dietr. *Sternbergia americana* Hoffm.—Bulb globose,  $\frac{3}{4}$ –1 in. diam.; neck 1–2 in. long. Leaves developed in winter, narrow linear, spreading. Peduncle not longer than the bulb-neck. Spathe membranous, bifid, tubular in the lower half. Ovary sessile. Perianth-tube 1–2 in. long, very slender, tinged with green; limb 1–1 $\frac{1}{4}$  in. long, whitish, sometimes tinged red outside: segments  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad. Filaments about as long as the anthers, which soon curl up. Capsule small, subglobose.

Hab. Buenos Ayres and Monte Video, *Sello! Gibert!* Flowers in March.

### 17. ZEPHYRANTHES Herb.

*Perianth* funnel-shaped, erect or slightly inclined; tube short or elongated, often minutely scaly at the throat; segments subequal. *Stamens* inserted near the throat or middle of the tube, erect or slightly declinate, more or less unequal; filaments filiform; anthers linear-oblong, versatile. *Ovary* 3-celled; ovules many, superposed; style filiform, more or less declinate; stigma usually trifid. *Capsule* subglobose, loculicidally 3-valved. *Seeds* flat or compressed, with a thin black testa.—*Rootstock* a tunicated bulb. *Leaves* narrow, usually contemporary with the flowers. *Peduncle* elongated, slender, hollow. *Spathe* membranous, tubular in the lower half, bifid at the apex. *Flower* white, red, or yellow. *Capsule* and seeds of *Hippeastrum*, from which it differs by its erect or suberect solitary flower and monophyllous spathe, tubular in the lower half.

Subgenus ZEPHYRANTHES PROPER. Flower erect; tube short. Stamens inserted near its throat.

Stigma trifid.

Ovary stalked.

Perianth 2–3 in. long . . . Sp. 1–3.

Perianth 1–2 in. long . . . Sp. 4–7.

Perianth an inch long or less . . . Sp. 8–14.

Ovary sessile . . . Sp. 15.

Stigma capitate, faintly 3-lobed . . . Sp. 16–18.

(*Argyropsis* Herb.)

Subgenus ZEPHYRITES (Herb.). Flower slightly inclined; tube short. Stamens inserted near its throat. Style more declinate than in the two other subgenera.

Perianth 2–3 in. long . . . Sp. 19–23.

Perianth 1–2 in. long . . . Sp. 24–29.

Subgenus PYROLIRION (Herb.). Flowers erect; tube longer, dilated in the upper half. Stamens inserted at the middle of the perianth-tube . . . Sp. 30–34.

1. *Z. ATAMASCO* Herb. App. 36. *Amaryllis Atamasco* L.; Bot. Mag. t. 239; Red. Lil. t. 31; Lodd. Bot. Cab. t. 1899.—Bulb ovoid, under 1 in. diam.; neck short. Leaves 4–6, contemporary with the flowers, bright green, narrow linear. Peduncle  $\frac{1}{2}$ –1 ft. long. Spathe 1–1 $\frac{1}{4}$  in. long; valves lanceolate. Pedicel much shorter than the spathe. Perianth pure white, 3 in. long; tube  $\frac{1}{2}$  in. long, tinged green; segments oblanceolate-unguiculate, acute,  $\frac{1}{2}$  in. broad. Stamens more than half as long as the limb; anthers  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Style trifid, reaching nearly to the tip of the segments.

Hab. Southern United States. Scentless. Flowers in March. The plant that represents *Amaryllis Atamasco* in the Linnean herbarium is *Cyrtanthus unijlorus*.

2. *Z. TREATIÆ* S. Wats. Proc. Amer. Acad. xiv. 300. — Bulb ovoid,  $\frac{3}{4}$  in. diam.; neck short. Leaves 6–8, contemporary with the flowers, grass-green, not shining, very narrow,  $\frac{1}{8}$  in. broad. Peduncle  $\frac{1}{2}$ –1 ft. long, purple at the base. Spathe  $\frac{3}{4}$ –1 in. long, tubular in the lower half; valves lanceolate. Pedicel much shorter than the spathe. Perianth white, 3 in. long; tube an inch long; segments keeled with red,  $\frac{1}{2}$  in. broad. Stamens half as long as the limb; anthers  $\frac{1}{8}$ – $\frac{1}{4}$  in. long. Style deeply trifid, reaching to the tip of the segments. Capsule depresso-globose, deeply lobed,  $\frac{1}{2}$  in. diam.

Hab. Florida, in damp ground, *Curtiss* 2829\*! Flowers in April and May. Described from a plant that flowered at Kew in 1880.

3. *Z. CARINATA* Herb. in Bot. Reg. t. 2594; Sweet, Brit. Flow. Gard. Ser. 2, t. 4; Bury, Hexand. t. 13. *Z. grandiflora* Lindl. in Bot. Reg. t. 902. *Amaryllis carinata* Spreng. — Bulb ovoid, 1 in. diam.; neck short. Leaves 4–6, contemporary with the flowers in summer, linear,  $\frac{1}{2}$ –1 ft. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad, shallowly channelled down the face. Peduncle 6–9 in. long. Spathe 1 $\frac{1}{2}$ –2 in. long, tubular in the lower half; valves lanceolate. Pedicel shorter than the spathe. Perianth-limb bright rose-red, 2 $\frac{1}{2}$ –3 in. long; tube  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; segments obovate,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad. Stamens reaching halfway up the limb; anthers above  $\frac{1}{2}$  in. long. Style overtopping the stamens, deeply trifid.

Hab. Jamaica, *March*! Cuba, *C. Wright* 3246! Mexico, *Duges*. Native name, *Mayo*. Guatemala, *Ortgies*! The commonest species of the genus now in cultivation. I have not seen the allied *Z. lilacina* Liebm., which is said to have lilac flowers 3 in. long, a pedicel as long as the flower, and a spathe an inch long.

4. *Z. TUBISPATHA* Herb. App. 96; Bury, Hexand. t. 25. *Amaryllis tubispatha* Gawl. in Bot. Mag. t. 1586. *Z. nervosa* Herb. *Amaryllis nervosa* H. B. K. — Bulb globose, 1 in. diam.; neck short. Leaves 4–5, narrow linear, flaccid, bright green, contemporary with the flower in spring or summer, sometimes above a foot long. Peduncle slender,  $\frac{1}{2}$  ft. long. Spathe 1–1 $\frac{1}{2}$  in. long, slit at the tip only. Pedicel longer than the spathe. Perianth 1 $\frac{1}{2}$ –2 in. long, white, slightly tinged with green, never with red; tube scarcely any; segments obovate,  $\frac{1}{2}$  in. broad. Stamens half as long as the limb. Style deeply trifid, overtopping the anthers. Capsule  $\frac{1}{2}$  in. diam.

Hab. West Indies, Venezuela, and New Granada. One of the commonest species of the genus in cultivation. Received living from Messrs. Bull, Henderson, &c. It is in Royle's Himalayan collections as a garden plant. *Z. Spofforthiana* Herb. in Bot. Reg. t. 1746, is a garden hybrid between this species and *carinata*.

5. *Z. MESOCHLOA* Herb. in Bot. Reg. t. 1361. *Z. acuminata* and *flavescens* Herb.; Kunth, Enum. v. 487. *Amaryllis mesochloa* Seubert.—Bulb ovoid,  $\frac{3}{4}$ –1 in. diam.; neck 1–1 $\frac{1}{2}$  in. long. Leaves narrow linear, contemporary with the flowers in spring. Peduncle slender, 4–9 in. long. Spathe 1–1 $\frac{1}{4}$  in. long, cylindrical in the lower half. Pedicel  $\frac{1}{2}$ –2 in. long. Perianth-limb 1–2 in. long, white or faintly tinged outside with red, rarely yellowish; tube none; segments acute, under  $\frac{1}{2}$  in. broad. Stamens half as long as the limb. Style deeply trifid. Capsule  $\frac{1}{3}$  in. diam.

Hab. Buenos Ayres, *Anderson, Tweedie!* Cordoba, Catamarca, and Entrerios, *Lorentz!* Paraguay, *Balansa 525! 527!* *Z. flavescens* Herb. is a form with the flowers straw-coloured when they first open. *Amaryllis entreriana* O. Hoffm. in Linnæa, xliii. 137, is probably a variety.

6. *Z. LINDLEYANA* Herb. Amaryll. 174, t. 35, fig. 5. *Z. nervosa* Mart. et Gal. Enum. 4. — Bulb globose,  $\frac{3}{4}$  in. diam.; neck short. Leaves narrow linear, contemporary with the flowers, 6–9 in. long. Peduncle slender,  $\frac{1}{2}$ –1 ft. long. Spathe 1–1 $\frac{1}{4}$  in. long, trifid only at the tip. Pedicel about as long as the spathe. Perianth bright red, 1 $\frac{1}{2}$ –2 in. long; tube greenish,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; segments obovate-cuneate,  $\frac{5}{8}$  in. broad. Stamens half as long as the limb; stigma trifid.

Hab. Mountains of Mexico, *Galeotti 5415! Bourgeau 2273! Schaffner 541!* Flowered at Kew in June, 1865.

7. *Z. WRIGHTII* Baker. — Bulb globose,  $\frac{3}{4}$  in. diam.; neck an inch long. Leaves 2–3, narrow linear, erect, short, contemporary with the flowers. Peduncle slender, 4–5 in. long. Spathe  $\frac{3}{4}$  in. long, tubular in the lower two-thirds. Pedicel nearly as long as the spathe. Perianth-limb bright red, 1 $\frac{1}{4}$ –1 $\frac{1}{2}$  in. long; tube  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; segments obovate,  $\frac{1}{4}$  in. broad above the middle. Stamens reaching halfway up the limb. Style trifid, overtopping the stamens.

Hab. Cuba, *C. Wright 3247!* Distributed as *Z. Lindleyana*, but, I think, distinct from the Mexican plant.

8. *Z. ROSEA* Lindl. in Bot. Reg. t. 821; Herb. in Bot. Mag. t. 2537; Bury, Hexand. t. 13. *Amaryllis rosea* Spreng. *A. carnea* Schultes fil.—Bulb globose,  $\frac{3}{4}$  in. diam.; neck scarcely any; tunics thin, brown, shining. Leaves about 6, spreading, linear, bright green,  $\frac{1}{2}$  in. broad, contemporary with the flowers in October. Peduncle slender, 4–6 in. long. Spathe  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, bifid at the tip only. Pedicel much longer than the spathe. Perianth bright red, about an inch long; tube short, greenish; segments obovate,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad. Stamens much shorter than the limb. Style trifid, nearly as long as the limb.

Hab. Cuba, *C. Wright 3248!* Described from a living plant from Messrs. Veitch, Oct. 1878. Probably it is identical with *A. bifolia* Lam., founded on an unpublished figure of Plumier.

9. *Z. COMMERSIONIANA* Herb. Amaryll. 174, t. 29, fig. 3. *Amaryllis Atamasco minor* Red. Lil. t. 454. — Bulb globose,  $\frac{1}{2}$ – $\frac{3}{4}$  in. diam.; neck 1–1 $\frac{1}{2}$  in. long. Leaves 3–4, contemporary with the flowers in August, narrow linear, finally 8–9 in. long. Peduncle slender, 4–6 in. long. Spathe  $\frac{3}{4}$ –1 in. long, bifid at the tip. Pedicel a little longer than the spathe. Perianth-limb bright red, yellow at the base, 1–1 $\frac{1}{4}$  in. long; tube none; segments oblanceolate-oblong, subacute,  $\frac{1}{3}$  in. broad. Stamens a little shorter than the perianth. Style deeply trifid. Capsule under  $\frac{1}{2}$  in. diam.

Hab. Monte Video, *Commerson*! (Herb. Smith).

10. *Z. DEPAUPERATA* Herb. Amaryll. 171. *Amaryllis depauperata* Poeppig. — Leaves narrow linear, produced with the flowers in spring. Peduncle slender, 4–5 in. long. Spathe an inch long, tubular in the lower half. Pedicel 1 $\frac{1}{2}$  in. long. Perianth an inch long, sulphur-yellow inside, tinged with red outside; tube very short; segments oblong, acute, under  $\frac{1}{2}$  in. broad. Stamens more than half as long as the limb. Style trifid.

Hab. Sandy plains of South Chili, *Poeppig*. A plant gathered by Dr. Gillies on the Cerro de Portezuelo, drawn by Herbert, and called *Z. filifolia*, is either the same species or a close ally. Its leaves are filiform. There are a number of unpublished drawings of *Amaryllideæ* by Herbert in the Lindley library. We have just received several specimens of a plant that only differs from Herbert's drawing by its smaller flowers, from Patagonia, from Mr. J. L. Williams Andrews.

11. *Z. LONGIFOLIA* Hemsl. Diag. Pl. Nov. iii. 55. *Z. aurea* S. Wats. in Proc. Amer. Acad. xviii. 161. — Bulb ovoid,  $\frac{3}{4}$ –1 in. diam.; neck 1 $\frac{1}{2}$ –2 in. long. Leaves very narrow, contemporary with the flowers in summer, 6–9 in. long. Peduncle slender, 3–6 in. long. Spathe  $\frac{3}{4}$ –1 in. long, tubular in the lower half. Pedicel much shorter than the spathe. Perianth  $\frac{3}{4}$ –1 in. long, bright yellow, coppery outside; tube short; segments unguiculate,  $\frac{1}{4}$  in. broad. Stamens much shorter than the limb. Style trifid. Capsule-valves orbicular,  $\frac{1}{4}$  in. broad.

Hab. New Mexico, *C. Wright* 1904! Arizona, *Pringle*! Texas, *Palmer* 1363! Highlands of Central Mexico, *Schaffner* 340! *Parry & Palmer* 870!

12. *Z. TEXANA* Herb.; Kunth. Enum. v. 487. *Habranthus Andersoni* var. *texanus* Herb. in Bot. Mag. t. 3596. — Bulb globose,  $\frac{3}{4}$  in. diam.; tunics dark brown; neck 1–1 $\frac{1}{2}$  in. long. Leaves 3–4, narrow linear, contemporary with the flowers. Peduncle very slender, 4–8 in. long. Spathe an inch long, bifid only at the tip. Pedicel erect, much longer than the spathe. Perianth erect, yellow inside, coppery yellow outside, an inch long; tube scarcely any; segments obovate, acute,  $\frac{1}{4}$  in. broad. Stamens more than half as long as the perianth. Style trifid, as long as the stamens. Capsule  $\frac{1}{3}$  in. diam.

Hab. Texas, first gathered by Drummond in 1835, and since by Lindheimer and Palmer.

13. *Z. GRACILIS* Herb. Amaryll. 172, t. 29, fig. 1. — Bulb and leaves unknown. Peduncle short, slender. Spathe  $\frac{5}{8}$  in. long. Pedicel shorter than the spathe. Perianth-limb above  $\frac{1}{2}$  in. long; tube scarcely any; segments oblanceolate, 1–12th in. broad.

Stamens nearly as long as the segments. Style reaching to the tip of the segments, shortly trifid.

Hab. Peru; Porto de Sta. Maria, *Pavon!* (Herb. Mus. Brit.).

14. *Z. MINIMA* Herb. Amaryll. 172, t. 24, fig. 3. *A. parvula* Seubert. *A. minima* Griseb. — Bulb globose,  $\frac{1}{2}$ – $\frac{3}{4}$  in. diam.; neck 1–1 $\frac{1}{2}$  in. long. Leaves filiform, contemporary with the flowers in April. Peduncle very slender, 2–4 in. long. Spathe  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, tubular in the lower half. Pedicel much shorter than the spathe. Perianth-limb about  $\frac{1}{2}$  in. long, yellow, tinged outside with red; tube very short; segments obovate, acute,  $\frac{1}{6}$  in. broad. Stamens more than half as long as the limb. Stigma trifid. Capsule globose,  $\frac{1}{4}$  in. diam.

Hab. Buenos Ayres, *Tweedie!* Entre Rios and Cordoba, *Lorentz!* *Hieronymus!*

15. *Z. VERECUNDA* Herb. in Bot. Mag. t. 2583; Baker in Ref. Bot. t. 356. *Z. sessilis* Herb.; Baker in Ref. Bot. t. 212. *Z. striata* Herb. in Bot. Mag. t. 2593. *Z. Grahamiana* Herb. Amaryll. 175, t. 29, fig. 2. *Amaryllis verecunda* and *striatula* Schultes fil. — Bulb ovoid,  $\frac{3}{4}$ –1 in. diam.; neck 1–2 in. long. Leaves 3–6, contemporary with the flowers in spring and summer, narrow linear, green,  $\frac{1}{2}$ –1 ft. long. Peduncle slender, 3–9 in. long. Spathe about an inch long, tubular in the lower half; segments lanceolate. Ovary sessile. Perianth-limb 1 $\frac{1}{2}$ –2 in. long, white, more or less tinged outside or keeled with red; tube  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; segments obovate,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad. Stamens reaching halfway up the segments. Style trifid, reaching to the tip of the segments. Capsule-valves orbicular,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad.

Hab. Highlands of Central Mexico, *Hartweg* 220! *Andrieux* 320! *Graham* 358! *Bourgeau* 240! *Schaffner!* Received living from Mr. Wilson Saunders, Colonel Trevor Clarke, Messrs. Backhouse, &c. The imperfectly-known *Z. pallida* Roem. (*A. minuta* H. B. K.) is probably a form of this species.

16. *Z. CANDIDA* Herb. in Bot. Mag. t. 2607; Lodd. Bot. Cab. t. 1419; Bury, Hexand. t. 25. *Amaryllis candida* Lindl. in Bot. Reg. t. 724. *A. nivea* Schultes fil. — Bulb ovoid, 1 in. diam.; neck 1–2 in. long. Leaves bright green, subterete, contemporary with the flowers in autumn and lasting through the winter, above a foot long. Peduncle slender, 6–9 in. long. Spathe an inch long, bifid halfway down. Pedicel shorter than the spathe. Perianth-limb 1 $\frac{1}{2}$ –2 in. long, pure white or slightly tinged with red outside; tube none; segments  $\frac{1}{2}$  in. broad. Stamens scarcely half as long as the segments. Style  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; stigma minutely 3-lobed. Capsule  $\frac{1}{2}$  in. diam.

Hab. Marshes of La Plata, abundant, *Tweedie!* Entre Rios, *Lorentz!* Widely spread in cultivation. Described from specimens in the Kew herbaceous ground, Sept. 1869.

17. *Z. CITRINA* Baker in Bot. Mag. t. 6605. — Bulb globose, 1 $\frac{1}{2}$  in. diam., copiously stoloniferous. Leaves 3–4, contemporary with the flower in August, bright green, deeply channelled down the face, a foot long,  $\frac{1}{6}$  in. broad. Peduncle  $\frac{1}{2}$  ft. long, ancipitous, green, tinged with red towards the base. Spathe under an inch

long. Pedicel shorter than the spathe. Perianth-limb bright yellow,  $1\frac{1}{2}$ -2 in. long; tube  $\frac{1}{3}$ - $\frac{1}{2}$  in. long; segments obovate-unguiculate, under  $\frac{1}{2}$  in. broad. Stamens more than half as long as the limb. Style shorter than the stamens; stigma with 3 orbicular lobes.

Hab. Received alive from Messrs. Veitch, Aug. 1881. Supposed to have been imported from Demerara.

18. *Z. MACROSIPHON* Baker in Gard. Chron. n. s. xvi. 70.—Bulb ovoid, 1 in. diam.; neck 2 in. long. Leaves 3-4, contemporary with the flowers in summer, linear, bright green, a foot long. Peduncle  $\frac{1}{2}$ -1 ft. long. Spathe  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. long, tubular in the lower half. Pedicel as long as or a little longer than the spathe. Perianth bright red, 2-2 $\frac{1}{4}$  in. long; tube as long as the obovate segments, which are above  $\frac{1}{2}$  in. broad at the middle. Stamens half an inch shorter than the limb. Stigma capitate, with 3 orbicular lobes.

Hab. Mexico. Received alive from Messrs. Veitch, May, 1881.

### Subgenus ZEPHYRITES.

19. *Z. ROBUSTA* Baker. *Habranthus robustus* Herb.; Sweet, Brit. Flow. Gard. ser. 2, t. 14; Lodd. Bot. Cab. t. 1761. *Amaryllis tubispatha* L'Herit. *A. robusta* Spach. *A. Berterii* Spreng.—Bulb ovoid, 1-1 $\frac{1}{2}$  in. diam.; neck short. Leaves linear, glaucous, produced after the flowers. Peduncle slender, 6-9 in. long. Spathe  $1\frac{1}{2}$ -2 in. long, cleft only in the upper quarter. Pedicel as long as the spathe. Perianth-limb erecto-patent, 2 $\frac{3}{4}$ -3 in. long, rose-red; tube short, greenish; segments subacute,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad. Stamens half as long as the limb. Stigma trifid.

Hab. Buenos Ayres, *Tweedie!* Introduced into cultivation in 1838. Flowers in July and August.

20. *Z. VERSICOLOR* Baker. *Habranthus versicolor* Herbert in Bot. Mag. t. 2485. *Amaryllis versicolor* Spreng.—Bulb oblong, 1 in. diam.; tunics nearly black. Leaves 3 or more, green, linear, a foot long, produced after the flower. Peduncle slender, 4-6 in. long. Spathe  $1\frac{1}{2}$  in. long, tubular in the lower half. Pedicel a little longer than the spathe. Perianth suberect, 2-2 $\frac{1}{2}$  in. long, white, flushed outside with red and green; tube very short; segments obovate-unguiculate, cuspidate,  $\frac{1}{2}$  in. broad. Stamens half as long as the limb. Style deeply trifid.

Hab. Maldonado, *Tweedie!* Introduced in 1824. Flowering in January.

21. *Z. SYLVATICA* Baker. *Amaryllis sylvatica* Mart. *Habranthus sylvaticus* Herb.—Bulb globose,  $\frac{3}{4}$ -1 in. diam.; tunics pale brown; neck an inch long. Leaves linear,  $\frac{1}{8}$  in. broad, produced after the flowers. Peduncle weak, slender, 3-4 in. long. Spathe an inch long, tubular in the lower half. Pedicel as long as or rather shorter than the spathe. Perianth erecto-patent, bright red, 2-2 $\frac{1}{2}$  in. long; tube greenish,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long; segments subequal,  $\frac{1}{3}$  in. broad. Stamens  $\frac{1}{2}$  in. shorter than the limb. Style very slender, declinate, trifid, longer than the stamens.

Hab. Bahia, *Martius*. Ceara, in dry open woods near Crato, *Gardner* 1857!

22. *Z. CONCOLOR* S. Wats. in Proc. Amer. Acad. xviii. 161. *Habranthus concolor* Lindl. in Bot. Reg. 1845, t. 54. — Bulb ovoid,  $1\frac{1}{2}$ –2 in. diam; tunics dark brown; neck 2–3 in. long. Leaves about 4, produced with the leaves in summer, linear, glaucescent, a foot long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad. Peduncle terete, a foot long. Spathe  $1\frac{1}{2}$ –2 in. long, bifid in the upper third. Pedicel 2–3 in. long. Perianth-limb lemon-yellow, 2– $2\frac{1}{2}$  in. long; tube short; segments obovate-unguiculate, cuspidate,  $\frac{3}{4}$  in. broad. Stamens half as long as the limb; anthers  $\frac{1}{2}$  in. long. Style overtopping the stamens, deeply trifid. Capsule nearly 1 in. diam.

Hab. Mountains of Mexico, ascending to 6000–8000 ft., *Hartweg* 219! *Parry & Palmer* 868! *Schaffner* 540! Sent alive by Messrs. Krelage, of Haarlem, in July, 1878.

23. *Z. ANDICOLA* Baker. *Habranthus andicola* Herb. *Amaryllis andicola* Poeppig. — Leaves linear, glaucous. Peduncle 6–7 in. long. Spathe bifid, reaching halfway up the flower. Perianth-limb bright violet, 2 in. long; tube  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Stamens very short, deflexed.

Hab. Chili; Andes of Antuco, *Poeppig*. Flowers in January. I have not seen any specimen.

24. *Z. MENDOCENSIS* Baker. — Bulb-neck an inch long. Leaves not seen. Peduncle slender, 5–6 in. long. Spathe an inch long, tubular in the lower half. Pedicel as long as or shorter than the spathe. Perianth-limb rather declinate, 18–21 lines long; upper segment  $\frac{1}{4}$  in. broad; lower narrower. Stamens unequal; longest more than half as long as the limb. Stigma trifid. Capsule small, globose.

Hab. Argentine territory; Province of Mendoza, *Reed*!

25. *Z. CEARENSIS* Baker. *Habranthus cearensis* Herb. — Bulb ovoid,  $\frac{3}{4}$  in. diam.; tunics pale brown; neck short. Leaves very narrow, produced after the flowers. Peduncle very slender, 4–5 in. long. Spathe an inch long, tubular in the lower half. Pedicel a little longer than the spathe. Perianth whitish, erecto-patent,  $1\frac{1}{2}$  in. long; tube  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; segments oblanceolate,  $\frac{1}{4}$  in. broad. Stamens more than half as long as the limb. Style trifid.

Hab. Brazil; Ceara, in woods near Crato, *Gardner* 1858! Goyaz, *Burchell* 8123! 8124! Quite distinct from *Z. Andersoni*, with which Seubert has confused it.

26. *Z. FRANCISCANA* Herb. MSS. — Bulb ovoid,  $1\frac{1}{2}$  in. diam.; tunics pale brown; neck  $1\frac{1}{2}$ –2 in. long. Leaves very narrow, produced with the flowers. Peduncle 4–8 in. long. Spathe 1– $1\frac{1}{4}$  in. long, tubular above the lower half. Pedicel at most as long as the spathe. Perianth-limb oblique, whitish, 1– $1\frac{1}{2}$  in. long; tube  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; segments oblanceolate,  $\frac{1}{4}$  in. broad. Stamens a little shorter than the limb. Stigma trifid.

Hab. Central Brazil; banks of the Rio St. Francisco, *Gardner* 1422! Flowers in March.

27. *Z. GRACILIFOLIA* Baker. *Habranthus gracilifolius* Herb. in Bot. Mag. t. 2464. *Amaryllis gracilifolia* Schultes fil. — Bulb 1 in. diam.; neck short; tunics dark brown. Leaves 4–5, linear, deeply channelled down the face, 6–9 in. long. Peduncle very slender,

4-8 in. long. Spathe  $\frac{3}{4}$ - $1\frac{1}{4}$  in. long, tubular in the lower half. Pedicel as long as or rather longer than the spathe. Perianth-limb an inch long, suberect, pale purplish pink; tube short; segments obovate, cuspidate,  $\frac{1}{3}$  in. broad. Stamens half as long as the limb. Style trifid.

Hab. Maldonado, *Tweedie*! Introduced in 1823. Monte Video, *Isabelle*! Flowers in September.

28. Z. ANDERSONI Baker. *Habranthus Andersoni* Herb. in Bot. Reg. t. 1345; Lodd. Bot. Cab. t. 1677; Sweet, Brit. Flow. Gard. ser. 2, t. 70. *Amaryllis Andersoni* Steudel. — Bulb ovoid,  $\frac{3}{4}$ -1 in. diam.; neck short. Leaves narrow linear, pale green, 5-6 in. long, produced with the flowers. Peduncle slender, 3-6 in. long. Spathe 1- $1\frac{1}{4}$  in. long, tubular below the middle; valves lanceolate. Pedicel longer than the spathe. Perianth suberect, 1- $1\frac{1}{2}$  in. long, bright yellow inside, coppery red outside; tube scarcely any; segments obovate, cuspidate,  $\frac{1}{3}$ - $\frac{1}{2}$  in. broad. Stamens unequal, half as long as the limb; anthers yellow,  $\frac{1}{6}$  in. long. Style trifid. Capsule  $\frac{1}{2}$  in. diam., deeply 3-lobed.

Hab. Monte Video, first introduced in 1829, *Anderson*! *Tweedie*! *Gibert*! Entre Rios, *Lorentz*! Buenos Ayres, *Tweedie*! Araucania, *Reynolds*! Described from plants flowered at Kew in June and July, 1887.

29. Z. CÆRULEA Baker. *Amaryllis (Habranthus) cærulea* Griseb. — Bulb under 1 in. diam.; neck 1- $2\frac{1}{2}$  in. long. Leaves unknown. Peduncle 3-4 in. long. Pedicel as long as the bifid spathe. Perianth pale blue, an inch long; tube none; segments obovate-unguiculate, mucronate. Stamens unequal; 3 longer equalling the trifid style.

Hab. Entre Rios; Concepcion del Uruguay, flowering in March, *Lorentz*.

#### Subgenus PYROLIRION.

30. Z. AUREA Baker. *Pyrolirion aureum* Herb. *Amaryllis aurea* Ruiz et Pavon, Fl. Peruv. t. 286A. *A. tubiflora* L'Herit. — Bulb globose,  $1\frac{1}{2}$  in. diam. Leaves about 5, linear, a foot long,  $\frac{1}{4}$  in. broad, contemporary with the flowers in December and January. Peduncle  $\frac{1}{2}$ -1 ft. long. Spathe membranous,  $1\frac{1}{2}$  in. long, cylindrical in the lower half. Ovary sessile. Perianth-limb erect, bright yellow; tube funnel-shaped, longer than the segments, suddenly dilated at the middle, furnished at the throat with minute toothed scales; segments acute, equal,  $1\frac{1}{2}$  in. long,  $\frac{1}{3}$  in. broad. Stamens inserted at the middle of the perianth-tube; filaments erect,  $1\frac{1}{2}$  in. long; anthers small, linear-oblong. Style trifid, reaching nearly to the tip of the segments.

Hab. Peru; Valley of Lima, in corn-fields, &c., *Pavon*! *Matthews* 400! *Nation*!

31. Z. FLAVA Baker. *Pyrolirion flavum* Herb. *P. aureum fauce lavi* Lindl. in Bot. Reg. t. 1724. — Differs from *Z. aurea* by being destitute of scales at the throat of the tube.

Hab. Peru. Known only from the plant described and figured by Lindley

32. Z. FLAMMEA Baker. *Amaryllis flammea* Ruiz et Pavon, Fl. Peruv. t. 286B. *Pyrolirion flammeum* Herb. — Just like *Z. aurea*,

but the colour of the flower flame-red. Segments furnished with small truncate crenate membranous scales at the base.

Hab. Peru; Valley of Lima, *Pavon!*

33. *Z. ALBICANS* Baker. *Pyrolirion<sup>s</sup> albicans* Herb. — Leaves linear, 7–8 in. long. Peduncle 6–8 in. long. Perianth-limb whitish, 4 in. long; tube as long as the segments.

Hab. Peru. (*Lilionarcissus monanthos flore albicante tubo prælongo*, Feuill. Obs. iii. 29, fig. 20).

34. *Z. BOLIVIENSIS* Baker. — Bulb globose,  $1\frac{1}{2}$  in. diam; neck  $1\frac{1}{2}$ –3 in. long. Leaves unknown. Peduncle slender,  $\frac{1}{2}$ –1 ft. long. Spathe an inch long. Ovary sessile, soon splitting open the spathe. Perianth-limb whitish, erect, 2 in. long; tube as long as the segments, cylindrical in the lower, funnel-shaped in the upper half; segments equal, oblong-lanceolate,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad. Stamens inserted halfway up the tube; anthers opposite the base of the segments. Style deeply trifid, much overtopping the stamens.

Hab. Bolivia; near Sorata, alt. 8000–9000 ft., *Mandon* 1194 in part! Flowers in September.

#### 18. SPREKELIA *Heist.*

*Perianth* ringent, horizontal; tube none; upper segment broadest; two lateral lanceolate; three lowest deflexed, rolled together to enclose the stamens and style. *Stamens* declinate, attached to the base of the segments, with minute scales between; filaments filiform; anthers linear-oblong, versatile. *Ovary* turbinate, 6-angled, 3-celled; ovules many, superposed; style filiform; stigma trifid. *Capsule* globose-trigonous, loculicidally 3-valved down to the base. *Seeds* many, discoid, narrowly winged; testa thin, black.—*Monotypic.*

1. *S. FORMOSISSIMA* Herb. App. 35; Sweet, Brit. Flow. Gard. ser. 2, t. 1446. *S. Heisteri* Trew Ehrhet, t. 24. *Amaryllis formosissima* L.; Bot. Mag. t. 47; Red. Lil. t. 5; Bury, Hexand. t. 6.—Bulb globose, 2 in. diam.; tunics brown. Leaves 3–6, contemporary with the flowers in April, linear, green, finally  $1-1\frac{1}{2}$  ft. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad. Peduncle reddish, hollow, slightly compressed,  $\frac{1}{2}$ –1 ft. long. Spathe red-brown, 2 in. long, bifid at the tip. Pedicel about as long as the spathe, erect. Perianth bright crimson,  $3\frac{1}{2}$ –4 in. long; upper segments distinctly unguiculate, upper an inch broad at the middle; side ones  $\frac{1}{2}$  in. broad, recurved towards the tip; three lowest connivent in the lower half. Capsule-valves orbicular,  $\frac{3}{4}$  in. broad.

Var. *S. GLAUCA* Lindl. in Bot. Reg. 1841, t. 6.—Leaves glaucous. Flowers smaller and paler than in the type.

Var. *S. KARWINSKII* Roem. Amaryll. 144.—Perianth less brightly coloured; segments keeled and bordered with white.

Var. *S. RINGENS* Morren in Ann. Soc. Hort. Gand. ii. 133, t. 60.—Leaves glaucous. Flower cernuous; upper segment vittate at the base and middle with yellow.

Hab. Mexico and Guatemala, introduced into Europe in 1593. Flowers with the leaves in spring. We are indebted to Colonel Trevor Clarke for the capsule and ripe seeds.

19. UNGERNIA *Bunge.*

*Perianth* regular; tube funnel-shaped, naked at the throat; segments oblong, subequal, keeled with many close green ribs. *Stamens* inserted into two rows near the throat of the tube; filaments filiform, nearly straight; anthers linear-oblong, versatile. *Ovary* 3-celled; ovules many in a cell; style filiform; stigma capitate, minutely 3-lobed. *Capsule* membranous, deeply lobed laterally, loculicidally 3-valved. *Seeds* flat; testa thin, black.—*Rootstock* a large bulb, with a long neck. *Leaves* lorate, not produced with the flowers. *Peduncle* solid. *Umbel* many-flowered, with 2 spathe-valves. Differs from *Lycoris* by its numerous ovules and discoid seeds.

1. U. TRISPHERA Bunge in Bull. Soc. Imp. Nat. Mosc. 1875, ii. 271. *Lycoris Sewerzowi* Regel, Gartenfl. t. 914.—Bulb 3 in. diam.; tunics many, thin, bright brown, produced  $\frac{1}{2}$  ft. above its neck. Leaves lorate. Peduncle  $\frac{1}{2}$ –1 ft. long. Umbel 6–15-flowered; central flowers erect, outer rather inclined; pedicels 1–3 in. long, stout, stiff; spathe-valves large, lanceolate. Perianth 1–1 $\frac{1}{4}$  in. long; tube  $\frac{1}{2}$  in. long, cylindrical in the lower half; segments reddish, acute,  $\frac{1}{8}$  in. broad, keeled with 7–9 close ribs. Stamens shorter than the segments. Capsule nearly 1 in. diam. Seeds 10–12 in a cell.

Hab. Khorassan, *Bunge!* Turkestan, *Sewerzow.* Afghan boundary, abundant, *Aitchison* 714! Introduced into England alive by Dr. Aitchison in 1886.

2. U. FLAVA Boiss. et Haussk. Fl. Orient. v. 149. — Habit of *U. trisphæra*, from which it differs by its yellow flowers and shorter perianth-tube, gradually dilated from the base to the apex.

Hab. South-western Persia, discovered by Dr. Hausskewech.

3. U. ? OLDHAM Maxim. in Engler Jahrb. 1884, vi. 76.—Bulb and leaves unknown. Peduncle a span long. Umbel many-flowered; spathe-valves rigid; filiform bracteoles present. Perianth with ovary 1 $\frac{1}{2}$  in. long; limb reddish; tube half as long as the revolute linear segments. Stamens shorter than the limb. Ovules 12–15 in a cell.

Hab. Japan. Known only from a single specimen given to Dr. Maximowicz by a native botanist. Oldham's plant is not this, but *Lycoris sanguinea*.

20. LYCORIS *Herb.*

*Perianth* funnel-shaped, rather irregular; tube short, cylindrical, dilated at the apex, sometimes scaly at the throat; segments oblanceolate, subequal, unguiculate. *Stamens* inserted near the throat of the tube; filaments long, filiform, declinate; anthers oblong, versatile. *Ovary* 3-celled; ovules few in a cell; style long, filiform; stigma capitate, minute. *Capsule* membranous, loculicidally 3-valved. *Seeds* few, turgid; testa black, opaque.—*Rootstock* a bulb with membranous tunics and a short neck. *Leaves* linear or lorate, not usually developed with the flowers. *Peduncle* solid. *Umbels* many-flowered; spathe-valves 2, lanceolate; pedicels often bracteolate. *Flowers* red or yellow.

Flowers yellow . . . . .	Sp. 1-2.
Flowers red.	
Stamens nearly as long as the limb . . . . .	Sp. 3-4.
Stamens much longer than the limb . . . . .	Sp. 5.

1. *L. AUREA* Herb. App. 20. *Amaryllis aurea* L'Herit. Stirp. t. 16; Bot. Mag. t. 409; Red. Lil. t. 61; Bot. Reg. t. 611. *Nerine aurea* Bury, Hexand. t. 3. — Bulb subglobose, 2 in. diam. Leaves 5-7, ensiform, glaucous, produced in May,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad. Peduncle subterete, 1-2 ft. long. Flowers bright yellow, inodorous, produced in August. Umbel 5-10-flowered; spathe-valves large, lanceolate; pedicels short, stout. Perianth 3 in. long; tube  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, scaly at the throat; segments subringent, rather crisped,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad. Stamens declinate, rather exerted, as is also the style.

Hab. China, introduced into English gardens by Dr. Fothergill in 1777. *Hort. Salisbury* 1785! *Formosa*, *Oldham* 643! *Hancock*! Apparently only cultivated in Japan.

2. *L. STRAMINEA* Lindl. in Journ. Hort. Soc. iii. 76. — Allied to *L. aurea*, but segments pale straw-coloured, with a pink keel, and a few scattered red dots; tube very short.

Hab. China, introduced into cultivation by Fortune in 1845.

3. *L. SQUAMIGERA* Maxim. in Engler Jahrb. 1884, 79. — Bulb large, globose. Leaves 5-6 to a bulb, produced in spring, above a foot long,  $\frac{3}{4}$ –1 in. broad at the middle. Peduncle stout, 2-3 ft. long. Flowers rose-lilac, fragrant, produced in July and August. Umbel 4-7-flowered; spathe-valves large, lanceolate; pedicels short, stout, bracteolate. Perianth 3 in. long; tube  $\frac{1}{2}$  in. long, scaly at the throat, cylindrical below the apex; segments subringent, obtuse with a cusp,  $\frac{1}{2}$  in. broad above the middle. Stamens declinate, nearly as long as the segments. Style a little exerted.

Hab. Japan, *Maximowicz*! A plant from grave-yards at Ningpo, *Hancock* 34! with longer more slender pedicels, will probably prove distinct. Nearly allied to *L. aurea*; differs by its red flowers and shorter stamens.

4. *L. SANGUINEA* Maxim. in Engler Jahrb. 1884, 80. — Bulb ovoid, 1 in. diam.; neck 1-2 in. long. Leaves 3-7, produced after the flowers, linear, obtuse,  $\frac{1}{8}$  in. broad. Peduncle slender, 1-1 $\frac{1}{2}$  ft. long. Umbel 4-6-flowered; spathe-valves lanceolate; pedicels slender, generally 1-2 in. long. Perianth erect, bright red, 1 $\frac{1}{2}$ –2 $\frac{3}{4}$  in. long; tube  $\frac{1}{2}$  in. long, cylindrical below the apex, not scaly at the throat; segments erect, oblanceolate,  $\frac{1}{8}$  in. broad, neither crisped nor reflexing. Stamens shorter than the limb. Style finally exerted.

Hab. Japan, *Oldham* 188! *Buerger*! *Maximowicz*! *Dickins*! Has the most nearly regular flowers of any species of the genus.

5. *L. RADIATA* Herb. App. 20. *Amaryllis radiata* L'Herit.; Andr. Bot. Rep. t. 25; Bot. Reg. t. 596. *A. sarniensis* Thunb., non Linn. *Nerine japonica* Miquel. Genus *Orexis* Salisb.—Bulb globose, 1 $\frac{1}{2}$  in. diam.; neck short. Leaves 5-6, produced in winter, linear, obtuse, glaucous,  $\frac{1}{2}$  ft. long,  $\frac{1}{4}$  in. broad. Peduncle slender, 1-1 $\frac{1}{2}$  ft. long. Flowers bright red, inodorous, produced in autumn. Umbel 4-12-

flowered; spathe-valves lanceolate; pedicels short, slender. Perianth  $1\frac{1}{2}$  in. long; tube very short; segments oblanceolate, crisped, spreading more widely than in the other species and more recurved,  $\frac{1}{8}$  in. broad. Stamens declinate, nearly twice as long as the segments. Style  $2\frac{1}{2}$ –3 in. long.

Hab. China and Japan, widely spread and long cultivated. Introduced into English gardens in 1750. Noticed by Kœmpfer in 1712.

## 21. HIPPEASTRUM *Herb.\**

*Perianth* funnel-shaped, usually more or less declinate; tube usually short, rarely long, often furnished with minute scales or a distinct neck at the throat; segments nearly equal or the lowest of the inner row narrower. *Stamens* inserted at the throat of the tube, more or less declinate; filaments filiform; anthers linear or linear-oblong, versatile. *Ovary* 3-celled; ovules many, superposed; style long, declinate; stigma capitate or trifid. *Capsule* globose, loculicidally 3-valved. *Seeds* usually flattened, with a thin black testa.—*Rootstock* a bulb with membranous tunics. *Leaves* linear or lorate. *Peduncle* hollow. *Flowers* usually 2 or more in an umbel, rarely solitary, but, if so, the spathe is bifid down to the base, and the pedicel furnished at the base with a linear bracteole. *Flowers* usually bright red or whitish.

\* *Leaves linear.*

Subgenus 1. HABRANTHUS (*Herb.*).—Perianth openly funnel-shaped; tube short. Stigma trifid.

Umbel 1–2-flowered . . . Sp. 1–5.

Umbel 3–6-flowered . . . Sp. 6–10.

Subgenus 2. PHYCELLA (*Lindl.*).—Perianth narrowly funnel-shaped; tube short. . . . Sp. 11–13.

Subgenus 3. RHODOPHALA (*Presl.*).—Perianth openly funnel-shaped; tube short. Stigma capitate.

Umbel 1-flowered . . . Sp. 14–16.

Umbel 2–6-flowered . . . Sp. 17–18.

\*\* *Leaves lorate.*

Subgenus 4. MACROPODASTRUM.—Perianth with a long tube. Stigma capitate . . . . . Sp. 19.

Subgenus 5. OMPHALISSA (*Salisb.*). — Perianth with a short tube, closed in by a distinct neck at the throat.

Stigma trifid . . . Sp. 20–23.

Stigma capitate . . . Sp. 24–26.

Subgenus 6. ASCHAMIA (*Salisb.*). — Perianth with a short tube, not closed in at the throat. Stigma capitate.

Perianth-tube very short Sp. 26–32.

Perianth-tube  $\frac{1}{2}$ –1 in. long Sp. 33–35.

Subgenus 7. LAIS (*Salisb.*). — Perianth-tube short, not closed in at the throat. Stigma trifid . . . Sp. 36–38.

\* See Baker in Journ. Bot. 1879, 79.

## Subgenus HABRANTHUS.

1. *H. SORATENSE* Baker.—Bulb ovoid, under 1 in. diam. Leaves about 4, narrow linear, 1-12th in. long, contemporary with the flowers in September. Peduncle slender, 4 in. long. Umbel 2-flowered; spathe-valves 2, linear, 3 in. long; pedicels  $\frac{3}{4}$ -1 in. long. Perianth-limb erect, 4-4 $\frac{1}{2}$  in. long; tube 3 in. long, funnel-shaped at the apex, cylindrical below it; segments oblong-lanceolate, 1 $\frac{1}{4}$  in. long,  $\frac{1}{4}$  in. broad at the middle. Stamens as long as the segments; anthers  $\frac{1}{4}$  in. long. Style deeply trifid.

Hab. Andes of Bolivia; Sorata, alt. 8000-9000 ft., *Mandon!*

2. *H. CHILENSE* Baker in Journ. Bot. 1878, 82. *Habranthus chilensis* Herb. *Amaryllis chilensis* R. & P.—Bulb globose, 1-1 $\frac{1}{2}$  in. diam.; neck 1-3 in. long; tunics dull brown. Leaves about 2, narrow linear, contemporary with the flowers, 6-9 in. long. Peduncle 6-9 in. long. Umbel mostly 2-flowered; spathe-valves linear, 1 $\frac{1}{2}$  in. long; pedicels  $\frac{1}{2}$ -1 in. long. Perianth-limb erect or ascending, 1 $\frac{1}{2}$ -2 in. long; tube very short; segments bright red or yellow, oblong, acute,  $\frac{1}{3}$  in. broad at the middle. Stamens shorter than the perianth-segments: anthers oblong,  $\frac{1}{3}$  in. long. Style reaching to the tip of the segments; stigma trifid.

Hab. Sandy plains of South Chili, *Pavon! Lesson! Reed!* Flowers in spring.

3. *H. ROSEUM* Baker in Journ. Bot. 1878, 82. *Habranthus roseus* Herb.; Sweet, Brit. Flow. Gard. ser. 2, t. 107. *H. pumilus* Lodd. Bot. Cab. t. 1771. *Zephyranthes purpurea* Philippi. — Bulb ovoid, under 1 in. diam.; neck short; tunics dark brown. Leaves about 3, contemporary with the flowers in summer, narrow linear, glaucous, a foot long. Peduncle slender,  $\frac{1}{2}$  ft. long. Flower usually solitary, nearly horizontal; spathe 2-valved, 1-1 $\frac{1}{2}$  in. long; pedicel shorter than the spathe. Perianth-limb 2 in. long, bright red; tube very short, greenish; segments oblong-lanceolate, acute. Stamens shorter than the segments; anthers  $\frac{1}{3}$  in. long. Style longer than the stamens; stigma trifid.

Hab. Chili, *Reed!* Introduced into cultivation from the Island of Chiloe by Lieut. Barlow in 1831, but now lost.

4. *H. LINEATUM* Baker in Journ. Bot. 1878, 82. *Habranthus lineatus* Philippi. — Bulb and leaves unknown. Peduncle slender,  $\frac{1}{2}$  ft. long. Umbel 2-flowered; spathe-valves linear, above 2 in. long; pedicels half as long as the spathe-valves. Flowers cernuous, yellow, marked with red lines, 1 $\frac{1}{2}$ -2 in. long; tube  $\frac{1}{4}$  in. long; segments oblanceolate,  $\frac{1}{3}$  in. broad. Stamens much shorter than the segments. Style shorter than the segments; stigma trifid.

Hab. Chili, near Santiago, *Philippi.* Flowers in September.

5. *H. BRACHYANDRUM* Baker. — Bulb and leaves not seen. Peduncle slender, a foot long. Umbel 1-flowered; spathe-valves linear, 2 in. long; pedicel as long as the spathe. Flower nearly erect, bright red, 3 $\frac{1}{2}$  in. long; tube short, funnel-shaped; segments oblong-lanceolate, acute,  $\frac{1}{2}$  in. broad. Stamens under an inch long. Style reaching halfway up the flower; stigma deeply trifid.

Hab. On the Parana, lat. 26—27° S., *Parodi*! Received at Kew in 1883, a dried specimen.

6. *H. ADVENUM* Herb. App. 31. *Amaryllis advena* Gawl. in Bot. Reg. t. 849; Bot. Mag. t. 1125. *Habranthus hesperius* Herb. II. *mendocinus* Philippi. *Eustephia Macleanica* Baker in Ref. Bot. t. 332, non Herb. *Chlidanthus Cumingii* Presl. — Bulb ovoid,  $1\frac{1}{2}$  in. diam.; neck short; tunics dark brown. Leaves linear, a foot long, glaucous green. Peduncle  $\frac{1}{2}$ –1 ft. long. Umbel 2–6-flowered; spathe-valves lanceolate,  $1\frac{1}{2}$ –2 in. long; pedicels 1–3 in. long. Flowers horizontal or ascending, openly funnel-shaped,  $1\frac{1}{2}$ –2 in. long, yellow or red; tube very short, greenish, crenulate at the throat; segments oblong-lanceolate, acute,  $\frac{1}{4}$  in. broad. Stamens declinate, much shorter than the perianth; anthers  $\frac{1}{2}$  in. long. Style exceeding the stamens; stigma trifid. Var. *pallidus* Herb.; Lodd. Bot. Cab. t. 1760, has pale yellow flowers. *Habranthus minutus* D. Don in Sweet Brit. Flow. Gard. ser. 2, t. 213, has large bright red flowers.

Hab. Chili, about Valparaiso, Santiago, &c., flowering in December and January. First figured by Feuillée in 1714.

7. *H. BIFIDUM* Baker in Journ. Bot. 1878, 83. *Habranthus bifidus* Herb. in Bot. Mag. t. 2599. — Bulb globose,  $1\frac{1}{2}$  in. diam.; tunics dark brown; neck 2–3 in. long. Leaves 2–3 in. long, linear, slightly glaucous, a foot long, produced after the flowers. Peduncle slightly compressed, a foot long. Umbel 3–6-flowered; spathe-valves lanceolate, 2–3 in. long; pedicels slender, 1–2 in. long. Flowers bright red, erect or suberect, about 2 in. long; tube very short, coronulate at the throat; segments oblanceolate-unguiculate, obtuse, cuspidate,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad. Stamens declinate, unequal, about half as long as the limb; anthers  $\frac{1}{2}$  in. long. Style longer than the stamens; stigma trifid.

Hab. Plains of Buenos Ayres and Monte Video. Introduced by Lord Carnarvon about 1825. Flowers in March. I cannot separate as species *Habranthus kermesinus* Herb. (Bot. Reg. t. 1638), *H. intermedius* Herb. (Bot. Reg. t. 1148), *H. nobilis*, *memoralis*, *spathaceus*, *angustus* (Bot. Mag. t. 2639), *pulcher*, and *pedunculatus* Herb. Received alive lately from Colonel Trevor Clarke and Miss F. Hall, of Paddington. A closely allied plant gathered by Jameson and Colonel Hall in the Andes of Ecuador will probably prove a distinct species.

8. *H. BAGNOLDI* Baker in Journ. Bot. 1878, 83. *Habranthus Bagnoldi* Herb. in Bot. Reg. t. 1396. — Bulb globose, 2 in. diam.; tunics nearly black. Leaves linear, glaucous, a foot long. Peduncle slender, a foot long. Umbel 4–6-flowered; spathe-valves lanceolate, 2 in. long; pedicels finally 2–3 in. long. Flowers erect or suberect, openly funnel-shaped,  $1\frac{1}{2}$ –2 in. long, yellow, tinged with red; tube very short, funnel-shaped, coronulate at the throat; segments oblong,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad. Stamens rather shorter than the perianth-limb; anthers  $\frac{1}{2}$  in. long. Style as long as the perianth; stigma trifid.

Hab. Chili, near Coquimbo, *Cuming* 865! Var. *Gilliesianus* Herb., from Melocoton, has smaller flowers than the type, pale yellow, with shorter pedicels. *H. punctatus* Herb., collected by Reynolds in South Chili, has copious small reddish dots on the flower-segments.

9. H. *BERTEROANUM* Baker in Journ. Bot. 1878, 83. *Hippeastrum Berteroanum* Philippi.—Leaves and bulb unknown. Peduncle 9–12 in. long. Umbel 5–6-flowered; spathe-valves lanceolate,  $1\frac{1}{2}$ –2 in. long; pedicels sometimes as long. Flowers purple, unspotted, openly funnel-shaped,  $2\frac{1}{4}$  in. long; tube very short, minutely squamulose at the throat; segments oblanceolate,  $\frac{1}{3}$  in. broad. Stamens much shorter than the flower.

Hab. Chili; Rancagua, flowering in January, *Bertero*.

10. H. *JAMESONI* Baker in Journ. Bot. 1878, 83. — Bulb and leaves not seen. Peduncle slender,  $\frac{1}{2}$  ft. long. Umbel 2–4-flowered; spathe-valves lanceolate,  $1\frac{1}{2}$ – $2\frac{1}{2}$  in. long; pedicels shorter than the spathe. Flowers horizontal, ascending or cernuous, red, 2– $2\frac{1}{2}$  in. long; tube very short, funnel-shaped; segments oblong, acute,  $\frac{1}{2}$  in. broad at the middle; lower inner narrower. Stamens declinate, unequal, about half as long as the segments. Style rather longer than the stamens; stigma trifid.

Hab. Argentine Republic; ravines near Jachal, flowering in February, *Jameson*!

#### Subgenus PHYCELLA.

11. H. *PHYCELLOIDES* Baker in Journ. Bot. 1878, 83. *Habranthus phycelloides* Herb. in Bot. Reg. t. 1417.—Bulb ovoid,  $1\frac{1}{2}$ –2 in. diam.; neck about 2 in. long. Leaves 3–4, narrow linear, glaucous, contemporary with the flowers. Peduncle  $\frac{1}{2}$ –1 ft. long. Umbel 3–6-flowered; spathe-valves linear, 2–3 in. long; pedicels  $1\frac{1}{2}$ –2 in. long. Flowers erect or ascending, bright red, yellowish inwards; tube  $\frac{1}{3}$  in. long, with a minute ciliated corona at the throat; segments oblanceolate,  $\frac{1}{3}$  in. broad, connivent except at the tip. Stamens as long as the perianth; anthers  $\frac{1}{8}$  in. long. Style exerted; stigma minutely tricuspidate.

Hab. Andes of Chili, *Macrae*! *Reed*! Introduced into cultivation in 1830. Connects the subgenera *Habranthus* and *Phycella*.

12. H. *BICOLOR* Baker in Journ. Bot. 1878, 83. *Amaryllis bicolor* R. & P. *A. cyrtanthoides* Sims in Bot. Mag. t. 2399. *A. ignea* Lindl. Bot. Reg. t. 809. *Phycella ignea*, *cyrtanthoides*, *magnifica*, *graciliflora*, *attenuata*, *brevituba*, *bicolor*, and *biflora* Herb. (Bot. Reg. t. 1943). *P. angustifolia* Philippi. — Bulb globose, 2 in. diam.; tunics dark brown; neck 1–2 in. long. Leaves about 4, contemporary with the flowers, linear, obtuse,  $1\frac{1}{2}$ –2 ft. long, about  $\frac{1}{2}$  in. broad, narrowed to the base. Peduncle slender, terete, 1– $1\frac{1}{2}$  ft. long. Umbel 4–9-flowered; spathe-valves lanceolate, 1– $1\frac{1}{2}$  in. long; pedicels slender, as long as the spathe. Flowers ascending, narrowly funnel-shaped,  $1\frac{1}{2}$ –2 in. long, bright red, passing into yellowish green towards the base; tube short, funnel-shaped, appendiculate with 6 minute teeth at the throat; segments oblanceolate, with a long claw, connivent,  $\frac{1}{3}$  in. broad near the tip. Stamens unequal, declinate, nearly as long as the segments. Style exerted; stigma capitate.

Hab. Frequent in Chili, about Valparaiso, &c., flowering in October. I cannot make out any specific characters to separate the synonyms above cited. The finest variety is *P. magnifica* Herb., which has a perianth-limb 3 in. long.

13. *H. HERBERTIANUM* Baker in Journ. Bot. 1878, 83. *H. andinum* Baker. *Phycella Herbertiana* Lindl. in Bot. Reg. t. 1341. *Rhodophiala? andina* Philippi.—Bulb globose,  $1\frac{1}{2}$  in. diam. Leaves 3–4, contemporary with the flowers,  $1-1\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. broad. Peduncle slender, a foot long. Umbel 4–6-flowered; spathe-valves lanceolate, 2 in. long; pedicels slender,  $1-1\frac{1}{2}$  in. long. Flowers bright red, suberect, narrowly funnel-shaped, above 2 in. long; tube very short; segments oblanceolate, acute,  $\frac{1}{4}$  in. broad above the middle. Stamens as long as the segments; anthers  $\frac{1}{6}-\frac{1}{4}$  in. long. Style exerted; stigma capitate.

Hab. Chili; Cordilleras of Santiago, *Philippi!* Introduced into cultivation by Macrae in 1825, but now lost.

#### Subgenus RHODOPHALA.

14. *H. MODESTUM* Baker in Journ. Bot. 1878, 83. *Rhodophiala modesta* Philippi.—Bulb ovoid,  $\frac{1}{2}$  in. diam.; tunics grey; neck 1–2 in. long. Leaves 2–3, narrow linear, developed after the flowers. Peduncle very slender, 1-flowered, protruded only about an inch from the neck of the bulb, Spathe of 2 linear valves  $\frac{1}{2}$  in. long. Pedicel erect,  $\frac{1}{4}$  in. long. Flower erect; tube very short; segments oblanceolate, acute, under 1-12th in. broad, white, with a broad red keel. Stamens rather shorter than the segments. Style as long as the limb; stigma capitate.

Hab. Andes of Chili; Cuerta de los Molles, *Philippi!*

15. *H. RHODOLIRION* Baker in Journ. Bot. 1878, 84. *Rhodolirion andinum* Philippi.—Bulb and leaves unknown. Peduncle 1-flowered,  $1\frac{1}{2}$  ft. long. Spathe-valves lanceolate,  $1\frac{1}{2}-2$  in. long; pedicel  $\frac{3}{4}$  in. long. Perianth bright red, openly funnel-shaped, 3 in. long; tube greenish,  $\frac{3}{4}$  in. long. Stamens half as long as the limb. Style overtopping the stamens; stigma capitate.

Hab. Chili; Andes of the Province of St. Fernando, *Bustillos.*

16. *H. UNIFLORUM* Baker in Journ. Bot. 1878, 83. *Rhodolirion montanum* Philippi.—Bulb globose,  $1\frac{1}{2}$  in. diam.; neck 2–3 in. long. Leaves linear, developed after the flowers. Peduncle 1-flowered, 2–4 in. long; spathe-valves linear, an inch long; pedicel very short. Flower erect, red, about 2 in. long; tube funnel-shaped, above  $\frac{1}{2}$  in. long; segments oblong, acute,  $\frac{1}{2}$  in. broad at the middle. Stamens half as long as the limb. Style erect, overtopping the stamens; stigma capitate.

Hab. Chili; Cordilleras of Santiago, *Philippi!* Judging from the description, *Rhodophiala uniflora* Philippi, from the Province of Atacama, differs from this by its shorter tube, which is only as long as the ovary.

17. *H. MONTANUM* Baker in Journ. Bot. 1878, 83. *Habranthus montanus* Philippi.—Leaves linear,  $\frac{1}{6}$  in. broad. Peduncle 9–12 in. long. Umbel 2–4-flowered: spathe-valves lanceolate,  $1\frac{1}{2}$  in. long; pedicels rather shorter. Perianth an inch long, openly funnel-shaped, yellow; segments reflexing towards the tip. Stamens straight, slightly shorter than the perianth. Style just exerted; stigma faintly 3-lobed.

Hab. Chili; Province of Talca; Cordillera of St. Francisco, *Philippi.*

18. *H. PRATENSE* Baker in Journ. Bot. 1878, 84. *Habranthus pratensis* Herb.; Bot. Reg. 1842, t. 35. *Rhodophiala amarylloides* Presl. *Placea pratensis* Poepp. *Stephanoma elegans* Kunze. *Habranthus speciosus* Herb.—Bulb ovoid,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. diam.; neck short; tunics dark brown. Leaves linear, contemporary with the flowers in spring, 1– $1\frac{1}{2}$  ft. long,  $\frac{1}{4}$ – $\frac{1}{2}$  in. broad. Peduncle moderately stout, 1–2 ft. long. Umbel 2–4-flowered; spathe-valves lanceolate, 2 in. long; pedicels 1– $1\frac{1}{2}$  in. long. Flowers bright red, ascending or horizontal; tube very short, appendiculate at the throat with minute linear scales; segments  $2\frac{1}{2}$  in. long, oblanceolate,  $\frac{1}{2}$  in. broad above the middle, subobtuse. Stamens declinate, more than half as long as the limb; anthers linear-oblong. Style declinate, as long as the limb; stigma capitate.

Hab. Hills and plains of Chili, introduced into cultivation about 1840. Received in 1872 alive from Mr. Tyerman. I cannot separate specifically *Rhodophiola Volckmanni* and *R. lata* Philippi, the latter a plant of the hills of Atacama.

#### Subgenus MACROPODASTRUM.

19. *H. SOLANDRIFLORUM* Herb. App. 31; Bot. Mag. t. 2573 & 3771; Lindl. Collect. t. 11; Lodd. Bot. Cab. t. 1200.—Bulb ovoid, 3–4 in. diam.; neck short. Leaves lorate,  $1\frac{1}{2}$  ft. long, above an inch broad. Peduncle slightly 2-edged,  $1\frac{1}{2}$ –2 ft. long. Umbel 2–4-flowered; spathe-valves lanceolate, 2–3 in. long; pedicels 1– $1\frac{1}{2}$  in. long. Perianth-limb funnel-shaped, 7–10 in. long; tube greenish-cylindrical, 4–5 in. long; segments greenish white, obovate, 4–5 in. long, 1– $1\frac{1}{2}$  in. broad. Stamens shorter than the segments; anthers linear-oblong. Style as long as the segments; stigma capitate.

Hab. North Brazil, *Burchell!* *Gardner* 3477! Guiana, *Schomburgk* 700! *Appun* 2328! Venezuela, *Fendler* 1505! Columbia, *Lehmann* 2140! Flowers in January. Introduced into cultivation in 1820.

#### Subgenus OMPHALISSA.

20. *H. AULICUM* Herb. App. 31. *Amaryllis aulica* Gawl. in Bot. Mag. t. 3311; Bury, Hexand. t. 19; Lindl. in Bot. Reg. t. 444, 1038. — Bulb ovoid, 3 in. diam.; neck short. Leaves 6–8, lorate, bright green,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$ –2 in. broad. Peduncle stout, terete,  $1\frac{1}{2}$  ft. long. Umbel generally 2-flowered; spathe-valves lanceolate, red-brown, 3–4 in. long; pedicels  $1\frac{1}{2}$ –2 in. long. Perianth-limb 5–6 in. long; tube short, with a distinct incurved green corona at the throat; segments bright crimson, green at the base; outer segments and lowest inner about an inch broad above the middle; 2 upper inner much broader. Stamens shorter than the segments; filaments bright red; anthers  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Style as long as the segments; stigma deeply trifid. Var. *stenopetalum* Bot. Reg. t. 444, has all the segments much narrower than in the type.

Hab. Central Brazil, *Gardner* 5210! *Regnell* 440! *Weir* 314! Introduced into cultivation in 1819. I cannot distinguish as species *H. Heuserianum* Karst. Fl. Columb. t. 102, gathered by Dr. Heuser at St. Paulo, *H. robustum* A. Dietr. or *Amaryllis Rougieri* Carriere in Rev. Hort. 1882, 312, with coloured figure. A form gathered by Balansa in Paraguay (529) has segments only  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad.

21. *H. ORGANENSE* Hook. in Bot. Mag. sub t. 3803. *Amaryllis aulica* var. *glaucophylla* Bot. Mag. t. 2983. *A. Gardneri* Seubert. *A. correi* Bury, Hexand. t. 9.—Bulb large; neck short. Leaves 5–6, lorate, glaucous, 1–1½ ft. long, 1½ in. broad, acute. Peduncle stout, 1½ ft. long. Umbel generally 2-flowered; spathe-valves lanceolate, 3–4 in. long; pedicels much shorter than the spathe. Perianth-limb 5–6 in. long; tube ½ in. long, funnel-shaped, with a small incurved green corona at the throat; segments bright crimson, with a green keel in the lower half, oblong, acute; outer 1½–1¾ in. broad at the middle; inner lower much narrower. Stamens nearly as long as the segments; filaments bright red; anthers linear-oblong, ⅓ in. long. Style as long as the segments; stigma deeply trifid.

Hab. South Brazil; Organ Mountains, alt. 4000–5000 ft., *Bowie* and *Cunningham*! *Gardner* 686! 688! *Glaziov* 8992! Closely allied to *H. aulicum*.

22. *H. PSITTACINUM* Herb. App. 31. *Amaryllis psittacina* Gawl. in Bot. Reg. t. 199; Lodd. Bot. Cab. t. 1204; Bury, Hexand. t. 23.—Bulb 3–4 in. diam.; neck produced. Leaves 6–8, lorate, glaucous, 1–1½ ft. long, 1–1½ in. broad. Peduncle stout, 2–3 ft. long. Umbel 2–4-flowered; spathe-valves lanceolate, longer than the pedicels. Perianth-limb 4–5 in. long; tube very short, broadly funnel-shaped, with a distinct incurved greenish red corona; segments oblong, acute, undulated, 1–1¼ in. broad, with a crimson edge, a green keel, and crimson stripes radiating from the keel. Stamens much shorter than the limb. Style shorter than the limb; stigma trifid.

Hab. South Brazil, introduced into cultivation in 1814. Flowers in spring. *H. Griffini* Herb. (Bot. Mag. t. 3528) is a fine hybrid between *psittacinum* and *Johnsoni*.

23. *H. CALYPTRATUM* Herb. App. 31. *Amaryllis calyptrata* Gawl. in Bot. Reg. t. 164; Lodd. Bot. Cab. t. 864. *A. fulvovirens* Schott. *A. unguiculata* Morren.—Bulb globose, 3 in. diam.; tunics brown; neck short. Leaves 5–6, lorate, acute, bright green, 1½–2 ft. long, 2 in. broad. Peduncle terete, green, 2 ft. long, ½–¾ in. diam. Umbel 2–3-flowered; spathe-valves lanceolate, 3 in. long; pedicels shorter than the spathe. Perianth-limb 4 in. long; tube funnel-shaped, ¾ in. long, with a distinct incurved corona at the throat; segments oblong-unguiculate, acute, 1¼–1½ in. broad, pale yellow, reticulated on the face with cross-bars of green. Stamens exerted; anthers linear-oblong, ⅓ in. long. Style exerted; stigma deeply trifid.

Hab. Brazil, *Gardner* 687! Introduced in 1816. Described from a plant flowered by Messrs. Veitch in May, 1877.

24. *H. CYBISTER* Benth. in Gen. Plant. iii. 725. *Sprekelia Cybister* Herb. in Bot. Reg. 1840, t. 33; Bot. Mag. t. 3872; Flore des Serres, t. 455–6.—Bulb ovoid, brown, 2 in. diam. Leaves produced after the flowers, lorate, green, 1–1½ in. broad. Peduncle above 2 ft. long, glaucous, subterete, purple downwards. Umbel 4–6-flowered; spathe-valves lanceolate, reddish; pedicels stout. Perianth-limb 3–4 in. long; tube very short, with an incurved

bearded neck at the throat; segments bright crimson, tinged with green towards the tip and outside, narrowed gradually from near the base to the acute point, the three upper twisted up, the three lower close together. Stamens  $1-1\frac{1}{2}$  in. longer than the segments; filaments greenish; anthers oblong,  $\frac{1}{4}$  in. long. Stigma small, minutely 3-lobed.

Hab. Andes of Bolivia. Introduced into cultivation about 1840, but now lost. Connects *Sprekelia* and *Hippeastrum*.

25. *H. PARDINUM* Dombrain in Floral Mag. t. 344. *Amaryllis pardina* Hook. fil. in Bot. Mag. t. 5645. — Bulb globose, 2-3 in. diam.; neck short. Leaves 5-7, fully developed after the flowers, lorate, bright green, finally 2 ft. long, 2 in. broad at the middle, narrowed to 1 in. near the base. Peduncle glaucous, subterete,  $1\frac{1}{2}$  ft. long. Umbel generally 2-flowered; pedicels  $1\frac{1}{2}-2$  in. long; spathe-valves lanceolate, 2 in. long. Perianth-limb 4 in. long; tube funnel-shaped, under  $\frac{1}{2}$  in. long, with a distinct incurved greenish yellow fimbriated corona at the throat; segments oblong-unguiculate, acute,  $1\frac{1}{2}-1\frac{3}{4}$  in. broad above the middle, greenish, more or less flushed and copiously minutely spotted with red, not vittate, upper broader and lowest inner narrower than the others. Stamens declinate, a little shorter than the segments; anthers  $\frac{1}{2}$  in. long. Style as long as the segments; stigma faintly 3-lobed.

Hab. Andes of Peru; discovered by Pearce; first flowered by Messrs. Veitch in 1867. Described from a plant that flowered at Kew in February, 1882, and a specimen received from M. André the same year.

#### Subgenus ASCHAMIA.

26. *H. ANDREANUM* Baker in Gard. Chron. 1880, ii. 424.—Bulb 4-4 $\frac{1}{2}$  in. diam., copiously proliferous; tunics brownish grey; neck short. Leaves lorate, developed after the flowers. Peduncle 12-15 in. long, brownish violet, slightly 2-edged. Umbel 4-6-flowered; spathe-valves 2, rose-red, lanceolate,  $1\frac{1}{2}-2$  in. long; pedicels 1-1 $\frac{1}{2}$  in. long. Perianth-limb 4 in. long; tube very short, not coronulate at the throat; segments oblanceolate-oblong, acute,  $\frac{1}{2}-\frac{3}{4}$  in. broad above the middle, pale red, with streaks of brighter red, not vittate nor distinctly keeled. Stamens  $1-1\frac{1}{2}$  in. shorter than the limb. Style longer than the stamens; stigma capitate.

Hab. Central Cordilleras of New Granada, alt. 6000-8000 ft., on the banks of one of the branches of the Rio Cauca. Discovered by M. André in 1876.

27. *H. REGINÆ* Herb. App. 31. *H. regium* Herb. *Amaryllis Reginæ* L.; Miller, Ic. t. 24; Bot. Mag. t. 453; Red. Lil. t. 9; Bury, Hexand. t. 24. — Bulb globose, 2-3 in. diam. Leaves fully developed after the flowers, 2 ft. long,  $1\frac{1}{2}$  in. broad at the middle, narrowed gradually to  $\frac{1}{2}$  in. near the base. Peduncle 1-1 $\frac{1}{2}$  ft. long. Umbel 2-4-flowered; spathe-valves lanceolate, 2-3 in. long, equalling the pedicels. Perianth-limb bright red, 4-5 in. long; tube funnel-shaped,  $\frac{1}{3}-\frac{1}{2}$  in. long; throat with a large greenish white star; segments obovate, acute,  $1-1\frac{1}{4}$  in. broad at the middle; lowest inner narrower. Stamens shorter than the limb; anthers yellow,  $\frac{1}{6}-\frac{1}{4}$  in. long. Style as long as the limb; stigma faintly 3-lobed.

Hab. Mexico and West Indies to Brazil and Peru. (Native area doubtful). *H. africanum* Welw. herb., from "aboriginal woods on Prince's Island, alt. 3500 ft.," appears to be a form of this species. *Amaryllis Alberti* Lemaire in Ill. Hort. t. 498, is probably a double-flowered form. Introduced into cultivation in 1728, and called *Lilium Reginae* by Dr. James Douglas in honour of Caroline, the wife of our George II. I have not seen the Venezuelan *H. prorum* K. Koch, nor the Peruvian *H. stenopetalum* A. Dietr., briefly noticed by K. Koch in Wockenschrift, 1874, p. 37.

28. *H. MINIATUM* Herb. App. 31. *Amaryllis miniata* Ruiz & Pavon. —Bulb ovoid, 2–3 in. diam; neck short. Leaves lorate,  $1\frac{1}{2}$ –2 ft. long, an inch broad above the middle. Peduncle 1– $1\frac{1}{2}$  ft. long. Umbel 2–4-flowered; spathe-valves lanceolate, 2 in. long; pedicels 2–3 in. long. Perianth-limb  $3\frac{1}{2}$ –4 in. long, bright red; tube  $\frac{1}{4}$  in. long, obscurely coronulate at the throat; segments obovate, subacute, 1– $1\frac{1}{4}$  in. broad; inner segments narrower than the outer, especially the lowest. Stamens a little shorter than the limb; anthers linear-oblong,  $\frac{1}{4}$  in. long. Style reaching to the tip of the segments; stigma capitate.

Hab. Andes of Peru, *Pavon!* Quebrada of Pariahuanca, *Matthews!* Not known in cultivation.

29. *H. SCOPULORUM* Baker. — Bulb ovoid, 2– $2\frac{1}{2}$  in. diam.; neck short. Leaves lorate, narrowed gradually from the middle to the base. Peduncle a foot long. Umbel 2-flowered; spathe-valves lanceolate,  $1\frac{1}{2}$ –2 in. long; pedicels as long as the spathe. Perianth-limb bright crimson,  $2\frac{1}{2}$ –3 in. long; tube very short, funnel-shaped; upper outer segment  $\frac{3}{4}$  in. broad at the middle; lower inner  $\frac{1}{2}$  in. Stamens as long as the perianth. Style a little exerted; stigma capitate.

Hab. Andes of Bolivia; Sorata, temperate region, alt. 8000–9000 ft., *Mandon* 1193! Allied to *H. Reginae* and *miniatum*.

30. *H. MANDONI* Baker. — Bulb ovoid, 2–3 in. diam. Leaves lorate, 2 ft. long, an inch broad at the middle. Peduncle stout, 1-flowered; spathe-valves lanceolate, 3–4 in. long; pedicel 2 in. long. Flower erecto-patent, bright crimson; perianth-limb 5 in. long; tube greenish, funnel-shaped,  $\frac{1}{2}$  in. long; segments obovate, acute; outer  $1\frac{1}{2}$  in. broad; upper the longest; inner all above an inch broad. Stamens much shorter than the limb; anthers yellow;  $\frac{1}{4}$  in. long. Style nearly as long as the limb; stigma capitate.

Hab. Andes of Bolivia; near Sorata, temperate region, alt. 8000–9000 ft., *Mandon* 1195! Intermediate in general appearance between *H. Reginae* and *aulicum*. It may be identical with *H. Warszewiczianum* A. Dietr., briefly described by K. Koch, Wochenschrift, 1864, 38.

31. *H. LEOPOLDI* Dombroin in Floral Mag. t. 475–6. *Amaryllis Leopoldi* Moore in Gard. Chron. 1870, 733, fig. 140.—Bulb globose, 2–3 in. diam.; neck short. Leaves lorate, finally  $1\frac{1}{2}$ –2 ft. long. Peduncle stout, subterete. Spathe-valves lanceolate. Perianth-limb the most regular of all the species, 5 in. long, 6–7 in. diam. when fully expanded; tube short, without any distinct incurved corona at the throat; segments obovate, 2 in. broad, white towards the tip, bright red at the middle, with a bifid white keel in the lower half of the red, and a large greenish white throat. Stamens declinate, rather shorter than the segments; filaments white;

anthers purplish, above  $\frac{1}{2}$  in. long. Style longer than the stamens; stigma capitate.

Hab. Andes of Peru, discovered by Pearce. First flowered by Messrs. Veitch in 1869, and named in honour of Leopold, King of the Belgians.

32. *H. PROCERUM* Lemaire in Ill. Hort. xi. 408. *Amaryllis pro-cera* Duchartre; Flore des Serres, t. 2077-8. *A. Rayneri* Hook. fil. in Bot. Mag. t. 5883.—Bulb large, ovoid, with a long neck. Leaves about a dozen, distichous, falcate, ensiform, finally 2-3 ft. long,  $1\frac{1}{2}$ -2 in. broad, firm in texture, cartilaginous on the edge. Peduncle 1- $1\frac{1}{2}$  ft. long, much compressed, ancipitous, shorter than the leaves,  $1-1\frac{1}{4}$  in. diam. Umbel 4-12-flowered; spathe-valves 2-3 in. long, exceeding the pedicels. Perianth-limb 5-6 in. long, lilac, not starred at the throat; tube very short; segments oblanceolate, acute, under an inch broad. Stamens much shorter than the limb; anthers yellow,  $\frac{1}{2}$  in. long. Stigma capitate.

Hab. South Brazil, near Petropolis. Introduced by Binot about 1863, in which year it was described by Duchartre. Very distinct.

33. *H. EQUESTRE* Herb. App. 31. *Amaryllis equestris* Ait.; Jacq. Hort. Schoen. t. 63; Bot. Mag. t. 305; Red. Lil. t. 32. *A. punicea* Lam. *H. occidentale* Roem. *A. Belladonna* Swartz, non Linn.—Bulb stoloniferous, globose, 2 in. diam.; tunics brown; neck short. Leaves 6-8, fully developed after the flowers, lorate, bright green,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$ - $1\frac{3}{4}$  in. broad, narrowed gradually to the point. Peduncle terete, rather glaucous,  $1\frac{1}{2}$ -2 ft. long. Umbel 2-4-flowered; spathe-valves green, lanceolate; pedicels 2-3 in. long. Perianth-limb 4-5 in. long, 4 in. diam. when expanded; tube green, an inch long, obscurely coronulate at the throat; base of the segments yellowish green; upper part bright red; 3 outer  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. broad; 3 inner narrower, especially the lowest. Stamens shorter than the segments; anthers small, oblong. Stigma obscurely 3-lobed.

Hab. Throughout Tropical America from Mexico and the West Indies to Chili and Brazil. Var. *major* Bot. Reg. t. 234; Bury, Hexand. t. 41, is a form with very large flowers. The species was first noticed by Hermann in 1698. Described from plants that flowered at Kew in 1873 and 1879. I cannot find any specific character by which to distinguish *A. Roezli* Regel in Gartenflora, 1874, 290, t. 809, gathered by Roezl in the Andes of Bolivia. *H. barbatum* Herb. (*Crinum barbatum* Linn. herb.) is apparently not more than a white-flowered variety of this species. *H. pyrochromum* Lemaire in Ill. Hort. t. 420, and *H. spathaceum* Sims in Bot. Mag. t. 2315, are probably both also varieties.

34. *H. RETICULATUM* Herb. in Bot. Mag. sub t. 2475. *Amaryllis reticulata* L'Herit. Sert. Angl. 12, t. 14; Bot. Mag. t. 657; Andr. Bot. Rep. t. 179; Red. Lil. t. 424. *Coburgia reticulata* Herb. *Leopoldia reticulata* Herb.—Bulb subglobose; neck short. Leaves 4-6, thin, oblanceolate, bright green, 2 in. broad above the middle, narrowed gradually to the base. Peduncle nearly terete, a foot long. Umbel 3-5-flowered; spathe-valves lanceolate, 2 in. long; pedicels  $1-1\frac{3}{4}$  in. long. Perianth-limb  $3\frac{1}{2}$ -4 in. long; tube  $\frac{1}{2}$ -1 in. long, not coronulate at the throat; segments obovate-unguiculate, connivent in the lower half, an inch broad at the middle, bright mauve-red, with copious cross-bars of a deeper shade. Stamens

shorter than the perianth. Stigma faintly 3-lobed. Seeds fewer and less compressed than in the other species.

Var. *H. STRIATIFOLIUM* Herb. *Amaryllis reticulata* var. *striatifolia* Herb. in Bot. Mag. t. 2513; Bot. Reg. t. 352; Bury, Hexand. t. 48. — Leaves broader, with a distinct white keel. Perianth-segments hardly at all reticulated with cross-bars.

Hab. South Brazil. There is a specimen at the British Museum, dried from the gardens of Messrs. Lee, of Hammersmith, in 1781. It was introduced in 1777. The only indigenous specimens I have seen were gathered by Burchell in March, 1826, on the shores of Botafogo Bay and near the village of Sao Domingas.

35. *H. STYLOSUM* Herb. in Bot. Mag. t. 2278. *Amaryllis stylosa* Bury, Hexand. t. 33. *A. maranensis* Gawl. in Bot. Reg. t. 719. *A. staminea* Seub. — Bulb globose, 3 in. diam. Leaves 4–6, bright green, lorate,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. broad. Peduncle  $1\frac{1}{2}$  ft. long. Umbel 3–8-flowered; spathe-valves lanceolate; pedicels 1–2 in. long. Perianth-limb 4 in. long, bright flesh-red; tube  $\frac{1}{2}$  in. long, obscurely fimbriate at the throat; segments oblong, acute, under an inch broad. Stamens a little exerted; anthers linear-oblong,  $\frac{1}{4}$  in. long. Style much exerted; stigma capitate.

Hab. Guiana and North Brazil, *Burchell* 9819! *Gardner* 1167! Introduced by Lord Carnarvon from Marantham in 1821. Described from a plant flowered by Messrs. Backhouse in May, 1878.

#### Subgenus LAIS.

36. *H. RUTILUM* Herb. App. 41. *Amaryllis rutila* Gawl. in Bot. Reg. t. 23; Lodd. Bot. Cab. t. 1449. *H. bulbulosum* var. *rutilum* Herb. — Bulb subglobose, stoloniferous, 2–3 in. diam.; neck short; tunics pale. Leaves 6–8, lorate, bright green, a foot long, above an inch broad. Peduncle glaucous, slightly compressed, a foot long. Umbel 2–4-flowered; spathe-valves lanceolate,  $1\frac{1}{2}$  in. long; pedicels slender, as long as the spathe. Perianth-limb 3–4 in. long; tube green, cylindrical,  $\frac{3}{4}$  in. long, obscurely coronulate at the throat; segments oblong, acute, bright crimson, with a green keel extending halfway up,  $\frac{3}{4}$ –1 in. broad at the middle, the lower inner narrower. Stamens shorter than the segments; filaments red; anthers linear-oblong,  $\frac{1}{4}$  in. long. Style as long as the limb; stigma trifid.

Var. *H. FULGIDUM* Herb. *Amaryllis fulgida* Gawl. in Bot. Reg. t. 226; Bury, Hexand. t. 26. *A. miniata* Sims in Bot. Mag. t. 1943; Bury, Hexand. t. 35, non R. & P. *A. brasiliensis* Tratt. Tab. t. 333. *H. subbarbatum* Herb. in Bot. Mag. t. 2475. *H. bulbulosum*, vars. *subbarbatum*, *unguiculatum*, *fulgidum*, *Simsianum*, and *equestriforme* Herb. — More robust. Bulb 3–4 in. diam. Leaves broader. Perianth-limb 4–5 in. long; tube 1 in. long; segments bright scarlet, with a green base and keel in the lower half, more ovate, 3–4 in. long, outer 1– $1\frac{1}{4}$  in., inner lower about  $\frac{3}{4}$  in. broad.

Var. *H. CROCATUM* Herb. *Amaryllis crocata* Gawl. in Bot. Reg. t. 38. — Habit as robust and leaves as broad as in *fulgidum*, but flower smaller, saffron-coloured, with more undulated segments.

Var. *CITRINUM* Baker. *Amaryllis crocata* Bury, Hexand. t. 16. — Flower bright yellow.

Var. *H. ACUMINATUM* Roem. *Amaryllis acuminata* Gawl. in Bot. Reg. t. 534 & 1188. *A. pulverulenta* Lodd. Bot. Cab. t. 484; Bury, Hexand. t. 45. *H. pulverulentum* Herb. in Bot. Mag. t. 2273.—Flowers pale pink; segments very acute.

Hab. South Brazil, especially about Rio Janeiro, *Miers* 3123! 3598! *Glaziou* 8991! *Tweedie*! *Vauthier*! *H. Martianum* and *bahiense* Roem., and *H. glaucescens* Herb. appear to be also varieties of this very variable species. Introduced into cultivation about 1810.

37. *H. VITTATUM* Herb. App. 31. *Amaryllis vittata* Ait.; Bot. Mag. t. 129; L'Herit. Sert. t. 15; Red. Lil. t. 10; Bury, Hexand. t. 32 & 40. — Bulb globose, 2–3 in. diam. Leaves 6–8, lorate, bright green, 1½–2 ft. long. Peduncle 2–3 ft. long. Umbel 2–6-flowered; spathe-valves lanceolate, 2–3 in. long; pedicels as long as the spathe. Perianth-limb 4–6 in. long; tube funnel-shaped, an inch long, obscurely coronulate at the throat; segments obovate-oblong, acute, 1–1½ in. broad, white towards the edge and distinctly keeled with white, striped with bright mauve-red between the keel and edge; expanded limb 3–5 in. diam. Stamens shorter than the perianth-limb; anthers linear-oblong, ¼ in. long. Style as long as the limb; stigma deeply trifid.

Hab. Andes of Peru, introduced into Europe in 1769. There is a specimen at the British Museum dried from the garden of Mr. Malcolm in 1777. Flowers in April and May. It varies much in the size of the flower and distinctness of the stripes. Var. *minor* Bury, Hexand. t. 40, has a perianth 4 in. long. Var. *Harrisonæ* Lindl. Bot. Reg. t. 988, is probably a hybrid between *vittatum* and *solandriflorum* (Bury, Hexand. t. 27).

38. *H. BREVIFLORUM* Herb. Amaryll. 137, t. 21, fig. 4; Bot. Mag. t. 3549. — Bulb ovoid, 2–3 in. diam. Leaves lorate, green, 1½ ft. long, 1¼–1½ in. broad. Peduncle terete, glaucous, 2–3 ft. long. Umbel 5–6-flowered; spathe-valves lanceolate; pedicels slender, 2–3 in. long. Perianth-limb 2½ in. long, funnel-shaped; tube very short; segments oblanceolate-oblong, subacute, white, keeled with red, the outer ¾ in. broad above the middle, the lowest inner ½ in. Stamens shorter than the limb; anthers small, oblong. Style shorter than the limb; stigma trifid.

Hab. Buenos Ayres, *Tweedie*! First flowered in cultivation at Glasgow in April, 1836.

#### Hybrids.

The broad-leaved species of *Hippeastrum* hybridise with great facility, and the original hybrids can be easily intercrossed. Since the year 1799, when *H. Regina* was first crossed with *H. vittatum* by a watchmaker of Prescott, in Lancashire, called Johnson, after whom the hybrid was named, a very large number of beautiful types have been produced. About 100 of these, with Latin names, are enumerated, and their parentage given in the second edition of Sweet's 'British Flower Garden,' in 1830.\* Up to that time the

\* See also Herbert, Amaryll. 335; Trans. Hort. Soc. iii. 196, iv. 42; Journ. Hort. Soc. ii. 19; Gowen in Trans. Hort. Soc. iv. 498; Lindley in Trans. Hort. Soc. v. 337; Kunth, Enum. v. 529; Miss Rosenberg's 'Corona Amaryllidæa,' published at Bath in 1839, with coloured plates of five hybrids; Dietrich in Berlin Gartenzeit. 1884, 121; K. Koch, Wochenschrift, 1864, 17, 30, 37; Goldring in Garden, 1883, 193; Douglas in Garden, 1887, 250, t. 614; and G. Don in Sweet, Brit. Flow. Gard. ed. 3, pp. 671–675.

principal species crossed were *Reginæ*, *reticulatum*, *vittatum*, *aulicum*, and *solandriiflorum*; and rarely *equestre*, *psittacinum*, *fulgidum*, and *stylosum*. Since 1870 *pardinum* and *Leopoldi* have been largely used, especially the latter. I will only attempt here to enumerate a few of the hybrid types which have been figured or to which Latin names have been given.

Forms nearest *Reginæ*:—*Johnsoni* Bury, Hexand. t. 1; *brasiliensis* Red. Lil. t. 469; *Gravina* Melazzo; *Carnarvonia* A. DC. Pl. Rar. Hort. Genev. t. 9; *spectabile* Lodd. Bot. Cab. t. 159.

Forms nearest *aulicum*:—*Ackermanni*; *Ackermanni pulcherrima* Moore, Mag. 1850, ii. 5; *Chelsoni* Floral Mag. t. 545; *Mendeli* Floral Mag. n. s. t. 167; also Floral Mag. t. 97, and new series, tabs. 77, 347, and 359.

Forms nearest *reticulatum*:—*Sweetii*, *Colvillei*, *præclara*, *formosa*, *gloriosa*, and *Goweni*. Recent forms, Flore des Serres, t. 2427; Floral Mag. t. 383, and new series, tabs. 22 and 153.

Forms nearest *solandriiflorum*:—Crossed with *vittatum* it gives *ambiguum* Bot. Mag. t. 3542; also forms figured Bot. Reg. t. 876, and Gartenflora, tabs. 949 and 956; also *picta* Bury, Hexand. t. 5, a fine cross with *Johnsoni*, figured Bury, Hexand. t. 46, *Harrisoni* Bury, Hexand. t. 21, and *marginata*, *Croomii*, *Haylocki*, *Herberti*, and *Carnarvoni*.

*Vittatum* has been largely crossed with the four foregoing species.

*Pardinum* gives the spotted types in Veitch's recent hybrids. A fine cross between this and *Leopoldi* is figured Gard. Chron. 1877, fig. 136.

Forms near *Leopoldi*:—A form very near the type is *Hendersoni* Floral Mag. n. s. t. 117. The best hybrids recently raised by Mr. Heal for Messrs. Veitch at the present day have an open regular flower, with scarcely any tube and much imbricated segments, derived from *Leopoldi*, combined with a brilliant scarlet colour, probably derived from *Reginæ* through *Johnsoni*.

## 22. VALLOTA Herb.

*Perianth* erect, with a long broadly funnel-shaped tube and 6 equal ascending oblong connivent segments, with a pulvinate callus at the base. *Stamens* inserted below the throat of the perianth-tube; filaments filiform; anthers oblong, versatile. *Ovary* 3-celled; ovules many, superposed; style filiform; stigma capitate. *Capsule* ovoid-oblong, obtusely angled, loculicidally 3-valved. *Seeds* black, compressed, produced into a wing at the base.

1. V. PURPUREA Herb. App. 29. *Amaryllis purpurea* Ait.; Gawl. in Bot. Mag. t. 1430. *A. speciosa* L'Herit. *Crinum speciosum* Linn. fil. — Bulb large, ovoid. Leaves subdistichous, lorate, contemporary with the flowers, finally 1½–2 ft. long, dying down in autumn. Peduncle hollow, slightly 2-edged, 2–3 ft. long. Umbel 6–9 flowered; spathe-valves oblong-lanceolate, 2–3 in. long; pedicels shorter. Flowers erect, bright scarlet; tube longer than the segments, ¾ in. diam. at the throat; segments about 2 in. long, 1 in. broad. Stamens reaching halfway up the segments. Style

reaching to the tip of the segments. *V. elata* Roem. (*Amaryllis elata* Jacq. Hort. Schoen. i. t. 62) is a form with smaller cherry-red flowers. Var. *minor* Ker in Bot. Reg. t. 552, is a similar form. Var. *magnifica* Hort. is a form with large bright scarlet flowers, with a whitish throat.

Hab. Cape Colony; Southern provinces. Introduced into cultivation by Masson in 1774. There is a white-flowered variety. *Cyrtanthus hybridus* N. E. Brown in Gard. Chron. 1885, vol. xxiv. p. 391, is a hybrid between *Vallota* and *Cyrtanthus sanguineus*, most resembling the former.

### 23. CYRTANTHUS Ait.

*Perianth* funnel-shaped, with a narrow tube with a naked throat, two or three times the length of the oblong segments. *Stamens* inserted below the throat of the perianth-tube; filaments filiform, sometimes very short; anthers oblong, dorsifixed, versatile. *Ovary* 3-celled; ovules numerous, superposed; style long, filiform; stigma distinctly or indistinctly 3-lobed. *Capsule* oblong, loculicidally 3-valved. *Seeds* flat, black, produced into a wing at the base.—*Rootstock* a tunicated bulb. *Leaves* persistent, linear or lorate. *Peduncle* hollow. *Flowers* erect or pendulous, usually red or white, with green stripes. *Spathe-valves* 2-4, green, lanceolate.

Subgenus CYRTANTHUS PROPER. Flowers many in an umbel, pendulous. Leaves lorate. . Sp. 1-3.

Subgenus MONELLA. Flowers many in an umbel, usually pendulous. Leaves linear.

Flowers red . . .	Sp. 4-13.
Flowers white . . .	Sp. 14.
Flowers yellow . . .	Sp. 15.

Subgenus GASTRONEMA. Flowers 1 or few in an umbel, erect or slightly decurved. Perianth-tube more open.

Leaves linear . . .	Sp. 16-19.
Leaves lanceolate . . .	Sp. 20.

1. *C. OBLIQUUS* Ait. Hort. Kew. i. 414; Jacq. Hort. Schoen. i. t. 75; Andr. Bot. Rep. t. 265; Bot. Reg. t. 1133; Red. Lil. t. 381. *Crinum obliquum* Linn. fil. *Agapanthus Umbrella* L'Herit. — Bulb ovoid, 3-4 in. diam. Leaves 10-12, lorate, distichous, produced after the flowers, 1½-2 ft. long. Peduncle stout, subterete, mottled, 1-2 ft. long. Flowers 10-12 in an umbel, very drooping, bright red, with a yellowish base, inodorous, 2-3 in. long; pedicels ½-1 in.; spathe-valves usually 4, lanceolate, reflexing. Perianth-tube curved, twice as long as the oblong segments, ⅓-½ in. diam. at the throat. Stamens biseriate; filaments short, an inch long. Style reaching to the tip of the segments; stigma capitate.

Hab. Cape Colony; Southern provinces. Flowers in May and June. Introduced into cultivation by Masson in 1774.

2. *C. CARNEUS* Lindl. in Bot. Reg. t. 1462.—Bulb ovoid, 2-3 in. diam. Leaves 8-10, lorate, produced after the flowers, glaucous,

twisted,  $1\frac{1}{2}$  ft. long. Peduncle subterete, glaucous, a foot or more long. Flowers 8-10 in an umbel, very cernuous, bright red,  $2-2\frac{1}{2}$  in. long; pedicels short; spathe-valves 3-4, lanceolate; tube twice as long as the oblong segments,  $\frac{1}{8}$  in. diam. at the throat. Stamens inserted in the tube; filaments an inch long. Style reaching to the tip of the segments; stigma capitate.

Hab. Cape Colony; Southern provinces, *Drége!* *Thom!* *Macowan* 2619! Closely allied to *C. obliquus*.

3. *C. HUTTONI* Baker. — Leaves lorate, contemporary with the flowers, a foot long,  $\frac{1}{2}-\frac{3}{4}$  in. broad. Peduncle moderately stout, above a foot long. Umbel 6-8-flowered; spathe-valves 2, oblong-lanceolate,  $1\frac{1}{2}$  in. long; pedicels erect,  $\frac{1}{2}-1$  in. long. Perianth pale red, about an inch long including the ovary; tube curved, narrowly funnel-shaped,  $\frac{1}{8}-\frac{1}{6}$  in. diam. at the throat, twice as long as the oblong segments. Stamens biseriate; filaments very short. Style reaching halfway up the limb; stigma tricuspidate.

Hab. Cape Colony; Province of Albany, *Hutton!* Described from a plant that flowered at Kew in May, 1864.

#### Subgenus MONELLA (*Herb.*).

4. *C. BRACHYSCYPHUS* Baker. — Bulb ovoid. Leaves about 3, contemporary with the flowers, linear, 9-10 in. long. Scape slender, terete, glaucous, as long as the leaves. Umbel 6-8-flowered; spathe-valves 2, lanceolate, an inch long; pedicels  $\frac{1}{2}-\frac{3}{4}$  in. long. Flowers pale red; tube narrowly funnel-shaped,  $\frac{1}{6}$  in. diam. at the throat, a little longer than the oblong-lanceolate segments. Stamens inserted near the throat of the tube; filaments  $\frac{1}{8}$  in. long. Style overtopping the anthers.

Hab. Port Grosvenor, Pondo-land. Described from a specimen sent by Mr. Tillet, of Sprowston, near Norwich, in July, 1886.

5. *C. WELWITSCHII* Hiern; Baker in Journ. Bot. 1878, 197. — Bulb ovoid, 1 in. diam. Leaves about 4, contemporary with the flowers, linear, glaucous,  $1-1\frac{1}{2}$  ft. long,  $\frac{1}{4}-\frac{1}{3}$  in. broad. Peduncle slender, as long as the leaves. Umbel 3-8-flowered; spathe-valves 2, lanceolate,  $1\frac{1}{2}-2$  in. long; pedicels slender, erect,  $1-1\frac{1}{2}$  in. long. Perianth red, erect,  $1\frac{1}{4}-1\frac{1}{2}$  in. long; tube funnel-shaped,  $\frac{1}{6}-\frac{1}{4}$  in. diam. at the throat, rather longer than the oblong-lanceolate segments. Stamens biseriate; filaments short; anthers oblong. Style reaching halfway up the limb; stigma tricuspidate. Capsule-valves oblong,  $\frac{3}{4}$  in. long.

Hab. Mountains of Angola, subtemperate region, *Welwitsch!* *H. H. Johnston!*

6. *C. SPIRALIS* Burchell; Gawl. in Bot. Reg. t. 167. *Monella spiralis* Herb. — Bulb ovoid,  $1\frac{1}{2}$  in. diam. Leaves 2-3, produced after the flowers, linear, weak, spirally-twisted, glaucous, 6-9 in. long. Peduncle slender, glaucous, a foot long. Umbel 4-6-flowered; spathe-valves 2, lanceolate, an inch long; pedicels ascending,  $\frac{1}{2}-1$  in. Flowers bright red, inodorous,  $1\frac{1}{2}-2$  in. long; tube curved,  $\frac{1}{8}$  in. diam. at the throat; segments oblong,  $\frac{1}{3}$  in. long.

Stamens inserted near the throat of the tube; filaments  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Style overtopping the stamens; stigma tricuspidate.

Hab. Cape Colony; Province of Uitenhage, *Burchell*! *Zeyher* 347! Flowers in November.

7. *C. COLLINUS* Burchell; Gawl. in Bot. Reg. t. 162. *Monella glauca* Herb. *M. collina* Salisb.—Bulb ovoid,  $1\frac{1}{2}$  in. diam. Leaves about 3, produced with the flowers, linear, weak, not twisted, 6–9 in. long. Peduncle slender, terete, a foot long. Umbel 6–10-flowered; spathe-valves 2, lanceolate; pedicels slender, suberect,  $\frac{1}{2}$ –1 in. long. Perianth bright red,  $1\frac{1}{2}$ –2 in. long; tube narrowly funnel-shaped, very slender in the lower half,  $\frac{1}{4}$  in. diam. at the throat; segments oblong,  $\frac{1}{3}$  in. long. Stamens almost uniseriate, inserted near the throat of the tube; filaments very short. Style reaching halfway up the limb; stigma tricuspidate.

Hab. Cape Colony; Uitenhage, *Burchell* 7783! Zuur-berg, *Cooper* 3223! Flowers in August.

8. *C. RECTIFLORUS* Baker. — Bulb ovoid,  $1\frac{1}{2}$  in. diam. Leaves 2, contemporary with the flowers, linear, straight, green. Peduncle slender, 1– $1\frac{1}{2}$  ft. long. Umbel 8–10-flowered; spathe-valves 2, lanceolate; pedicels  $\frac{3}{4}$ –1 in. long. Perianth straight, red, erect, about an inch long; tube narrowly funnel-shaped,  $\frac{1}{8}$  in. diam. at the throat; segments oblong, half as long as the tube. Stamens biseriate; filaments very short; upper three anthers  $\frac{1}{4}$  in. above the others. Style reaching to the tip of the segments; stigma obscurely tricuspidate.

Hab. British Kaffraria; Perie Bush. Discovered by Mr. Tidmarsh, Curator of the Grahamstown Botanic Garden.

9. *C. PALLIDUS* Sims in Bot. Mag. t. 2471.—Bulb ovoid,  $1\frac{1}{2}$  in. diam. Leaves 4–5, produced after the flowers, linear, green, not twisted. Peduncles subterete, purplish,  $\frac{1}{2}$  ft. long. Umbel 4–5 flowered; spathe-valves 2, lanceolate; pedicels  $\frac{1}{2}$ –1 in. long. Perianth pale red,  $1\frac{1}{2}$  in. long; tube narrowly funnel-shaped,  $\frac{1}{4}$  in. diam. at the throat; segments oblong,  $\frac{1}{2}$  in. long. Stamens and style a little exerted from the tube.

Hab. Cape Colony. Known to me only by the figure cited, which was drawn from a garden plant introduced by Villet in 1822.

10. *C. MACOWANI* Baker in Gard. Chron. 1875, 95; Regel Gartenfl. t. 960.—Bulb ovoid, 1 in diam. Leaves 1–3, contemporary with the flowers, linear, green, not twisted,  $\frac{1}{2}$ –1 ft. long. Peduncle slender, terete, a foot long. Umbel 6–8 flowered; spathe-valves 2, lanceolate, 1– $1\frac{1}{2}$  in. long; pedicels  $\frac{1}{8}$ – $\frac{3}{4}$  in. Perianth bright scarlet,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long; tube curved, narrowly funnel-shaped,  $\frac{1}{8}$  in. diam. at the throat; segments ovate, cuspidate,  $\frac{1}{8}$ – $\frac{1}{4}$  in. long. Stamens biseriate; filaments very short. Style just exerted from the perianth-tube; stigma tricuspidate.

Hab. Eastern provinces of Cape Colony, ascending to 5000 ft. on the Boschberg. Introduced into cultivation by Prof. Macowan in 1875.

11. *C. ODORUS* Gawl. in Bot. Reg. t. 503.—*Monella odora* Herb. *Eusipho odora* Salisb.—Bulb ovoid,  $1\frac{1}{2}$  in. diam. Leaves 2–3,

linear, green, straight, a foot long. Peduncle slender,  $\frac{1}{2}$ –1 ft. long. Umbel 4–10-flowered; spathe-valves 2, lanceolate, green,  $1\frac{1}{2}$ –2 in. long; pedicels shorter. Flowers bright red, fragrant, 2 in. long; tube subcylindrical,  $\frac{1}{8}$  in. diam. at the throat; segments linear-oblong,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Stamens almost uniseriate, inserted near the throat of the tube; filaments very short. Style sometimes protruded beyond the tip of the perianth-segments; stigma distinctly bicuspidate.

Hab. Cape Colony and Natal. Introduced into cultivation in 1818, by Messrs. Colville, of the King's Road, Chelsea. Flowers in July and August.

12. *C. TUCKER* Baker in Journ. Bot. 1876, 183.—Bulb ovoid,  $1\frac{1}{2}$  in. diam.; neck produced. Leaves 2, contemporary with the flowers, linear, green, 1– $1\frac{1}{2}$  ft. long. Peduncle as long as the leaves. Umbel 10–12-flowered; spathe-valves 2, lanceolate, green, 3– $3\frac{1}{2}$  in. long; pedicels 1– $2\frac{1}{2}$  in. Flowers yellowish at the base, passing upwards into blood-red,  $1\frac{1}{2}$ –2 in. long; tube curved, narrowly funnel-shaped,  $\frac{1}{3}$  in. diam. at the throat; segments oblong,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long, not spreading. Stamens biseriate, the three lower not exerted from the perianth-tube. Style just overtopping the upper anthers; stigma tricuspidate.

Hab. Cape Colony; summit of the Boschberg, alt. 4000–5000 ft., *Macowan* 2133! Sent alive from Glasnevin in July, 1884, by Mr. F. Moore.

13. *C. ANGUSTIFOLIUS* Ait. Hort. Kew, i. 414; Bot. Mag. t. 271; Lodd. Bot. Cab. t. 368; Red. Lil. t. 388. *Crinum angustifolium* Linn. fil. *Amaryllis cylindracea* L'Herit. *Monella angustifolia* Herb. *Eusipho angustifolius* Salisb.—Bulb ovoid,  $1\frac{1}{2}$ –2 in. diam. Leaves 2–3, contemporary with the flowers, linear, green, straight, 1– $1\frac{1}{2}$  ft. Peduncle as long as the leaves. Umbel 4–10-flowered; spathe-valves 2, lanceolate,  $1\frac{1}{2}$ –2 in. long; pedicels 1– $1\frac{1}{2}$  in. long. Perianth bright red, inodorous,  $1\frac{1}{2}$ –2 in. long; tube narrowly funnel-shaped,  $\frac{1}{6}$  in. diam. at the throat; segments oblong,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Stamens all exerted from the tube; filaments  $\frac{1}{8}$ – $\frac{1}{4}$  in. Style sometimes protruded beyond the tip of the segments; stigma tricuspidate.

Var. *GRANDIFLORUS* Baker.—Perianth  $2\frac{1}{2}$ –3 in. long; throat of the tube  $\frac{1}{4}$  in. diam.

Var. *C. VENTRICOSUS* Willd. Sp. Plant. ii. 49. *C. angustifolius* Jacq. Hort. Schoen. i. t. 76.—Perianth-tube more dilated, ventricose in the middle and contracted at the throat.

Var. *C. STRIATUS* Herb. in Bot. Mag. t. 2534.—Perianth  $2\frac{1}{2}$  in. long, bright red, with yellow ribs.

Hab. Cape Colony and Natal. Introduced into cultivation by Masson, in 1774. Flowers in autumn.

14. *C. MACKENII* Hook. fil in Gard. Chron. 1869, 3641, with figure; Baker in Saund. Ref. Bot. t. 355.—Bulb ovoid,  $1\frac{1}{2}$  in. diam. Leaves 2–6, contemporary with the flowers, linear, green, straight, a foot long. Peduncle slender, subterete, slightly glaucous, a foot long. Umbel 4–10-flowered; spathe-valves lanceolate, greenish, 1– $1\frac{1}{2}$  in. long. Flowers pure white, 2 in. long; tube narrowly funnel-shaped,  $\frac{1}{8}$  in. diam. at the throat; segments oblong,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Stamens distinctly biseriate; filaments very short. Style exerted from the tube; stigma tricuspidate.

Hab, Natal. Introduced by McKen about 1868. Flowers all through winter and spring. Now common in cultivation.

15. *C. LUTESCENS* Herb. Amaryll. 129, t. 33, fig. 14. *Monella ochroleuca* Herb.—Bulb globose, 1 in. diam. Leaves 2-4, produced with or after the flowers, linear, green, not twisted, a foot long. Peduncle slender, a foot long. Umbel 2-3-flowered; spathe-valves lanceolate, green, an inch long; pedicels shorter. Flowers yellow, 2 in. long; tube slightly curved, very slender in the lower half,  $\frac{1}{6}$  in. diam. at the throat; segments oblong,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long. Stamens distinctly biseriate; filaments very short. Style exerted from the tube; stigma tricuspidate.

Var. *COOPERI* Baker. *C. lutescens* Hook. in Bot. Mag. t. 5374.—Flowers more numerous. Pedicels and spathe-valves longer. Perianth-segments more spreading, ovate,  $\frac{1}{8}$ - $\frac{1}{6}$  in. long.

Hab. Cape Colony, Eastern provinces, Natal, and Transvaal. Introduced into cultivation by Mr. T. Cooper in 1863.

### Subgenus GASTRONEMA (*Herb.*)

16. *C. UNIFLORUS* Gawl. in Bot. Reg. t. 168. *Amaryllis clavata* L'Herit. *A. humilis* Link. *Gastronema clavatum* Herb. in Bot. Mag. t. 2291.—Bulb globose,  $\frac{3}{4}$ -1 in. diam.; neck short. Leaves 1-2, linear, contemporary with the flowers,  $\frac{1}{2}$  ft. long, not twisted. Peduncle slender, 6-9 in. long. Umbel 1-3-flowered; spathe-valves lanceolate, green, 1-1 $\frac{1}{2}$  in. long; pedicel short if the flower be solitary. Flower erect or suberect, 1 $\frac{1}{2}$ -2 in. long, white, with green or reddish-brown stripes; tube funnel-shaped,  $\frac{1}{3}$ - $\frac{1}{2}$  in. diam. at the throat; segments oblong,  $\frac{1}{2}$ - $\frac{3}{4}$  in. diam. at the throat. Stamens biseriate; filaments erect or incurved,  $\frac{1}{4}$  in. long. Style overtopping the anthers; stigma with 3 falcate branches.

Hab. Throughout Cape Colony and Kaffraria. Flowers from September to January.

17. *C. HELICTUS* Lehm. Delect. Sem. Hort. Hamburg, 1839, 7. *Cyphonema Loddigesianum* Herb.—Differs from the last mainly by its spirally twisted leaves.

Hab. Cape Colony, Eastern provinces.

18. *C. VITTATUS* Desf.; Red. Lil. t. 182.—Bulb globose, 1 $\frac{1}{2}$  in. diam. Leaves 5-6, linear, contemporary with the flowers, not twisted. Umbel 5-6-flowered; spathe-valves 2, lanceolate, 1 $\frac{1}{2}$  in. long; pedicels very short. Flowers about 3 in. long, white, striped with red-brown; tube slender in the lower half, dilated gradually to a throat  $\frac{1}{2}$  in. diam. Stamens exerted from the perianth-tube. Style overtopping the stamens; stigma tricuspidate.

Hab. Cape Colony. Known to me only from the figure cited.

19. *C. SMITHIANUS* Herb. in Bot. Mag. sub t. 3779.—Bulb ovoid, 1 $\frac{1}{2}$  in. diam. Leaves 2-4, contemporary with the flowers, linear, spirally twisted, rather glaucous, 6-9 in. long. Peduncle slender, terete,  $\frac{1}{3}$  ft. long. Umbel 1-2-flowered; spathe-valves 2, lanceolate; pedicels 1-1 $\frac{1}{2}$  in. long. Flowers 1-2, erect, white striped with green or red-brown, 3 $\frac{1}{2}$ -4 in. long; tube gradually

dilated from the base to a throat an inch in diameter; segments oblong, an inch long. Stamens biseriate; filaments  $\frac{1}{2}$  in. long; stigma tricuspidate.

Hab. Kaffraria. Described from a living plant sent by the late Prof. Balfour from the Edinburgh Botanic Garden, in May, 1876.

20. *C. SANGUINEUS* Hook. in Bot. Mag. t. 5218. *Gastronema sanguineum* Lindl.—Bulb ovoid, 2 in. diam. Leaves 3-4, contemporary with the flowers, bright green, lanceolate, petioled, a foot long,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad. Peduncle slender, terete, 6-9 in. long. Umbel 1-3-flowered; spathe-valves lanceolate, 2-4 in. long; pedicels erect. Flowers bright red, 3-4 $\frac{1}{2}$  in. long; tube sub-cylindrical in the lower half, openly funnel-shaped in the upper; throat an inch in diameter; segments ovate, falcate, 1-2 in. long. Stamens nearly uniseriate; filaments incurved,  $\frac{1}{2}$  in. long. Style overtopping the anthers; stigma falcate,  $\frac{1}{4}$  in. long.

Hab. Kaffraria and Natal, flowering in August. Introduced into cultivation by Messrs. Backhouse in 1860. Also Galla Country, East Tropical Africa, gathered by the Rev. T. Wakefield. A very distinct species.

#### 24. GRIFFINIA *Ker.*

*Perianth* funnel-shaped, horizontal or declinate; tube none or very short, not appendiculate at the throat; segments acute, three lower narrower than the three upper. *Stamens* declinate, unequal, attached to the base of the segments; anthers small, oblong, versatile. *Ovary* 3-celled; ovules 2 in a cell, collateral, basal; style filiform, declinate; stigma capitate, rarely trifold. *Capsule* loculicidally 3-valved. *Seeds* often solitary; testa pale.—*Rootstock* a truncated bulb. *Leaves* thin, broad, usually petioled. *Peduncle* solid. *Umbel* many-flowered; spathe-valves 2, lanceolate; flowers lilac.

Leaves petioled. Stamens 6.

Stigma capitate . . . . . Sp. 1-5.

Stigma tricuspidate . . . . . Sp. 6.

Leaves sessile. Upper stamen suppressed . Sp. 7.

1. *G. DRYADES* Roem. Amarayll. 32; Hook. fil in Bot. Mag. t. 5786. *Amaryllis dryades* Vell. Fl. Flum. iii. t. 117.—Bulb as large as a man's fist. Leaves firmer in texture than in the other species; bright green, above a foot long, 5-6 in. broad, cuneately narrowed to a channelled petiole 6-8 in. long. Peduncle stout, 1 $\frac{1}{2}$ -2 ft. long. Umbel 10-12-flowered; spathe-valves 1 $\frac{1}{2}$  in. long; pedicels about an inch long. *Perianth*-limb 3-4 in. long; tube subcylindrical,  $\frac{3}{4}$ -1 in. long, segments oblanceolate, acute, upper  $\frac{1}{2}$  in. lower  $\frac{1}{4}$ - $\frac{1}{3}$  in. broad. Stamens shorter than the segments, one ascending; anthers lilac,  $\frac{1}{6}$  in. long. Style as long as the segments; stigma capitate.

Hab. South Brazil, introduced, I believe, by Mr. Wilson Saunders about 1868. Described from a plant flowered by Mr. William Bull in Sept., 1883.

2. *G. ORNATA*, Moore in Gard. Chron. 1876, i. 266, figs. 47-48; Hook. fil in Bot. Mag. t. 6367.—Bulb ovoid, 3-4 in. diam.; neck

2-4 in. long. Leaves 6-8; blade oblong, deep green, above a foot long, 4-5 in. broad, narrowed to a short channelled petiole with a broad clasping base. Peduncle lateral, a foot long, subcompressed, as thick as the finger. Umbel 10-12-flowered, centripetal; spathe-valves thin, green, ovate-lanceolate; pedicels 1-1½ in. long. Perianth 2½-3 in. long, pale lilac; tube very short; segments oblanceolate, ⅓ in. broad. Stamens shorter than the segments, one standing up from the others; filaments white; anthers oblong, pale lilac, ⅓ in. long. Style nearly as long as the segments; stigma capitate.

Hab. South Brazil, introduced by Mr. Wm. Bull in 1876. Flowers in January and February. Described from a plant that flowered at Kew in February, 1878.

3. *G. HYACINTHINA* Herb. App. 21 Bury Hexand. t. 14. *Amaryllis hyacinthina* Gawl. in Bot. Reg. t. 163.—Bulb globose, 2-3 in. diam.; neck short. Leaves 4-5, developed after the flowers; blade oblong, acute, 6-9 in. long, 2-3 in. broad, rounded at the base to a channelled petiole as long as the blade. Peduncle 1-2 ft. long, slightly compressed. Umbel 8-10-flowered, centripetal; pedicels none or very short; spathe-valves thin, lanceolate. Perianth-limb 2 in. long, bright lilac; tube very short; segments oblanceolate, acute, upper ¼-⅓ in. broad, lower ⅓ in. Stamens much shorter than the segments. Style declinate; stigma capitate.

Hab. Brazil, introduced in 1815. Described from a living plant sent by Mr. Wm. Bull, November, 1880. A variety (*micrantha*) received from Messrs. Sander & Co. in the winter of 1880 had flowers scarcely above an inch long.

4. *G. INTERMEDIA* Lindl. in Bot. Reg. t. 990.—Bulb ovoid, longer than in *G. hyacinthina*. Leaves oblong, acute, cuneately narrowed into a long petiole. Peduncle slender, a foot long; Umbel 6-10-flowered; spathe-valves lanceolate, 1½ in. long; pedicels 1-1½ long, Perianth pale lilac, 1½-2 in. long; tube short, funnel-shaped; segments oblanceolate, ¼ in. broad above the middle. Stamens shorter than the perianth; 5 declinate, one ascending; anthers linear-oblong, ⅓ in. long. Style as long as the perianth; stigma capitate.

Hab. Brazil. Described from a plant flowered by Mr. H. J. Elwes.

5. *G. PARVIFLORA* Gawl. in Bot. Reg. t. 511.—Bulb ovoid 2-3 in. diam. Leaves 3-4 to a bulb, contemporary with the flowers, oblong, acute, half a foot long, 2½-3 in. broad at the middle, cuneately narrowed to a petiole as long as the blade. Peduncle slender, terete, nearly a foot long. Umbel 10-15-flowered; spathe-valves lanceolate, an inch long; pedicels slender, ½-1 in. Perianth pale lilac, ¾-1 in. long; tube short: segments lanceolate-unguiculate, 1-12th to 1-8th in. broad, upper broadest. Stamens 6, shorter than the segments; anthers oblong. Style shorter than the perianth; stigma capitate.

Hab. Province of Bahia, Brazil, *Moricand* 2305! Described from a plant that flowered at Kew, February, 1877. Introduced in 1815.

6. *G. BLUMENAVIA* K. Koch et Bouché; Carrière in Rev. Hort. 1867, 32; Hook fil. in Bot. Mag. t. 5666.—Bulb ovoid, 2 in. diam.

Leaves oblong, acute, 4-5 in. long, 2-2½ in. broad, cuneately narrowed to a petiole shorter than the blade. Peduncle slender, terete, 6-8 in. long. Umbel 6-8-flowered; outer spathe-valves lanceolate, 1-1½ in. long; pedicels ½-1 in. Perianth-limb pale lilac, 1½-2 in. long; segments oblanceolate, ¼-½ in. broad, the lower only half as broad as the upper. Stamens 6, unequal, as long as the perianth; anthers yellow, ⅓ in. long. Style exserted; stigma distinctly tricuspidate.

Hab. South Brazil; Province of Santa Catherina. Introduced by Dr. Blumenau about 1876. Described from a plant sent from the 'Gardeners' Chronicle,' and another from Mr. Wm. Bulk. Flowers February to April.

7. *G. LIBONIANA* Morren in Ann. Soc. Roy. Agric. Gand 1845, t. 13; Lemaire in Jard. Fleur. t. 290.—Bulb small, 1 in. diam. Leaves 5-6, contemporary with the flowers, sessile, oblong, acute, 3-4 in. long. Peduncle two-edged, a foot long. Umbel 6-8-flowered; spathe-valves lanceolate; pedicels ½-¾ in. long. Perianth pale lilac, 1-1½ in. long; tube scarcely any; segments oblanceolate. Stamens shorter than the segments; upper one suppressed. Style shorter than the segments; stigma capitate.

Hab. Central Brazil; Province of Minas Geraes. Discovered by M. Libon in 1843. Differs from the other species by its sessile leaves and suppressed upper stamen.

## 25. CLIVIA Lindl.

*Perianth* funnel-shaped, erect or rather curved; tube short; segments ascending, subequal, oblanceolate or oblanceolate-oblong, obtuse. *Stamens* inserted at the throat of the perianth-tube; filaments filiform, about as long as the segments; anthers oblong, versatile. *Ovary* globose; ovules 5-6 in a cell, fasciated at the centre of the placenta; style long, slender, tricuspidate at the apex. *Fruit* a bright red pulpy berry. *Seeds* one or few, large, globose, bulbiform. *Bulb* imperfect, consisting only of the leaf-bases; root-fibres very stout. *Leaves* numerous, distichous, persistent. *Peduncle* stout, solid compressed. *Flowers* bright red-yellow, scentless, many in an umbel, lanceolate.

Subgenus CLIVIA PROPEB.—Flower rather curved, narrowly funnel-shaped, resembling that of *Cyrtanthus* , . Sp. 1-2.

Subgenus IMANTOPHYLLUM.—Flower erect, more broadly funnel-shaped, resembling that of *Vallota* . . Sp. 3.

1. *C. NOBILIS* Lindl. in Bot. Reg. t. 1182. *Imantophyllum Aitoni* Hook. in Bot. Mag. t. 2856.—Leaves about a dozen in a tuft, lorate, very obtuse, bright green, 1-1½ ft. long, 1¼-1½ in. broad; edge scabrous. Peduncle about a foot long. Flowers 40-60 in an umbel; pedicels ½-1 in; spathe-valves several, unequal, greenish. Perianth curved; tube narrowly funnel-shaped, ¼-½ in. long; segments oblanceolate, tipped with green, about an inch long. Stamens as long as the segments. Style exserted.

Hab. Cape Colony; South-western provinces. Introduced into cultivation by Bowie in 1828.

2. *C. GARDNERI* Hook. in Bot. Mag. t. 4895.—Leaves 10–12 in a tuft, ensiform, bright green,  $1\frac{1}{2}$ –2 ft. long,  $1-1\frac{1}{2}$  in. broad, narrowed gradually to the point. Peduncle  $1-1\frac{1}{2}$  ft. long. Flowers 12–20 in an umbel; pedicels  $1-1\frac{1}{2}$  in.; spathe-valves several, lanceolate, greenish,  $1\frac{1}{2}$  in. long. Perianth curved; tube narrowly funnel-shaped,  $\frac{1}{3}-\frac{1}{2}$  in. long; segments connivent, oblanceolate, obtuse,  $1\frac{1}{4}$  in. long. Stamens as long as the segments. Style much exerted.

Hab. Natal and the Transvaal. Introduced into cultivation by Captain Garden in 1855.

### Subgenus IMANTOPHYLLUM.

3. *C. MINIATA* Regel Gartenflora 1864, 131, t. 434. *Imantophyllum miniatum* Hook. in Bot. Mag. t. 4783; Rev. Hort. 1859, 125, t. 29–30; Flore des Serres, t. 949–950, 2373–2374. Leaves 16–20 to a tuft, ensiform, bright green, narrowed to the point,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$ –2 in. broad. Peduncle stout, ancipitous,  $1-1\frac{1}{2}$  ft. long. Flowers 12–20 in an umbel; pedicels 1–2 in.; spathe-valves several, lanceolate or linear. Perianth erect, bright scarlet, with a yellow throat; tube broadly funnel-shaped,  $\frac{1}{3}-\frac{1}{2}$  in. long; segments about 2 in. long, inner segments broader than the outer. Stamens shorter than the perianth-segments. Style reaching to the tip of the segments. Berry ovoid, bright red, an inch long.

Hab. Natal. Introduced into cultivation by Messrs. Backhouse of York, in 1854. There are many named garden varieties, two of the finest being *grandiflora* and *Lindeni* (Ill. Hort. n.s. t. 343). *Imantophyllum cyrtanthiflorum*, figured Flore des Serres, t. 1877, is a garden hybrid between *miniata* and *nobilis*.

### 26. HÆMANTHUS Linn.

*Perianth* erect; tube subcylindrical; segments equal, linear or lanceolate, spreading or permanently ascending. *Stamens* inserted at the throat of the perianth-tube; filaments filiform, often longer than the segments; anthers small, oblong, versatile. *Ovary* globose, 3-celled; ovules sessile or in collateral pairs from the centre of the placenta; style filiform; stigma minutely tricuspidate. *Fruit* globose, baccate. *Seeds* often solitary; testa pale, membranous. — *Rootstock* a tunicated bulb. *Leaves* broad, obtuse, thin or fleshy. *Peduncle* stout, solid. *Flowers* red or white, densely umbellate; spathe-valves more than 2, erect or spreading, membranous.

Subgenus *NERISSA* (Salisb.). Leaves membranous. Spathe-valves and perianth-segments spreading.

Peduncle lateral. Leaves on a produced special stem; petiole short . . . . . Sp. 1–6.

Peduncle central. Leaves springing direct from the bulb, with a long petiole . . . . . Sp. 7–9.

Subgenus *GYAXIS* (Salisb.). Leaves membranous. Spathe-valves and perianth-segments permanently ascending Sp. 10–13.

Subgenus *MELICHO* (Salisb.). Bulb with thick bifarious tunics.  
Leaves thick and fleshy. Spathe-valves and perianth-segments  
spreading . . . . . Sp. 14-17.

Subgenus *DIACLES* (Salisb.). Bulb with thick bifarious tunics.  
Leaves thick and fleshy. Spathe-valves and perianth-segments  
permanently ascending.

Bracts white, veined with green. Flowers white.

Peduncle produced . . . . . Sp. 18-21.

Peduncle scarcely any . . . . . Sp. 22-23.

Bracts reddish,  $\frac{3}{4}$ -1 in. long, generally shorter  
than the flowers . . . . . Sp. 24-31.

Bracts reddish,  $1\frac{1}{2}$ -2 in. long, equalling or over-  
topping the flowers . . . . . Sp. 32-38.

### Subgenus *NERISSA*.

1. *H. MULTIFLORUS* Martyn, Monogr. cum icone; Bot. Mag. t. 961 & 1995; Andr. Bot. Rep. t. 318; Red. Lil. t. 204; Lodd. Bot. Cab. t. 912 & 1948; Flore des Serres, t. 52. *H. abyssinicus* Herb. *H. arabicus* Roem. *H. delagoensis* Herb. *H. tenuiflorus* Herb. in Bot. Mag. t. 3870. *H. Kalbreyeri* Baker in Gard. Chron. 1878, ii. 202; Flore des Serres, t. 2377; Ill. Hort. n. s. t. 354.—Bulb globose,  $1\frac{1}{2}$ -3 in. diam. Leaves 3-4, produced on a short special stem, with an oblong blade  $\frac{1}{2}$ -1 ft. long, and short sheathing petioles; main veins 6-8 on each side of the distinct midrib; transverse veinlets very close, very oblique. Peduncle separate from the leafy stem, slender or stout, plain green or spotted with red. Umbel dense, 3-6 in. diam.; pedicels 1- $1\frac{1}{2}$  in. long; spathe-valves 6-8, reflexing, green,  $1\frac{1}{2}$ -2 in. long. Perianth blood-red; tube cylindrical,  $\frac{1}{4}$ - $\frac{1}{2}$  in. long; segments linear, 3-nerved, twice as long as the tube. Filaments bright red, 1- $1\frac{1}{4}$  in. long. Berry bright scarlet.

Hab. Throughout Tropical Africa from Sierra Leone to Kordofan, Abyssinia, and Delagoa Bay. First published by Vallet in his 'Jardin du Roi' in 1608. Very variable, but I cannot make out that more than a single species is covered by the above synonyms. There is an authentic specimen of his *H. coccineus*, from Forskahl, in the Smithian Herbarium.

2. *H. FILIFLORUS* Hiern MSS.; Baker in Journ. Bot, 1878, 94.—Bulb globose. Leafy stem a foot long, bearing about 6 oblong leaves on short sheathing petioles; blade membranous, a foot long; main veins 10-12 between midrib and edge; transverse veinlets close, oblique. Peduncle lateral, a foot long, spotted. Umbel very dense, 5-6 in. diam.; pedicels 1- $1\frac{1}{4}$  in. long; spathe-valves oblong, 2 in. long, red-brown. Perianth bright red; tube cylindrical,  $\frac{1}{3}$  in. long; segments linear, 1-nerved,  $\frac{1}{2}$ - $\frac{5}{8}$  in. long. Filaments  $\frac{3}{4}$  in. long.

Hab. Angola, in the Province of Pungo Andongo, *Welwitsch* 4009! 4010! Flowers in October. Very near *H. multiflorus*; perhaps a mere variety.

3. *H. MANNII* Baker in Bot. Mag. t. 6364.—Bulb small, globose. Leaves 5-6 at the summit of a short special stem, with an oblong acute membranous blade  $\frac{1}{2}$  ft. or more long narrowed to a short channelled petiole; main veins about 10 on each side of the

midrib; transverse veinlets close, oblique. Peduncle 8–12 in. long. Umbel 3–4 in. diam., less dense than in *H. multiflorus*; pedicels  $\frac{1}{2}$  in. long; spathe-valves lanceolate, reddish. Perianth bright red; tube cylindrical,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; segments lanceolate, laxly 3-nerved,  $\frac{1}{4}$  in. long. Filaments  $\frac{3}{4}$ –1 in. long. Style overtopping the anthers.

Hab. West Africa, on the banks of the Bagroo River, gathered by Mann in 1861. Introduced by Mr. Bull from Liberia in 1877.

4. *H. RUPESTRIS* Baker in Gard. Chron. 1877, 655. — Bulb globose, 1 in. diam. Leaves 2, from the summit of a short slender special stem with slender erect petioles 2 in. long and an oblong membranous blade half a foot long, 4 in. broad, rounded at the base; main veins indistinct,  $\frac{1}{4}$ – $\frac{1}{3}$  in. apart; transverse veinlets very oblique, not so close as in *H. multiflorus*. Peduncle slender, 3–9 in. long, contemporary with the young leaves. Umbel dense, 3 in. diam.; spathe-valves 4–5, narrow oblong, reflexing, red-brown; pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Perianth bright crimson; tube cylindrical,  $\frac{1}{4}$  in. long; segments linear,  $\frac{1}{2}$  in. long. Filaments bright red,  $\frac{1}{2}$  in. long.

Hab. Guinea, in rocky places near Nupe. Gathered by Barter in the Niger Expedition of 1859.

5. *H. KATHERINÆ* Baker in Gard. Chron. 1877, 655; Hook. fil. in Bot. Mag. t. 6778. — Bulb globose, 2–3 in. diam. Leafy stem  $\frac{1}{2}$  ft. long. Leaves 4–5, contemporary with the flowers, oblong, membranous, 9–12 in. long, narrowed at the base into a short spotted sheathing petiole; main veins 8–10 on each side of the distinct midrib; transverse veinlets oblique, closer and more distinct than in *multiflorus*. Peduncle stout, distinct from the leafy stem, spotted low down, a foot long. Umbel dense, 4–9 in. diam.; pedicels 1–2 in. long; spathe 5–6, lanceolate, reflexing,  $1\frac{1}{2}$ –2 in. long. Perianth bright red; tube  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; segments lanceolate, reflexing,  $\frac{3}{4}$ –1 in. long. Filaments ascending, bright red, 1–1 $\frac{1}{2}$  in. long. Style erect, 2 in. long. Berry bright red,  $\frac{1}{2}$  in. diam.

Hab. Natal. Introduced into cultivation by Mr. Keit in 1877, and named, at his request, after Mrs. Katherine Saunders. Proves to be the finest and most easily cultivated of all the species of this subgenus.

6. *H. GRANDIFOLIUS* Balf. fil. Diag. Plant. Nov. Socot. iii. 23. — Leaves membranous, ovate, plain green, reaching a length of 12–15 in. and a breadth of 8–9 in.; main veins  $\frac{1}{4}$ – $\frac{1}{2}$  in. apart, with 2–6 finer parallel veins between them; areolæ square; petiole 1–1 $\frac{1}{2}$  in. long. Inflorescence and flower not seen.

Hab. Mountains of Socotra, gathered by Dr. I. B. Balfour in the spring of 1880.

7. *H. CINNABARINUS* Decaisne in Flore des Serres, t. 1195; Hook. in Bot. Mag. t. 5314; Floral Mag. n. s. t. 245. — Bulb globose, 1 in. diam., bearing copious fleshy cylindrical root-fibres. Leaves about 4, produced direct from the rootstock, contemporary with the flowers, with an oblong acute membranous blade 6–9 in. long, narrowed gradually into a channelled petiole of about the same length; main veins fine; transverse veinlets close and very

obtuse. Peduncle slender, a foot long, springing from the centre of the leaves. Umbel 3-4 in. diam., much less dense than in *H. multijlorus*; spathe-valves lanceolate, membranous, reflexing; pedicels  $\frac{1}{2}$ -1 in. long. Perianth bright crimson; tube  $\frac{1}{4}$ - $\frac{1}{3}$  in. long; segments lanceolate, reflexing.  $\frac{3}{4}$ - $\frac{7}{8}$  in. long, laxly 5-nerved. Filaments bright red, a little longer than the segments. Berry globose, often 2-3-seeded.

Hab. Gold Coast and Cameroon Mountains, introduced into cultivation from the Gaboon in 1857, and again by Mann in 1862. Gathered lately by Sir Richard Burton, Capt. Cameron, and Capt. Moloney.

8. *H. ANGOLENSIS* Baker in Journ. Bot. 1878, 194. — Bulb elongated. Leaves 3-4, produced direct from the bulb, with an oblong blade  $\frac{1}{2}$ -1 ft. long, rounded at the base to a channelled petiole 6-9 in. long; main veins indistinct,  $\frac{1}{4}$ - $\frac{1}{3}$  in. apart; transverse veinlets horizontal or slightly oblique. Peduncle stout, a foot long. Umbel dense, 4-5 in. diam.; pedicels 1-1 $\frac{1}{4}$  in. long; spathe-valves deciduous. Perianth bright crimson; tube  $\frac{1}{3}$  in. long; segments linear, 3-5-nerved,  $\frac{3}{4}$  in. long. Filaments above an inch long.

Hab. Angola, in the Province of Golungo Alto, alt. 1000-2400 ft., flowering in February, *Welwitsch* 4008!

9. *H. ROTULARIS* Baker in Gard. Chron. 1877, 656. — Bulb globose, 1 in. diam. Leaves springing direct from the rootstock, contemporary with the flowers; blade very thin, oblong, acute, 8-9 in. long, narrowed gradually to a channelled petiole, about half as long; main veins very fine,  $\frac{1}{4}$ - $\frac{1}{3}$  in. apart; cross veinlets nearly horizontal, not very close. Peduncle very slender,  $\frac{1}{2}$  ft. long. Umbel dense, 3 in. diam.; spathe-valves about 8, lanceolate, membranous, 1 $\frac{1}{2}$ -2 in. long; pedicels  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Perianth bright red, an inch long; tube half as long as the lanceolate segments. Filaments about as long as the segments.

Hab. Guinea; Forests of Yomba. Gathered by Barter in 1859.

### Subgenus GYAXIS.

10. *H. PUNICEUS* Linn. Sp. Pl. 413; Red. Lil. t. 320; Bot. Mag. t. 1315. *H. Redouteanus* Roem. — Bulb globose, 2-3 in. diam. Leafy stem short. Leaves 2-4, oblong, membranous, bright green. 6-9 in. long, narrowed into a short petiole, fully developed with the flowers; main veins about 6 on each side of the distinct midrib; transverse veinlets close, distinct, very oblique. Peduncle lateral, a foot or more long. Umbel dense, 3-4 in. diam.; pedicels  $\frac{1}{2}$ -1 in. long; spathe-valves ovate or oblong, imbricated, 1 $\frac{1}{2}$  in. long. Perianth pale scarlet, rarely white, an inch long; segments linear, 3-nerved, twice as long as the tube. Filaments bright red, an inch long. Style overtopping the anthers. Berry bright red, the size of a small cherry.

Hab. Southern provinces of Cape Colony, introduced into cultivation before the end of the 17th century, but now almost entirely replaced by *natalensis* and the varieties of the more showy *magnificus*.

11. *H. MEMBRANACEUS* Baker. — Closely allied to *H. puniceus*. Leaty stem not at all produced. Leaves 3-4 to a bulb, oblong, 4-6 in. long, very thin in texture; petiole slender, 3-6 in. long; main veins 4-5 on each side of the distinct midrib; cross veinlets not at all oblique and not nearly so close as in *H. puniceus*. Peduncle slender. Umbel  $1\frac{1}{2}$  in. diam.; spathe-valves oblong, reaching to the tip of the flowers; pedicels  $\frac{1}{4}$  in. long. Perianth pale red; segments twice as long as the tube. Stamens and style  $\frac{1}{4}$  in. longer than the segments.

Hab. Natal, Gerrard 735! *Peddie!* Wood 1219!

12. *H. MAGNIFICUS* Herb. in Bot. Reg. 1841, Misc. No. 153. *H. puniceus* var. *magnifica* Herb. in Bot. Mag. sub t. 3870. *H. Rouperi* Floral Mag. 1875, t. 148. — Bulb globose, 3-4 in. diam.; scale-leaves 6-8, suborbicular, green. Leaty stem reaching a length of 1-2 ft., not developed till after the peduncle, spotted with red-brown; produced leaves 6-8, oblong, membranous, bright green, undulated, a foot or more long, narrowed to a short sheathing petiole; main veins 8-10 on each side of the distinct midrib; cross-veinlets very close and very oblique. Peduncle lateral, very stout, above a foot long. Umbel globose, very dense, sometimes 5-6 in. diam.; bracts 6-8, bright green, ovate or oblong, ascending, imbricated,  $1\frac{1}{2}$ -2 in. long; pedicels  $\frac{1}{2}$ -1 in. long. Perianth bright pale scarlet, an inch long; segments linear, twice as long as the tube. Filaments bright scarlet, an inch long. Berry bright red, the size of a small cherry.

Var. *H. INSIGNIS* Hook. in Bot. Mag. t. 4745. — Spathe-valves 5-6 in. long, much overtopping the flowers.

Var. *GUMBLETONI* Baker. — Leaty stem about a foot long. Leaves orbicular, unspotted, 5-6 in. long and broad; main veins 12-15 on each side of the midrib. Peduncle very stout, 6-8 in. long. Umbel very dense; spathe-valves red-brown.

Var. *H. SUPERBUS* Hort. — Leaty stem not produced. Leaves 5-6, narrower than in the type, produced directly from the bulb, contemporary with the flowers in spring. Peduncle, bracts, and flowers of the type.

Hab. Natal and Delagoa Bay. Introduced into cultivation in 1841, and now widely spread. For living specimens of var. *Gumbletoni* I am indebted to Mr. Gumbleton, and of var. *superbus* to Sir C. W. Strickland and Messrs. Krelage, of Haarlem. Var. *insignis* was sent alive from Natal to the Rev. Mr. Roope, of Brighton.

13. *H. NATALENSIS* Pappé; Hook. in Bot. Mag. t. 5378. — Bulb globose, oblique, 2-3 in. diam.; scale-leaves about 4, round-ovate, pale green, tipped and much spotted with red-brown. Leaty stem a foot long; leaves 8-9, oblong, membranous, bright green, above a foot long, narrowed to a short sheathing petiole, the lower tipped and spotted on the back with red-brown. Peduncle produced from the axis of one of the scale-leaves, compressed, sulcate, about a foot long,  $\frac{3}{4}$ -1 in. thick. Umbel very dense, globose, 3-4 in. diam.; pedicels 1- $1\frac{1}{2}$  in. long; spathe-valves about 6, oblong, very obtuse, reddish-brown, imbricated, permanently ascending,  $1\frac{1}{2}$ -2 in. long. Perianth greenish, an inch long; segments linear, more than twice

as long as the cylindrical tube. Filaments yellowish, above an inch long. Style overtopping the anthers. Berry subglobose, red,  $\frac{1}{3}$  in. diam., usually 1-seeded.

Hab. Natal, introduced into cultivation by Dr. Sanderson in 1862. Described from living plants in the Kew collection.

#### Subgenus MELICHO.

14. *H. PUMILIO* Jacq. Hort. Schoen. i. 32, t. 61. — Bulb subglobose, 1 in. diam. Leaves 2, developed after the flowers, suberect, lorate, subacute, glabrous, 4–5 in. long,  $\frac{1}{2}$  in. broad, green, barred and spotted on the back near the base with red-brown. Peduncle slender, spotted, 2–3 in. long. Flowers 5–6 in an umbel; pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Perianth whitish,  $\frac{1}{2}$  in. long; tube short; segments spreading. Stamens and style protruded beyond the tip of the segments.

Hab. Southern provinces of Cape Colony. Known to me only from Jacquin's figure.

15. *H. LANCEÆFOLIUS* Jacq. Hort. Schoen. i. 31, t. 60. — Bulb ovoid, compressed, 1–1 $\frac{1}{2}$  in. diam.; tunics thick, bifarious. Leaves 2, rarely 3, not developed till after the flowers, lanceolate, acute, fleshy, spreading, 6–8 in. long, 2 in. broad, pale green, dotted and bared with red, glabrous on both surfaces, ciliated on the margin with minute deflexed hairs. Peduncle green, slender, compressed, 4–5 in. long. Flowers 6–8 in an umbel; pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; spathe-valves lanceolate, about  $\frac{1}{2}$  in. long. Perianth white, with a slight pinkish tinge, under  $\frac{1}{2}$  in. long; tube short; segments linear, spreading. Stamens and style reaching beyond the tip of the segments.

Hab. Southern provinces of Cape Colony. Known to me only from Jacquin's figure.

16. *H. CARNEUS* Gawl. in Bot. Reg. t. 509; Hook. in Bot. Mag. t. 3373. *H. brevifolius* Herb. Amaryll. 234, t. 30, fig. 3. — Bulb compressed, 2–3 in. diam.; tunics thick, green, bifarious. Leaves 2, developed after the flowers, pale green, oblong or obovate, obtuse, narrowed to the base, 4–6 in. long, 2–5 in. broad, softly hairy, especially towards the margin. Peduncle slender,  $\frac{1}{2}$ –1 ft. long, usually pilose and mottled with purple. Flowers in a dense globose umbel 2–3 in. diam.; pedicels slender,  $\frac{1}{2}$ –1 in. long; spathe-valves 5–6, oblong-lanceolate, reflexing, tinged with red. Perianth pink, rarely white,  $\frac{1}{2}$  in. long; tube 1–12th to 1–8th in. long; segments lanceolate, 1-nerved. Stamens sometimes equalling, sometimes longer than the perianth-segments.

Var. *H. strigosus* Herb. — Leaves naked on the surface when mature.

Hab. Eastern provinces of Cape Colony, ascending to 4000 ft. on the mountains of Kaffraria. It was gathered and sketched by Masson in 1794. Described from a plant flowered by Sir Charles Strickland in August, 1869, and one at Kew in July, 1872. A Natal plant flowered by Herr Leichtlin at Baden Baden in August, 1873, with a stouter peduncle, larger oblong, non-reflexing spathe-valves, and a perianth-limb  $\frac{3}{4}$  in. long, will probably prove a distinct species.

17. *H. AMARYLLOIDES* Jacq. Hort. Schoen. iv. t. 408. — Bulb ovoid, not compressed,  $1\frac{1}{2}$ –2 in. diam.; tunics thick, bifarious. Leaves 2, developed after the flowers, lingulate, obtuse, bright green, fleshy, glabrous,  $\frac{1}{2}$ –1 ft. long,  $1\frac{1}{2}$ –2 in. broad. Peduncle slender, glabrous,  $\frac{1}{2}$ –1 ft. long. Flowers 50 or more in a dense globose umbel 2–3 in. diam.; pedicels  $\frac{1}{2}$ –1 in. long; spathe-valves 5–6, oblong or oblong-lanceolate, spreading. Perianth pinkish or white,  $\frac{3}{8}$ – $\frac{1}{2}$  in. long; tube short; segments lanceolate, spreading. Stamens and style overtopping the perianth-segments.

Hab. Eastern provinces of Cape Colony. A plant from Bamboes Spruit, *Nelson* 244! with longer pedicels, larger pure white flowers, and shorter subacute leaves, will probably prove a distinct species.

#### Subgenus DIACLES.

18. *H. ALBIFLOS* Jacq. Hort. Schoen. i. 31, t. 59; Red. Lil. t. 398; Lodd. Bot. Cab. t. 602; Gawl. in Bot. Mag. t. 1239. *Diacles ciliaris* Salisb. *H. intermedius* Roem. — Bulb compressed, 2–3 in. diam.; tunics thick, green, bifarious. Leaves 2–4, contemporary with the flowers, lingulate, suberect, obtuse, 6–8 in. long,  $2\frac{1}{2}$ – $3\frac{1}{2}$  in. broad above the middle, narrowed gradually to the base, glabrous on the surface when mature, ciliated on the margin. Peduncle pale green, glabrous, 6–9 in. long. Umbel dense, globose, 2 in. diam.; pedicels  $\frac{1}{4}$  in. long; spathe-valves 5–6, oblong, obtuse, permanently ascending, white, veined with green. Perianth pure white,  $\frac{3}{4}$  in. long; tube subcylindrical; segments linear, twice as long as the tube. Filaments white, a little longer than the segments; anthers yellow. Berry globose, bright red,  $\frac{1}{2}$  in. diam.

Var. *PUBESCENS* Herb. *H. pubescens* Gawl. in Bot. Reg. t. 382; Lodd. Bot. Cab. t. 702, non Linn. fil. *Diacles pubescens* Salisb. — Leaves hairy on the face as well as on the margin.

Var. *BRACHYPHYLLUS* Baker. — Leaves oblong, 3–4 in. long, 2 in. broad, finely ciliated on the edge, glabrous on the surface. Peduncle glabrous, a little shorter than the leaves.

Var. *BURCHELLII* Baker. — Leaves oblong, 3–4 in. long, 2– $2\frac{1}{2}$  in. broad, hairy on the surface, densely ciliated on the margin. Peduncle hairy, a little longer than the leaves.

Hab. Southern provinces of Cape Colony, ascending to 2500 ft. in Graaf Reinet. I have seen specimens of the type dried from Kew Gardens in 1800, and of var. *pubescens* from Kew in 1795, and from Masson's garden in 1794.

19. *H. ARNOTTI* Baker in Gard. Chron. 1878, i. 498. — Bulb subglobose, 3 in. diam.; tunics thick, green, bifarious. Leaves 2, produced after the flowers, round-oblong, very obtuse, spreading, 4–5 in. long, 3–4 in. broad, green on the face, hairy towards the margin, ciliated with long soft whitish hairs. Peduncle purplish red, slightly compressed, 4–5 in. long. Umbel dense,  $1\frac{1}{2}$ –2 in. diam.; pedicels  $\frac{1}{2}$ –1 in. long; spathe-valves 5–6, oblong-lanceolate, white, with conspicuous veins of green,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long. Perianth white,  $\frac{5}{8}$  in. long; segments twice as long as the tube. Stamens and style distinctly exerted.

Hab. Cape Colony; Province of Colesberg. Described from a plant sent by Mr. Arnott, that flowered at Kew in June, 1878, and September, 1879.

20. *H. ALBOMACULATUS* Baker in Gard. Chron. 1878, i. 202.—Bulb 2 in. diam.; tunics thick, green, bifarious. Leaves 2, contemporary with the flowers, lorate, suberect, green spotted with white, above a foot long, 2–3 in. broad above the middle, glabrous on the surface, obscurely ciliated on the margin in an early stage. Peduncle stout, green, glabrous, 4–6 in. long. Umbel dense, globose,  $1\frac{1}{2}$ –2 in. diam.; pedicels  $\frac{1}{8}$ – $\frac{1}{4}$  in. long; spathe-valves 6–7, oblong, imbricated, ascending, white, with green veins,  $1\frac{1}{2}$  in. long. Perianth white, above an inch long; segments linear, twice as long as the cylindrical tube. Filaments white, an inch long; anthers oblong, yellow.

Hab. Natal. Flowered by Messrs. Low at Clapton, November, 1875, Messrs. E. G. Henderson & Son, Maida Vale, December, 1877, and Mr. F. W. Moore at Glasnevin in 1886. Gathered wild three times lately by Mr. J. M. Wood, of the Durban Botanic Garden.

21. *H. BAURII* Baker in Bot. Mag. t. 6875.—Bulb oblong, compressed, 3–4 in. diam.; tunics thick, green, bifarious. Leaves 2, suborbicular, truncate at the apex, thick, green, fleshy,  $\frac{1}{2}$  ft. long, 7–8 in. broad, glabrous on the surface, densely ciliated on the margin. Peduncle stout, green, glabrous, under 2 in. long. Umbel dense, 2 in. diam.; pedicels  $\frac{1}{8}$ – $\frac{1}{4}$  in. long; spathe-valves 5–6, oblong, membranous, white veined with green, overtopping the flowers. Perianth pure white, above an inch long; segments linear, twice as long as the tube. Filaments not longer than the perianth-segments; style finally exerted.

Hab. Mountains of Transkeian Kaffraria, discovered by the Rev. R. Baur in 1874. Described from a plant that flowered at Kew, November, 1885. Included amongst the drawings of Natal Plants showed by Miss Large at the Indian and Colonial Exhibition of 1886.

22. *H. MACKENII* Baker. — Bulb compressed, 3–4 in. diam.; tunics thick, green, bifarious. Leaves 2, contemporary with the flowers, round-oblong, spreading, 6–8 in. long, 4–5 in. broad, glabrous on the face, clothed on the edge and under surface with soft whitish hairs. Peduncle scarcely any. Umbel few-flowered, compressed; pedicels very short; bracts oblong; outer greenish, pubescent; inner white, veined with green. Perianth white, nearly an inch long; tube cylindrical,  $\frac{1}{4}$  in. long; segments linear. Filaments white, longer than the perianth-segments.

Hab. Natal, *McKen!* Described from a plant flowered by Mr. Wm. Bull, November, 1870.

23. *H. DEFORMIS* Hook. fil. in Bot. Mag. t. 5903.—Bulb slightly compressed, 3–4 in. diam.; tunics thick, green, bifarious. Leaves contemporary with the flowers, spreading, orbicular,  $3\frac{1}{2}$ –4 in. long and broad, evenly pilose over the surface, not specially ciliated. Peduncle scarcely any. Umbel compressed,  $1\frac{1}{2}$  in. the long diameter; pedicels  $\frac{1}{4}$  in. long; spathe-valves 5–6, obovate-oblong,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long, white, veined with green. Perianth white, nearly an inch long; segments twice as long as the tube. Filaments white, longer than the segments.

Hab. Natal, *McKen!* Described from a plant that flowered at Kew in March, 1871.

24. *H. ROTUNDIFOLIUS* Gawl. in Bot. Mag. t. 1618. *H. orbicularis* Donn. — Bulb compressed, 3-4 in. diam.; tunics thick, bifarious. Leaves 2, spreading, suborbicular, 5-6 in. long and broad, glabrous, scabrous on the margin. Peduncle bright red,  $\frac{1}{2}$  ft. long. Umbel dense, compressed,  $1\frac{1}{2}$ -2 in. diam.; bracts 4-5, ovate, bright red, an inch long; pedicels very short. Perianth pale red, an inch long; segments linear, twice as long as the cylindrical tube. Filaments white, longer than the segments.

Hab. Cape Colony; Southern provinces. Described from a specimen gathered by Thunberg and a plant that flowered at Kew, May, 1887. *H. Lambertianus* R. & S. is said to differ by its numerous spathe-valves.

25. *H. INCARNATUS* Burch.; Herb. Amaryll. 237, tab. 31, fig. 1. — Bulb compressed, 2-3 in. diam.; tunics thick, bifarious. Leaves 2, oblong, spreading, 6-8 in. long,  $3\frac{1}{2}$ -4 in. broad, glabrous and not ciliated, but scabrous on the margin. Peduncle reddish, glabrous, 3-4 in. long. Umbel dense, globose, 2 in. diam.; pedicels short; spathe-valves 4-5, oblong, ascending, pale red, about an inch long. Perianth pale red,  $\frac{3}{4}$  in. long; tube short; segments linear. Stamens slightly exerted.

Hab. Cape Colony; South-eastern district, at Krakamma. Cultivated by Burchell at Fulham in 1817-1819. Nearly allied to *H. rotundifolius*.

26. *H. COOPERI* Baker. — Bulb compressed, 4 in. diam. Leaves 2, produced in October, spreading, suborbicular, 4-5 in. long, shortly ciliated on the margin. Peduncle much compressed, glabrous, bright red, as long as the leaves. Umbel dense, globose, 2-3 in. diam., produced in July; spathe-valves ovate, bright red, an inch long; pedicels  $\frac{1}{4}$  in. long. Perianth bright red, under an inch long; segments twice as long as the tube. Filaments distinctly exerted; anthers pale yellow.

Hab. Cape Colony. Described from a specimen from Mr. Thos. Cooper, that flowered at Kew in July, 1863.

27. *H. HIRSUTUS* Baker in Gard. Chron. 1878, 756. — Bulb compressed, 3 in. diam.; tunics thick, brownish, bifarious. Leaves 2, contemporary with the flowers, round-oblong, 5-6 in. long, 3-4 in. broad, dark green, hairy all over, especially at and near the edge. Peduncle a little longer than the leaves, densely pilose. Umbel dense, globose, 3-4 in. diam.; pedicels  $\frac{1}{2}$  in. long; spathe-valves 6, oblong, membranous, bright red, shorter than the flowers. Perianth white or pinkish,  $\frac{3}{4}$ -1 in. long; segments linear, twice as long as the tube. Filaments and style much exerted.

Hab. Natal, *Cooper* 3231! *Wood* 3443! *Transvaal*, *C. Mudd*! Described from a plant flowered by Messrs. Veitch in April, 1878.

28. *H. UNDULATUS* Herb. Amaryll. 233, tab. 30, fig. 1. — Bulb ovoid, under an inch in diam. Leaves 2, suberect, lorate, glabrous, much undulated, 5-6 in. long,  $\frac{1}{2}$  in. broad above the middle, narrowed gradually to  $\frac{1}{8}$  in. at the base. Peduncle slender, spotted, glabrous, 2-3 in. long. Umbel dense, about 1 in. diam.; pedicels  $\frac{1}{4}$ - $\frac{1}{3}$  in. long; spathe-valves 4, oblong, ascending, bright red, an inch long. Perianth  $\frac{1}{2}$  in. long; tube very short. Stamens much exerted, reaching to the tip of the spathe-valves.

Hab. Cape Colony; Rhinoceros Fontein, near Langvalei. Collected by Masson in July, 1793.

29. *H. CONCOLOR* Burch. ; Herb. Amaryll. 238, tab. 31, fig. 2.— Bulb oblong, compressed; tunics thick, bifarious. Leaves 2, suberect, lorate, about a foot long,  $1\frac{1}{2}$ –2 in. broad at the middle, glabrous, not ciliated. Peduncle slender, rather shorter than the leaves. Umbel dense, globose,  $1\frac{1}{2}$  in. diam.; pedicels  $\frac{1}{4}$  in. long; spathe-valves 5–6, oblong, membranous, bright red, an inch long. Perianth bright red,  $\frac{3}{4}$  in. long; tube very short; segments linear. Stamens exserted,  $\frac{1}{4}$ – $\frac{1}{3}$  in.

Hab. Cape Colony; South-western district. Flowered in Burchell's garden, October, 1826. Perhaps not distinct from *H. sanguineus*.

30. *H. SANGUINEUS* Jacq. Hort. Schoen. iv. 4, t. 407. *Melicho sanguineus* Salisb. — Bulb compressed, about 3 in. diam.; tunics thick, bifarious. Leaves 2, suberect, lorate, about a foot long, 2–3 in. broad above the middle, green, glabrous. Peduncle produced before the leaves, slender, glabrous, 8–9 in. long. Umbel dense, globose, 2 in. diam.; pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; spathe-valves 6–8, oblong or lanceolate, reddish, 1– $1\frac{1}{2}$  in. long. Perianth  $\frac{3}{4}$  in. long; segments linear, blood-red, twice as long as the cylindrical tube. Filaments exserted.

Hab. Cape Colony; Southern provinces. The obscure *H. Hookerianus* Herb. Amaryll. 404, tab. 46, fig. 7, may be the same species, but the leaves are not known.

31. *H. HUMILIS* Jacq. Hort. Schoen. iv. 6, t. 411. *Melicho humilis* Salisb. — Bulb ovoid, slightly compressed, 1 in. diam. Leaves 2, suberect, lorate, produced after the flowers, light green, subacute,  $\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad above the middle, glabrous on the face, minutely ciliated. Peduncle much compressed, 2 in. long. Umbel compressed; pedicels nearly as long as the flowers; spathe-valves about 6, lanceolate, an inch long. Perianth whitish,  $\frac{1}{3}$  in. long; tube very short; segments linear. Filaments exserted. Berry white.

Hab. Cape Colony; Southern provinces. Known to me only from Jacquin's figure.

32. *H. CALLOSUS* Burchell. — Bulb compressed, 3–4 in. diam.; tunics thick, bifarious. Leaves 2, spreading, orbicular-oblong, glabrous, 9–10 in. long, 6–7 in. broad, not ciliated. Peduncle stout, about 3 in. long. Umbel dense,  $1\frac{1}{2}$ –2 in. diam.; pedicels very short; spathe-valves about 6, oblong, membranous, bright red, ascending, 2 in. long, much overtopping the flowers. Perianth pink,  $\frac{3}{4}$  in. long; tube very short; segments linear. Stamens exserted.

Hab. Cape Colony; Southern district. Cultivated by Burchell at Fulham in 1818–1819.

33. *H. COCCINEUS* Linn. Sp. Pl. 412; Gawl. in Bot. Mag. t. 1075; Red. Lil. t. 139; Lodd. Bot. Cab. t. 240. — Bulb compressed, 3–4 in. diam.; tunics thick, bifarious. Leaves 2, fully developed in winter, lingulate, suberect,  $1\frac{1}{2}$ –2 ft. long, 6–8 in. broad above the middle, narrowed to 3–4 in. at the base, green, unspotted,

glabrous. Peduncle 6-9 in. long, compressed, mottled with minute spots of red-brown. Umbel dense, globose, 2-3 in. diam.; pedicels  $\frac{1}{4}$ - $\frac{1}{2}$  in. long; spathe-valves 6-8, oblong, bright red, ascending, imbricated, 2-2 $\frac{1}{2}$  in. long. Perianth bright red, about an inch long; tube short; segments linear. Stamens exerted.

Var. *H. COARCTATUS* Jacq. Hort. Schoen. i. 30, t. 57; Bot. Reg. t. 181.—Fully developed leaves a foot long, 3-4 in. broad. Spathe-valves shorter.

Var. *H. CARINATUS* Linn. Sp. Pl. 413.—Leaves above a foot long, much narrower and more channelled down the face than in the type.

Hab. Cape Colony; Southern provinces. Introduced into cultivation by Philip Miller in 1731.

34. *H. MOSCHATUS* Jacq. Hort. Schoen. iv. 6, t. 410. — Bulb compressed, 3 in. diam.; tunics thick, bifarious. Leaves 2, produced after the flowers, lingulate, 1 $\frac{1}{2}$  ft. long, 4-4 $\frac{1}{2}$  in. broad at the middle, obscurely pubescent when young, naked when mature, marked on the back with transverse bars of dark green on a pale green ground. Peduncle glabrous, much compressed, pale green,  $\frac{1}{2}$  ft. long. Umbel dense, globose, 2-3 in. diam.; pedicels  $\frac{1}{4}$ - $\frac{1}{2}$  in. long; spathe-valves oblong, subacute, ascending, bright red, 2 in. long. Flowers with a strong foxy or musky smell. Perianth bright red, nearly an inch long; segments three times as long as the tube. Stamens distinctly exerted.

Hab. Cape Colony; Southern provinces. Very near *H. coccineus*.

35. *H. TIGRINUS* Jacq. Hort. Schoen. i. 29, t. 56; Bot. Mag. t. 1705. — Bulb subglobose, compressed, 3-4 in. diam.; tunics thick, bifarious. Leaves 2, produced after the flowers, falcate, lingulate, 9-12 in. long, 3-4 in. broad at the middle, glabrous on the surfaces, obscurely ciliated, much spotted with red-brown on the lower part of the back. Peduncle 2-4 ft. long, green, much spotted with red-brown. Umbel dense, globose, 1 $\frac{1}{2}$ -2 in. diam.; pedicels short; spathe-valves 6-8, oblong, obtuse, very bright red, permanently ascending, 1 $\frac{1}{2}$ -2 in. long. Perianth pale red, under an inch long; tube very short. Stamens distinctly exerted.

Hab. Cape Colony; Southern provinces. Gathered and sketched by Masson in 1795. Described from a plant flowered at Kew, November, 1887.

36. *H. HYALOCARPUS* Jacq. Hort. Schoen. iv. 5, t. 409. — Bulb ovoid, compressed, 2 in. diam.; tunics thick, bifarious. Leaves 2, produced after the flowers, lorate, suberect, about a foot long, 2 in. broad, glabrous, not spotted. Peduncle 4-6 in. long, green, mottled with dark red. Umbel dense, globose, 2 in. diam.; pedicels  $\frac{1}{4}$  in. long; spathe-valves about 6, oblong, bright red, overtopping the flowers. Perianth red, an inch long; tube short; segments linear. Stamens slightly exerted. Berry white, containing a single seed.

Hab. Cape Colony; Southern provinces. *H. zebrinus* Herb., of which the flowers are not known, differs from this by its narrower leaves, densely spotted on the back, and slightly on the face.

37. *H. CRASSIPES* Jacq. Hort. Schoen. iv. 7, t. 412.—Bulb ovoid, 1 $\frac{1}{2}$  in. diam.; tunics thick, bifarious. Leaves 2, produced after the

flowers, lorate, suberect,  $\frac{1}{2}$  ft. long,  $1\frac{1}{2}$ –2 in. broad, glabrous on the face, softly ciliated, mottled with red on the back towards the base. Peduncle 3 in. long, compressed, green, mottled with red. Umbel dense, globose; pedicels short; spathe-valves 5–6, oblong or oblong-lanceolate, reddish, ascending,  $1\frac{1}{2}$  in. long. Perianth pale red,  $\frac{3}{4}$ – $\frac{7}{8}$  in. long; tube short; segments linear. Stamens exerted.

Hab. Cape Colony; Southern provinces. Known to me only from Jacquin's figure.

38. *H. PUBESCENS* Linn. fil. Suppl. 193. *H. quadrivalvis* Jacq. Hort. Schoen. i. 30, t. 58; Bot. Mag. t. 1523. — Bulb compressed, 2 in. diam.; tunics thick, bifarious. Leaves 2, produced after the flowers, lorate, suberect, 6–9 in. long,  $1\frac{1}{2}$ –2 in. broad above the middle, narrowed to  $\frac{1}{4}$ – $\frac{1}{3}$  in. at the base, minutely ciliated, glabrous or finely pilose on the back and face, blotched with red on the back towards the base. Peduncle compressed, dark red, 3–4 in. long. Umbel dense, globose, 1– $1\frac{1}{2}$  in. diam.; pedicels very short; spathe-valves usually 4, oblong, red, ascending,  $1\frac{1}{2}$ –2 in. long, overtopping the flowers. Perianth bright red,  $\frac{3}{4}$ – $\frac{7}{8}$  in. long; tube short; segments linear. Stamens distinctly exerted.

Hab. Cape Colony; Southern provinces. I have seen specimens collected by Thunberg and Masson, and from the garden of Dr. Gwyn in 1783. This and not *albiflos* is the *pubescens* of the Linnean and Thunbergian herbaria.

## 27. BUPHANE Herb.

*Perianth* erect, hypocrateriform; tube short, subcylindrical or campanulate; segments equal, linear or lanceolate. *Stamens* inserted at the throat of the perianth-tube; filaments straight, filiform; anthers oblong, versatile. *Ovary* turbinate, 3-celled; ovules 2 in a cell, collateral, sessile at the middle of the placenta; style simple; stigma obscurely 3-lobed. *Capsule* turbinate, membranous, loculicidally 3-valved. *Seeds* solitary, green, globose.—*Rootstock* a very large tunicated bulb. *Leaves* coriaceous, ensiform or lingulate. *Peduncle* short, stout, solid. *Flowers* in an umbel very numerous, red; spathe of two large ovate valves.

1. *B. DISTICHA* Herb. in Bot. Mag. sub t. 2578. *Amaryllis disticha* Linn. fil. *B. toxicaria* Herb. *Hamanthus toxicarius* Thunb.; Jacq. Fragm. t. 39–40; Gawl. in Bot. Mag. t. 1217. *Brunsvigia toxicaria* Gawl. in Bot. Reg. t. 567. — Bulb subglobose, 6–9 in. diam., with many hundreds of thin brown tunics. Leaves 8–16, distichous, ensiform, suberect, not ciliated, finally 1– $1\frac{1}{2}$  ft. long, often undulated. Peduncle stout, compressed, glaucous,  $\frac{1}{2}$ –1 ft. long. Umbel dense,  $\frac{1}{2}$ –1 ft. diam.; pedicels 2–4 in. long; spathe-valves ovate, deciduous, 2–3 in. long. Perianth tube subcylindrical,  $\frac{1}{4}$ – $\frac{1}{2}$  in. long; segments linear,  $\frac{3}{4}$ –1 in. long. Stamens equalling or a little exceeding the perianth-segments. Capsule turbinate,  $\frac{3}{4}$  in. long.

Hab. Eastern provinces of Cape Colony northward to Angola, Lake Nyassa, and Lake Tanyanika, where it was found by Lieut. Cameron and Mr. Joseph Thomson. Fruited by Sir C. W. Strickland in August, 1879.

2. *B. ciliaris* Herb. in Bot. Mag. sub t. 2573. *Amaryllis ciliaris* Linn. *Hæmanthus ciliaris* Linn.; Jacq. Fragm. t. 40, fig. 1, & t. 41, fig. 1. *Brunsvigia ciliaris* Gawl.; Lindl. in Bot. Reg. t. 1153. *Coburgia ciliaris* Herb. *Crossyne ciliaris* Salisb. — Bulb globose, 3–4 in. diam. Leaves 4–6, spreading, lingulate, rigidly coriaceous,  $\frac{1}{2}$ –1 ft. long, densely ciliated with brown or straw-coloured bristles  $\frac{1}{8}$ – $\frac{1}{3}$  in. long. Peduncle stout, 4–6 in. long. Flowers 50–100 in a dense umbel; pedicels rigid, triquetrous, 3–4 in. long; spathe-valves much shorter than the pedicels. Perianth-tube small, campanulate; segments lanceolate, dull purple, reflexing,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Capsule  $\frac{1}{4}$ – $\frac{1}{3}$  in. diam.

Var. *B. GUTTATA* Herb. Amaryll. 240, tab. 22, fig. 1. — Leaves narrower; bristles subulate,  $\frac{1}{4}$ – $\frac{1}{2}$  in. long.

Hab. Southern provinces of Cape Colony. Sketched by Masson in 1795 (var. *guttata*), and introduced into cultivation by Burchell.

## 28. CRINUM Linn.\*

*Perianth* hypocateriform or funnel-shaped; tube long, cylindrical, straight or curved; segments linear, lanceolate or oblong, subequal. *Stamens* inserted at the throat of the perianth-tube; filaments long, filiform; anthers linear, versatile. *Ovary* 3-celled; ovules few in a cell, sometimes two only, sessile or immersed in the thick placenta; style long, filiform, more or less declinate; stigma minute, capitate. *Fruit* irregular in shape, finally bursting. *Seeds* large, green, bulbiform, with very thick albumen. — *Rootstock* a large bulb, with membranous tunics and a produced neck. *Leaves* persistent, usually broad. *Peduncle* solid. *Flowers* few or many in an umbel, white or reddish; pedicels short; spathe-valves 2, broad.

Subgenus *STENASTER*. *Perianth* erect, hypocateriform; segments linear. *Stamens* spreading.

Species of Tropical Asia . . . .	Sp. 1–8.
„ Australia and Polynesia . . . .	Sp. 9–11.
„ Tropical Africa . . . .	Sp. 12–24.
„ Tropical America . . . .	Sp. 25–26.

Subgenus *PLATYASTER*. *Perianth* erect, hypocateriform; segments lanceolate. *Stamens* spreading.

Species of Tropical Asia . . . .	Sp. 27–34.
„ Australia . . . .	Sp. 35–38.
„ Tropical Africa . . . .	Sp. 39–44.
„ Tropical America . . . .	Sp. 45–52.

Subgenus *CODONOCRINUM*. *Perianth* funnel-shaped; tube permanently curved; segments oblong, ascending. *Stamens* and style contiguous, declinate.

Species of Tropical Asia . . . .	Sp. 53–55.
„ Australia . . . .	Sp. 56.
„ Tropical Africa . . . .	Sp. 57–68.
„ The Cape . . . .	Sp. 69–76.
„ Tropical America . . . .	Sp. 77–79.

\* Reprinted, with additions and alterations, from 'Gardeners' Chronicle,' 1881, i. 763.

## Subgenus STENASTER.

1. *C. ASIATICUM* Linn. Sp. Pl. 419, ex parte; Gawl. in Bot. Mag. t. 1073. *C. toxicarium* Roxb. *C. asiaticum* var. *toxicarium* Herb.; Wight, Ic. t. 2021-2022. — Bulb 4-5 in. diam.; neck 6-9 in. long. Leaves 20-30, lorate, multifarious, thin, bright green, 3-4 ft. long, 3-4 in. broad, narrowed gradually to an acute point. Peduncle ancipitous,  $1\frac{1}{2}$ -2 ft. long, an inch thick. Flowers 20-50 in an umbel; spathe-valves 3-4 in. long; pedicels  $\frac{1}{2}$ -1 in. long. Perianth white; tube erect, tinged with green, 3-4 in. long; segments linear,  $2\frac{1}{2}$ -3 in. long. Stamens tinged with red, 2 in. long; anthers  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Ovules solitary. Fruit subglobose,  $1\frac{1}{2}$ -2 in. diam., generally 1-seeded.

Var. *C. DECLINATUM* Herb. in Bot. Mag. t. 2231; Bury, Hexand. t. 43. — Peduncle assurgent and plicate. Bud slightly cernuous; tube and limb longer than in the type, the latter tinged with red.—Sillet.

Var. *C. SINICUM* Roxb. — Leaves 5 in. broad, with a very undulated edge. Peduncle 3 ft. long. Tube and segments longer than in the type.—China.

Var. *C. PROCERUM* Carey; Herb. in Bot. Mag. t. 2684.—Leaves 5 ft. long, half a foot broad. Perianth-tube and limb each 5 in. long, the latter tinged red on the outside.—Rangoon.

Var. *C. ANOMALUM* Herb. *C. plicatum* Livingstone; Hook. in Bot. Mag. t. 2908. — Leaves expanded suddenly at some distance above the base into a broad membranous plicate variegated wing.—China.

Var. *JAPONICUM* Baker.—Leaves firmer in texture, 2-2 $\frac{1}{2}$  in. broad. Pedicels longer. Perianth-tube 2-2 $\frac{1}{2}$  in. long, and limb a little shorter.—Shores of Japan.

Hab. Widely spread in Tropical Asia. Figured by Rumphius in 1750. There is a specimen at the British Museum sent from Tranquebar by the Moravian brethren in 1784. The synonyms cited under *asiaticum* by Linnæus include *erubescens*, *longifolium*, and *deflexum*. It appears to extend eastward to the Aru Islands.

2. *C. SUMATRANUM* Roxb. Hort. Beng. 23; Lindl. in Bot. Reg. t. 1049. *C. rigidum* Herb. — Bulb ovoid, as large as in *asiaticum*, but the neck shorter. Leaves ensiform, suberect, 3-4 in. broad, narrowed gradually to the point, firm in texture, dark dull green; edge distinctly serrulate. Peduncle much shorter than the leaves. Umbel 10-20 flowered; spathe-valves lanceolate-deltoid, 3 in. long; pedicels very short. Perianth-tube erect, greenish, 3-4 in. long; segments linear, as long as the tube, not tinged with red outside. Filaments bright red, much shorter than the segments; anthers linear,  $\frac{3}{4}$  in. long. Fruit as large as a man's fist, 1-3-seeded.

Hab. Sumatra, introduced by Dr. Charles Campbell to the Calcutta Botanic Garden in 1801. *C. macrocarpum* Carey, from Rangoon, is probably a near ally, but it is known only from a brief diagnosis.

3. *C. AMABILE* Donn, Hort. Cantab. ed. vi. 83; Ker in Bot. Mag. t. 1605. *C. superbum* Roxb.—Bulb small, but with a neck a foot or more long. Leaves 25-30, lorate, 3-4 ft. long, 3-4 in. broad, bright green, tapering gradually to the point, the outer spreading,

the inner suberect; margin narrow, entire. Peduncle 2-3 ft. long, ancipitous. Flowers 20-30 in an umbel, very fragrant; spathe-valves lanceolate-deltoid, tinged red, 4-5 in. long; pedicels  $\frac{1}{2}$ -1 in. long. Perianth-tube erect, cylindrical, bright red, 3-4 in. long; segments 4-5 in. long,  $\frac{1}{3}$ - $\frac{1}{2}$  in. broad, red on the outside. Ovules few in a cell. Stamens an inch shorter than the segments.

Hab. Sumatra, introduced into cultivation at the beginning of the century by Dr. Campbell and Sir Stamford Raffles. Described from a plant that flowered at Kew in the winter of 1871. An allied plant with much smaller flowers, collected by Kurz in the Andaman Isles, requires further study.

4. *C. DEFINUM* Ker in Journ. Sc. iii. 105; Lodd. Bot. Cab. t. 362; Herb. in Bot. Mag. t. 2208. *C. asiaticum* Linn. ex parte; Roxb.; *C. Rowburghii* Dalz. & Gibs. *Amaryllis vivipara* Lam.—Bulb ovoid, 2-3 in. diam.; neck long, cylindrical. Leaves 6-8 to a bulb, linear, 2-3 ft. long,  $\frac{3}{4}$ -1 in. broad, deeply channelled down the face, tapering to the point; margin entire. Peduncle moderately stout, 1 $\frac{1}{2}$ -2 ft. long. Umbel 6-15-flowered; spathe-valves ovate-lanceolate, 1 $\frac{1}{2}$ -2 in. long; pedicels short. Perianth-tube slender, erect, 2 $\frac{1}{2}$ -3 in. long; segments linear, nearly as long as the tube. Filaments bright red, an inch shorter than the segments; anthers linear,  $\frac{1}{2}$  in. long. Capsule subglobose, 2 in. diam.; seeds 1-2 in a cell.

Var. *C. ENSIFOLIUM* Roxb.; Herb. in Bot. Mag. t. 2301.—Leaves more acute. Perianth-tube 4 in. long; segments as long as the tube, tinged red on the outside.—Pegu.

Hab. Muddy and swampy banks of rivers about Calcutta and through Peninsular India. Flowers in October. Figured by Rheede in 1692.

5. *C. WATTI* Baker.—Bulb ovoid, 2 in. diam.; neck very short. Leaves ensiform, thin, flaccid, tapering gradually to the point, 1 $\frac{1}{2}$  ft. long, 1-1 $\frac{1}{4}$  in. broad; margin entire. Peduncle moderately stout, 1 $\frac{1}{2}$  ft. long. Umbel 6-8-flowered; spathe-valves lanceolate-deltoid, 1 $\frac{1}{2}$  in. long; pedicels very short. Buds tinged with purple. Perianth-tube slender, erect, 3 in. long; segments linear, half as long as the tube. Stamens as long as the segments; anthers linear,  $\frac{1}{3}$  in. long.

Hab. Manipur; Myang Khong Valley, alt. 4000 ft., in grassy places, *Dr. G. Watt* 7148! Allied to *C. defixum*.

6. *C. STENOPHYLLUM* Baker in Gard. Chron. 1881, 786.—Leaves thin, flaccid, linear, 3 ft. long,  $\frac{1}{4}$ - $\frac{1}{3}$  in. broad. Peduncle slender, ancipitous, about a foot long. Umbel 4-flowered; spathe-valves lanceolate-acuminate, 2 in. long; pedicels  $\frac{1}{4}$  in. Perianth-tube slender, erect, 3-4 in. long; segments linear, spreading, half as long as the tube. Stamens shorter than the segments.

Hab. Tavoy, collected by Gomez in October, 1827, *Wallich Herb. Ind.* 8970! Nearest *C. defixum*.

7. *C. SERRULATUM* Baker in Gard. Chron. 1881, 786. — Bulb ovoid, 2 in. diam.; tunics thick, dull brown; neck short. Leaves 10-12, suberect, linear, firm in texture, under a foot long,  $\frac{1}{4}$ - $\frac{1}{3}$  in. broad, tapering gradually to the point, distinctly serrulate on the margin. Peduncle slender, about a foot long. Umbel few-flowered; spathe-valves lanceolate, an inch long; pedicels very short. Perianth-

tube slender, erect,  $3\frac{1}{2}$ –4 in. long; segments linear,  $3\frac{1}{2}$ –4 in. long, tinged with red on the outside. Stamens nearly as long as the segments; anthers small, linear.

Hab. Cambodia; Mountains of Pursat, *Godefroy-Lebeuf* 397!

8. *C. PUSILLUM* Herb. Amaryll. 255, tab. 32, fig. 3.— Bulb very narrow, with a cylindrical neck 4 in. long, under  $\frac{1}{2}$  in. diam. Leaves few, linear, acute, suberect, under a foot long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad; margin entire. Flowers few in an umbel; pedicels above an inch long. Perianth-tube erect, 3 in. long; segments linear, nearly as long as the tube. Stamens an inch shorter than the segments; anthers  $\frac{1}{3}$  in. long.

Hab. Nicobar Islands. Allied to *C. deflexum*.

9. *C. PEDUNCULATUM* R. Br. Prodr. 297; Ker in Bot. Reg. t. 52; Bury, Hexand. t. 11. *C. taitense* Red. Lil. t. 408. *C. canaliculatum* Roxb. *C. australe* and *exaltatum* Herb. — Bulb 4 in. diam.; neck columnar,  $\frac{1}{2}$  ft. long. Leaves 20 to a bulb, lorate, thin, bright green, 3–4 ft. long, 4–5 in. broad; margin entire. Peduncle ancipitous, 2–3 ft. long, 1 in. diam. Flowers 20–30 to an umbel; spathe-valves 3–4 in. long; pedicels 1– $1\frac{1}{2}$  in. Perianth greenish, erect,  $2\frac{1}{2}$ –3 in. long; segments linear, spreading, shorter than the tube, not tinged with red outside. Filaments bright red,  $1\frac{1}{2}$ –2 in. long; anthers linear,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Style rather longer than the stamens. Ovules 3 in a cell.

Hab. Eastern Australia. Described from a plant that flowered in the Palm-house at Kew in the summer of 1878. Herbert names and describes four varieties. We have what is probably the same species from Timor Laut, *Riedel*!; Fiji, *Seemann* 640!; New Caledonia, *Caldwell*!; and New Guinea, *Edeijfeldt* 219!, the latter received from Baron von Mueller; and Redouté's plant is supposed to have come from Tahiti. Mr. Wm. Bull has lately introduced a fine form from Lord Howe's Island.

10. *C. MACRANTHERUM* Engl. Jahrb. v. 448. — Bulb with a stout produced neck. Leaves lorate, 3 ft. long, 4 in. broad at the middle, narrowed gradually to the point. Spathe-valves 5–6 in. long; pedicels under an inch. Perianth white, with a cylindrical tube above 3 in. long, and linear spreading segments 4 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad. Filaments nearly as long as the segments; anthers linear, above an inch long.

Hab. New Mecklenburg and New Hanover, *Naumann*. Discovered on the voyage of the 'Gazelle,' 1875.

11. *C. BAKERI* Schumann in Engl. Jahrb. iv. 194. — Leaves linear, 1– $1\frac{1}{2}$  ft. long,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. broad, rather undulated on the smooth margin. Perianth-tube rather curved,  $1\frac{1}{2}$ –2 in. long; segments linear, reddish,  $2\frac{1}{2}$ –3 in. long,  $\frac{1}{4}$  in. broad. Filaments rather shorter than the segments; anthers linear, an inch long.

Hab. Marshall's Island, *Finsch*.

12. *C. BRACTEATUM* Willd. Sp. Pl. ii. 47; Jacq. Hort. Schoen. iv. t. 495; Gawl. in Bot. Reg. t. 179. *C. brevifolium* Roxb. *C. asiaticum* var. *bracteatum* Herb. — Bulb ovoid, 3–4 in. diam.; neck short. Leaves 6–8 to a bulb, lorate, thin, subobtuse, 1– $1\frac{1}{2}$  in. long, 3–4 in. broad at the middle, narrowed to the base; margin crisped,

entire. Peduncle a foot long, much compressed, moderately stout. Flowers 10–20 in an umbel; spathe-valves broad, green, 3 in. long; pedicels very short. Perianth-tube slender, erect, greenish,  $2\frac{1}{2}$ –3 in. long; segments linear, spreading, pure white. Filaments bright red,  $1\frac{1}{2}$ –2 in. long; anthers linear,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Ovules solitary.

Hab. Wild in the Seychelles, especially on the sandy beaches of the western coast of the Island of Mahé, *Horne*! Introduced from Mauritius long ago to the Calcutta Botanic Garden.

13. *C. WELWITSCHII* Baker in Gard. Chron. 1881, ii. 40.—Leaves linear,  $1\frac{1}{2}$ –2 ft. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad, moderately firm in texture; edge slightly scabrous. Perianth-tube curved, 4 in. long; segments linear, ascending, nearly as long as the tube. Stamens short.

Hab. Angola, *Welwitsch* 4016! This seems very distinct, but the only specimen I have seen is incomplete.

14. *C. MAURITIANUM* Lodd. Bot. Cab. t. 650.—Leaves ensiform, suberect, about 3 ft. long, apparently not more than 2– $2\frac{1}{2}$  in. broad. Peduncle much shorter than the leaves. Flowers 4 in an umbel, sessile. Perianth-tube suberect, 3–4 in. long; segments linear, rather shorter than the tube, tipped with red. Stamens and style shorter than the segments.

Hab. Cultivated by Loddiges at Hackney in 1822, and known now only from the much-reduced figure in their 'Botanical Cabinet.' Nothing like has been sent home from Mauritius of late years.

15. *C. LIGULATUM* Baker in Journ. Linn. Soc. xx. 270.—Leaves about 8 in a tuft, lorate, reaching a length of 2–3 ft., 2 in. broad at the middle, moderately firm in texture; margin entire. Peduncle stout, a foot or more long. Flowers 20–30 in a dense umbel, sessile; spathe-valves broad, 2–3 in. long. Perianth-tube slender, erect, 3–4 in. long; segments linear, 2– $2\frac{1}{2}$  in. long. Stamens rather shorter than the perianth-segments; anthers linear,  $\frac{1}{2}$  in. long. Style as long as the perianth-segments.

Hab. Central Madagascar, *Baron* 1982! 3575! 4389! *Dr. Parker*! *Hildebrandt* 3716! Native name, *Kingatsy*. Allied to *C. asiaticum*.

16. *C. FIRMIFOLIUM* Baker in Journ. Linn. Soc. xx. 270.—Leaves narrow, lorate, firm in texture, 3 ft. long,  $1\frac{1}{2}$  in. broad at the middle, tapering gradually to the point; margin distinct, entire. Peduncle a foot long. Umbel 6–8-flowered; spathe-valves  $1\frac{1}{2}$ –2 in. long; pedicels none: perianth-tube straight, 5–6 in. long; segments linear, 2– $2\frac{1}{2}$  in. long. Stamens about as long as the segments; anthers linear,  $\frac{1}{2}$  in. long. Style overtopping the anthers.

Hab. East coast of Madagascar, *Baron* 1638! 4431! Gathered by the Rev. R. Baron, who has discovered about a thousand new plants in Madagascar, in 1882.

17. *C. LEUCOPHYLLUM* Baker in Bot. Mag. t. 6783.—Bulb ovoid, 5–6 in. diam. Leaves 12–15, distichous, lorate-oblong, fleshy, whitish green, reflexing, thick in texture,  $1\frac{1}{2}$ –2 ft. long, 5–6 in. broad; margin denticulate. Peduncle stout, much compressed, a foot long. Flowers 30–40 in a dense centripetal umbel; spathe-valves deltoid, 3 in. long; pedicels 1–2 in. long. Perianth-tube erect, 3 in. long; limb pale pink; segments linear, patent, 2– $2\frac{1}{4}$  in.

long. Filaments a little shorter than the segments; anthers linear-oblong,  $\frac{1}{3}$  in. long. Style as long as the segments.

Hab. Damara-land. Flowered at Kew, August, 1881, from a bulb purchased from a Danish sea-captain named Thuré Ein.

18. *C. TINNEANUM* Kotschy & Peyritsch in Plant. Tinneanæ, 44, t. 21. — Bulb and leaves unknown. Scape green, compressed. Flowers 12–30 in an umbel; spathe-valves lanceolate-deltoid, 2–3 in. long; pedicels 1–2 in. long. Perianth-tube erect, very slender,  $2\frac{1}{2}$ –3 in. long; limb rose-red; segments linear, not more than half as long as the tube,  $\frac{1}{8}$ – $\frac{1}{6}$  in. broad. Filaments half as long as the perianth-segments; anthers linear-oblong,  $\frac{1}{4}$  in. long. Ovules several, superposed.

Hab. East Tropical Africa. First gathered on the banks of the Bahr-el-Ghosal by Mdlle. Tinné. Found also by Kotschy in Kordofan, and by Father Knobler in a garden at Gondokoro. The specific name is printed *Tinneæ* in the text, and indexed by Pritzels as *cordofanum*.

19. *C. LASTH* Baker. — Bulb globose, 4–5 in. diam.; neck short. Leaves ensiform, distichous, acute, as long as the peduncle, disarticulating near the base, when the flowers fade. Peduncle above a foot long, stout and much compressed. Umbel many-flowered; spathe-valves broad, membranous; pedicels  $\frac{1}{2}$ –1 in. Perianth-tube slender, erect, 3– $3\frac{1}{2}$  in. long; limb pink,  $1\frac{1}{2}$  in. long; segments linear. Stamens as long as the segments; anthers linear-oblong,  $\frac{1}{4}$  in. long.

Hab. Kongone Mountains, 100 miles inland from Zanzibar, alt. 2000 ft. Gathered by Mr. Last. Bulb sent home by Sir John Kirk in March, 1881, but we failed to flower it.

20. *C. BAINESH* Baker in Gard. Chron. 1881, ii. 40. — Bulb and leaves unknown. Peduncle moderately stout. Flowers 20–30 in a dense umbel; spathe-valves ovate,  $1\frac{1}{2}$  in. long; pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. Perianth with a slender erect tube  $2\frac{1}{2}$ –3 in. long; limb red, half as long as the tube; segments linear. Filaments nearly as long as the segments, bright red; anthers linear-oblong,  $\frac{1}{4}$  in. long. Style reaching to the tip of the segments. Ovules several, superposed.

Hab. South-east Tropical Africa, near Koozie. Known only from a single specimen gathered by Mr. T. Baines, the artist, in 1881. Nearly allied to *C. Tinneanum*.

21. *C. THRUPPI* Baker. — Leaves short, lorate, firm in texture, closely veined, 2 in. broad; margin denticulate. Peduncle short, stout. Flowers 20–30 in a dense umbel; spathe-valves broad, membranous; pedicels  $\frac{3}{4}$ –1 in. Perianth-tube slender, erect,  $2\frac{1}{2}$ –3 in. long; limb erect, pink, 2 in. long; segments linear. Stamens nearly as long as the segments; anthers linear,  $\frac{1}{4}$  in. long. Style reaching to the tip of the segments.

Hab. Somali-land. Gathered by Messrs. Thrupp and James in April, 1885. Allied to *C. Tinneanum*.

22. *C. AMMOCHAROIDES* Baker in Journ. Bot. 1878, 195. — Bulb large, globose; neck short. Leaves 6–8 to a bulb, closely veined, lorate, curved, about a foot long, an inch broad; margin distinctly ciliated. Peduncle stout, much compressed, 3–6 in. long. Flowers 10–20 in an umbel; spathe-valves lanceolate, 2–3 in. long; pedicels

$\frac{1}{2}$ –1 in. Perianth-tube erect, 3–4 $\frac{1}{2}$  in. long; segments linear, bright red, 2–3 in. long. Filaments bright red, as long as the segments; anthers linear-oblong,  $\frac{1}{4}$  in. long. Style just overtopping the anthers. Ovules several, superposed.

Hab. East Tropical Africa; Djur-land, *Dr. Schweinfurth* 1370! 1787! Kordofan, *Dr. Pfund* 377! 765!

23. *C. BUPHANOIDES* Welwitsch MSS.; Baker in Journ. Bot. 1878, 195.—Bulb 5–6 in. diam. Leaves ensiform, firm in texture, 1 $\frac{1}{4}$ –1 $\frac{1}{2}$  ft. long, 2–2 $\frac{1}{2}$  in. broad at the middle, tapering gradually to the point; margin fringed with minute lanceolate scales. Peduncle moderately stout, a foot long. Flowers 30–40 in an umbel; spathe-valves broad, deciduous; pedicels finally 1–1 $\frac{1}{2}$  in. long. Perianth-tube erect, 3–4 in. long; segments linear, 2–2 $\frac{1}{2}$  in. long,  $\frac{1}{4}$  in. broad, keeled with red down the back. Filaments nearly as long as the segments; anthers linear,  $\frac{1}{3}$  in. long. Style as long as the segments.

Hab. Angola, in sandy woods of the subtemperate region in the Province of Pungo Andongo, *Welwitsch* 4014!

24. *C. ANGOLENSE* Benth. Gen. Plant. iii. 730. *Buphane angolensis* Baker in Journ. Bot. 1878, 197.—Bulb large, ovoid. Leaves 6–8 to a stem, lorate, much curved, spreading, distichous, 6–8 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad, glaucous, fimbriate-ciliate. Peduncle stout, not more than 1–2 in. long. Flowers 6–8 in an umbel, dull red; spathe-valves lanceolate, 1 $\frac{1}{2}$ –2 in. long; pedicels very short. Perianth-tube straight, cylindrical, 2 in. long; segments falcate, linear, 1 $\frac{1}{4}$ –1 $\frac{1}{2}$  in. long. Filaments  $\frac{1}{2}$  in. long; anthers linear-oblong,  $\frac{1}{6}$  in. long. Style short.

Hab. Angola, in damp pastures of the Province of Huilla, alt. 3800–5500 ft., flowering in October, *Welwitsch* 4012! A very distinct and curious plant.

25. *C. CARIBÆUM* Baker in Gard. Chron. 1881, ii. 40. *C. floridanum* Griseb. Flora Brit. West Ind. 583, non Fraser.—Leaves lorate-oblong, 9–10 in. long, 3–4 in. broad, narrowed gradually to  $\frac{1}{2}$  in. at the base. Flowers 3–4 in an umbel; pedicels as long as the ovary. Perianth-tube nearly straight, 3–4 in. long; segments linear, spreading, nearly as long as the tube, white,  $\frac{1}{8}$  in. broad.

Hab. Gathered in Jamaica by the Rev. Mr. Wullschagel. Known to me only from Grisebach's description. *C. floridanum* Fraser, founded on a plant brought from Florida, is *C. asiaticum*, according to Herbert.

26. *C. CRUENTUM* Gawl. in Bot. Reg. t. 171; Lodd. Bot. Cab. t. 346; Bury, Hexand. t. 22.—Bulb large, stoloniferous; neck short. Leaves lorate, glossy, dark bright green, suberect, 2–3 in. broad, 3–4 ft. long, tapering to the point, closely veined; edge entire. Peduncle stout, compressed, above 2 ft. long. Flowers 6–8 in an umbel, subsessile; spathe-valves lanceolate-deltoid, 3 in. long. Perianth-tube erect, 7–8 in. long; segments linear, bright pink, 3 in. long, spreading or reflexing. Filaments bright red, rather shorter than the segments; anthers linear,  $\frac{1}{2}$  in. long. Style as long as the segments.

Var. *C. LODDIGESIANUM* Herb. Amaryll. 401.—Pedicels as long as the ovary. Perianth-segments dark purple at the tip.

Hab. Mexico. Introduced into cultivation in Herbert's time, but I have never seen it alive.

## Subgenus PLATYASTER.

27. *C. HUMILE* Herb. in Bot. Mag. t. 2636.—Bulb small, globose, greenish; neck very short. Leaves linear, a foot long, spreading, subacute, thicker than in *amenum* and pitted over the face. Peduncle slender, subterete, a foot long. Flowers 6–9 in an umbel, cernuous in bud; spathe-valves 2–3 in. long; pedicels short. Perianth-tube greenish, 3 in. long; segments linear-lanceolate, spreading, white, 2 in. long,  $\frac{1}{3}$  in. broad. Filaments bright red, rather shorter than the perianth-segments. Style longer than the segments.

Hab. Tropical Asia. Imported alive by Captain Craigie in 1826, and sold to Mr. Cattley, after whom the genus of orchids was named. An imperfect specimen from the collection of Dr. Stocks may perhaps belong here.

28. *C. CUMINGII* Baker in Gard. Chron. 1881, ii. 72.—Leaves linear, a foot long, an inch broad, thin; edge entire. Peduncle slender, a foot long. Flowers 10–12 in an umbel; spathe-valves lanceolate, 2 in. long; pedicels very short. Perianth-tube very slender, 2–2 $\frac{1}{2}$  in. long, straight or slightly curved; segments lanceolate, nearly or quite as long as the tube. Filaments bright red, nearly as long as the segments; anthers linear,  $\frac{1}{2}$  in. long. Style as long as the segments.

Hab. Philippines; Island of Luzon, province of Albay, *Cuming* 1832!

29. *C. AMENUM* Roxb. Hort. Beng. 23.—Bulb globose, 2–3 in. diam.; neck very short. Leaves 10–12 to a bulb, linear, suberect, bright green, 1 $\frac{1}{2}$ –2 ft. long, 1–2 in. broad, tapering gradually to the point; edge scabrous. Peduncle slender, subterete, 1–2 ft. long. Flowers 6–12 in an umbel; spathe-valves lanceolate, 2 in. long; pedicels none or very short. Perianth-tube greenish, 3–4 in. long; segments lanceolate, spreading, 2–3 in. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad. Filaments bright red, rather shorter than the segments; anthers linear,  $\frac{1}{2}$  in. long. Style as long as the segments. Ovules 4–5 in a cell.

Var. *CAUDICEUM* Herb.—Bulb furnished with a cylindrical neck. Ceylon.

Var. *C. VERECUNDUM* Carey.—Leaves more obtuse, spreading, lacunose. Rangoon.

Hab. Eastern Himalayas and Khasia, ascending to 6000 ft. in Sikkin. There are good unpublished drawings in the Roxburgh and Cathcart series, both now at Kew. It was in the Calcutta Garden in Wallich's time. (Herb. Ind. 8971, B.).

30. *C. GRACILE* E. Meyer in Presl Rel. Haenk. ii. 120.—Leaves linear, 1 $\frac{1}{2}$  ft. long, 1 $\frac{1}{2}$  in. broad, narrowed from the middle to both ends. Peduncle slender, about a foot long. Flowers 6–7 in an umbel; spathe-valves lanceolate, 1 $\frac{1}{2}$  in. long; pedicels none or very short. Perianth-tube 3 in. long; segments lanceolate, less than half as long as the tube. Filaments shorter than the segments.

Hab. Philippines; Island of Luzon, gathered by Haenke.

31. *C. STRACHEYI* Baker in Gard. Chron. 1881, ii. 72.—Leaves lorate, 2 ft. long, 1 $\frac{1}{2}$ –2 in. broad, thin, acute; edge slightly denti-

culate. Peduncle stout,  $1\frac{1}{2}$ –2 ft. long. Flowers 12–15 in an umbel; spathe-valves lanceolate,  $2\frac{1}{2}$ –3 in. long; pedicels  $\frac{1}{2}$ –1 in. Perianth-tube slender, 3– $3\frac{1}{2}$  in. long, straight or slightly curved when the flower is fully expanded; segments lanceolate, spreading, 2– $2\frac{1}{2}$  in. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad. Filaments nearly as long as the perianth-segments; anthers linear,  $\frac{1}{3}$  in. long. Style a little longer than the segments.

Hab. Kumaon, in gardens, *Strachey & Winterbottom!*

32. *C. BALFOURII* Baker in Bot. Mag. t. 6570.—Bulb globose, 3 in. diam.; neck short. Leaves 10–12 to a bulb, lorate, spreading, under a foot long, the outer 2– $2\frac{1}{2}$  in. broad, firm; edge entire. Peduncle compressed, longer than the leaves. Flowers 10–12 in a centripetal umbel, very fragrant; spathe-valves lanceolate, 2 in. long; pedicels short, stout. Perianth tube greenish, 2 in. long; segments pure white, lanceolate, as long as the tube,  $\frac{1}{2}$  in. broad. Filaments rather shorter than the segments; anthers small, linear-oblong. Style red, declinate, as long as the stamens.

Hab. Island of Socotra, discovered by Professor Bayley Balfour. Described from a plant that flowered at Kew in the autumn of 1880.

33. *C. PRATENSE* Herb. Amaryll. 256. *C. longifolium* Roxb. Hort. Beng. 23, non Thunb.—Bulb ovoid, 4–5 in diam.; neck short. Leaves 6–8 to a bulb, linear, suberect,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$ –2 in. broad, narrowed to the point, channelled down the face; margin entire. Peduncle lateral, compressed, a foot or more long, about  $\frac{1}{2}$  in. diam. Flowers 6–12 in an umbel; spathe-valves lanceolate-deltoid, 2–3 in. long; pedicels none or very short. Perianth-tube greenish, 3–4 in. long, at first curved; segments lanceolate, white, nearly or quite as long as the tube,  $\frac{1}{2}$  in. broad. Filaments bright red, rather shorter than the segments. Ovules 3–4 in each cell.

Var. *C. LORIFOLIUM* Roxb. Fl. Ind. ii. 131.—Leaves weak, decumbent, 4–5 ft. long. Pegu.

Var. *C. ELEGANS* Carey; Bot. Mag. t. 2592.—Bulb with a longer neck. Peduncle decumbent. Perianth-tube an inch shorter than the segments. Pegu.

Var. *C. VENUSTUM* Carey.—Flowers about 30 in an umbel. Silhet.

Hab. Plains of India, in low ground liable to inundation. Described from a living plant flowered by Mr. W. Bull in July, 1872.

34. *C. NORTHIANUM* Baker in Gard. Chron. 1882, i. 671.—Leaves lorate, resembling those of *C. asiaticum*, 3–4 in. broad, much overtopping the flowers. Peduncle stout, an inch thick. Flowers 30–40 in a dense centripetal umbel; spathe-valves large, ovate, reflexing. Perianth-tube greenish, 3–4 in. long; segments lanceolate, white, as long as the tube,  $\frac{1}{2}$  in. broad. Filaments bright red, an inch shorter than the segments; anthers linear. Style shorter than the stamens.

Hab. Borneo; common on the edge of streams near Sarawak. Described from a drawing of Miss North's (424). No specimens have yet reached England, so far as I am aware.

35. *C. BRACHYANDRUM* Herb. Amaryll. 249.—Bulb 3 in. diam.; neck short. Leaves about 20 to a bulb, suberect, ensiform, 3–5 ft. long, 2 in. broad, deep green, not tapering much to the point. Peduncle 2 ft. long. Flowers above 10–30 to an umbel, not perfectly erect; pedicels very short. Perianth-tube greenish, under 3 in. long; segments lanceolate,  $\frac{1}{3}$  in. broad, rather longer than the tube. Filaments scarcely an inch long. Style an inch long. Seeds 2 in a cell.

Hab. North Australia, introduced to the Calcutta Garden by Dr. Carey, and sent by him to Dean Herbert about 1820. I have not seen any specimen, nor has it been figured. In its short stamens and style it agrees with *C. venosum* R. Br.

36. *C. VENOSUM* R. Br. Prodr. 297.—Bulb and leaves unknown. Peduncle moderately stout, above a foot long. Umbel 6–8-flowered; spathe-valves lanceolate, 3 in. long; pedicels very short. Perianth-tube very slender, 3–4 in. long, curved in an early stage; segments lanceolate, acute,  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{2}$  in. broad. Filaments  $\frac{1}{2}$  in. long; anthers linear,  $\frac{1}{3}$  in. long. Style a little overtopping the anthers.

Hab. North coast of Australia, *R. Brown!* Siveers Island, Gulf of Carpentaria, *Oldfield!* Differs in flower from all forms of *angustifolium* by its short stamens and style.

37. *C. UNIFLORUM* F. Muell. Fragm. iii. 23.—Bulb small, ovoid; neck short. Leaves 5–6 to a bulb, narrow linear, arcuate,  $1-1\frac{1}{2}$  ft. long,  $\frac{1}{8}-\frac{1}{4}$  in. broad. Peduncle slender, a foot long. Flowers often solitary, sometimes 2; spathe-valves linear or lanceolate; pedicels none or very short. Perianth-tube 3–4 in. long, curved in an early stage; segments lanceolate, pure white,  $2\frac{1}{2}$ –3 in. long,  $\frac{1}{2}$  in. broad at the middle. Filaments bright red,  $1\frac{1}{2}$  in. long; anthers linear,  $\frac{1}{2}$  in. long. Style overtopping the stamens. Ovules several in a cell.

Hab. North Australia, in open sandy flats, *R. Brown!* *Macgillivray* 482! *J. G. Veitch!* There are specimens in Sir J. E. Smith's herbarium from Loddiges' garden at Hackney, dried in 1879; and from Mr. Hunter, of Perryhill, near Birmingham. I have never seen it alive.

38. *C. ANGUSTIFOLIUM* R. Br. Prodr. 297. *C. australasicum* Herb. *C. arenarium* Herb. in Bot. Mag. t. 2355.—Bulb subglobose, 3 in. diam.; neck short. Leaves linear, firm in texture, suberect,  $1\frac{1}{2}$ –2 ft. long,  $1-1\frac{1}{2}$  in. broad, tapering to the point; edge scabrous. Peduncle a foot long. Umbel few-flowered; spathe-valves lanceolate, 2 in. long; pedicels short. Perianth-tube slender, 3–4 in. long, curved in early stage; segments lanceolate,  $2\frac{1}{2}$ –3 in. long,  $\frac{1}{2}$  in. broad. Filaments bright red, an inch shorter than the segments; anthers linear,  $\frac{1}{2}$  in. long. Style as long as the segments. Ovules 5–6 in a cell.

Var. *C. CONFERTUM* Herb. in Bot. Mag, t. 2522.—Flowers sessile; perianth-segments 4 in. long, a little exceeding the tube.

Var. *C. BLANDUM* Roem. Amaryll. 76 (Bot. Mag. t. 2531).—Leaves broader than in type. Perianth-segments broader. Filaments whitish.

Hab. North Australia. Differs from *C. asiaticum*, with which Mr. Bentham unites it, by the narrow leaves of firmer texture, few-flowered umbels, lanceolate perianth-segments, and numerous superposed ovules.

39. *C. MODESTUM* Baker in Journ. Linn. Soc. xxii. 528.—Bulb 2 in. diam.; neck 2 in. long. Leaves 6–8, linear, a foot long,  $\frac{1}{2}$  in. broad low down, tapering to the point, finely ribbed; edge scabrous. Peduncle slender, a foot long. Flowers 5–6 in an umbel, sessile; spathe-valves lanceolate, Perianth-tube slender, erect, 2 in. long; segments lanceolate, patent,  $1\frac{1}{2}$  in. long,  $\frac{1}{3}$  in. broad. Stamens rather shorter than the segments; anthers  $\frac{3}{8}$  in. long.

Hab. Central Madagascar, *Baron* 48! 4223!

40. *C. PURPURASCENS* Herb. Amaryll. 250; Baker in Bot. Mag. t. 6525.—Bulb ovoid, 2 in. diam., with a short neck and abundant stolons. Leaves 20 or more to a bulb, linear, thin, much undulated, 1–3 ft. long, an inch broad, sometimes floating. Peduncle slender, a foot or less long. Flowers 5–9 in an umbel; pedicels none or very short; spathe-valves lanceolate,  $1\frac{1}{2}$ –2 in. long. Perianth-tube very slender, 5–6 in. long; segments lanceolate, spreading, half as long as the tube, tinged with red on the outside. Filaments bright red, nearly as long as the segments; anthers very narrow,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Style reaching to the tip of the segments. Ovules 3–4 in a cell.

Hab. Guinea and Fernando Po, in streams and lakes. Described from a plant that flowered at Kew in June, 1877, sent by the Rev. Hugh Goldie. A variety with linear perianth-segments was gathered in 1884, by Kalbreyer.

41. *C. SUBCERNUUM* Baker in Gard. Chron. 1881, ii. 180.—Bulb large. Leaves lorate. Peduncle stout, compressed, lateral,  $1\frac{1}{2}$ – $2\frac{1}{2}$  ft. long. Flowers 10–15 in an umbel. Spathe-valves broad, reflexing, 2–3 in. long; pedicels sometimes 1– $1\frac{1}{2}$  in. long. Perianth-tube 4–5 in. long, curved before the flower expands; segments lanceolate, half as long as the tube,  $\frac{1}{3}$  in. broad. Filaments bright red, erectopatent, under 2 in. long; anthers linear,  $\frac{1}{2}$  in. long. Style overtopping the anthers.

. Hab. Common along the Zambesi from its mouth up to Lake Nyassa. Gathered and sketched by Sir John Kirk in 1861 and 1863. Allied to *C. Hildebrandtii*.

42. *C. HILDEBRANDTII* Vatke in Monat. Konig. Acad. Wiss. Berlin, 1876, 863; Baker in Bot. Mag. t. 6709.—Bulb ovoid, 2–3 in. diam.; neck 4–5 in. long. Leaves about 10 to a bulb, lorate, bright green, moderately firm in texture,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$ –2 in. broad; edge entire. Peduncle slender, compressed, a foot long. Flowers 4–8 in an umbel; spathe-valves very long, lanceolate; pedicels very short. Perianth-tube erect, 6–8 in. long; segments lanceolate, spreading, pure white, 2–3 in. long. Filaments rather shorter than the segments; anthers linear,  $\frac{1}{2}$  in. long. Style reaching the tip of the segments.

Hab. Mountains of Johanna Island, alt. 3000 ft.; discovered by the late Dr. Hildebrandt in 1875. Described from a plant sent by Sir John Kirk, that flowered at Kew in Sept., 1882. A variety with more numerous flowers is figured Ill. Hort. n.s., t. 615.

43. *C. CRASSICAULE* Baker.—Bulb and leaves unknown. Peduncle very stout, much compressed, above an inch in diameter at the tip. Umbel many-flowered; spathe-valves broad, deciduous; pedicels  $\frac{1}{4}$ – $\frac{1}{2}$  in.; ovary ampullæform,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long at the flowering time. Perianth-tube straight, erect, 3–4 in. long; segments lanceolate, as long as the tube,  $\frac{1}{2}$  in. broad at the middle. Filaments two-thirds as long as the segments; anthers stout, yellow,  $\frac{3}{4}$  in. long.

Hab. South-east Tropical Africa. Described from a single incomplete dried specimen gathered by Mr. T. Baines, the artist, in Oct., 1861. A very fine plant, nearly allied to *C. augustum*.

44. *C. AUGUSTUM* Roxb. Hort. Beng. 23; Herb. in Bot. Mag. t. 2397, Bury, Hexand. 64. *C. amabile* var. *augustum* Gawl. in Bot. Reg. t. 679.—Bulb regularly conical,  $\frac{1}{2}$  ft. diam., sometimes a foot long. Leaves 20–30 to a bulb, lorate, 2–3 ft. long, 3–4 in. broad, bright green, moderately firm in texture, narrowed to the point, closely veined; edge entire. Peduncle lateral, much compressed, 2–3 ft. long, deep claret-red upwards. Flowers 12–30 in an umbel; spathe-valves broad, tinged with red, 3–4 in. long; pedicels sometimes an inch long. Perianth-tube stout, bright red, straight or rather curved, 3–4 in. long; segments lanceolate, erecto-patent, 4–5 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad, bright red outside, filaments bright red, half as long as the segments; anthers linear, an inch long. Style reaching up to the anthers. Seeds solitary in the cells.

Hab. Marshes and streamsides in Mauritius and the Seychelles. Introduced into cultivation in 1819. Described from a plant sent by Mr. Horne, that flowered at Kew in April, 1875.

45. *C. ERUBESCENS* Ait. Hort. Kew, i. 413; Red. Lil. t. 27; Jacq. Hort. Schoen. t. 494; Lodd. Bot. Cab. t. 31; Gawl. in Bot. Mag. t. 1232.—Bulb ovoid, 3–4 in. diam., with a short neck. Leaves numerous, arcuate, lorate, thin, closely veined, 2–3 ft. long, 2–3 in. broad; edge slightly scabrous. Peduncle 2 ft. or more long. Flowers 4–12 in an umbel; pedicels none or very short; spathe-valves green, lanceolate-deltoid, 3 in. long. Perianth-tube erect, 5–6 in. long; segments lanceolate, reflexing, half as long as the tube, claret-purple outside. Filaments bright red, 2 in. long; anthers linear,  $\frac{1}{2}$  in. long. Ovules 4–5 in a cell.

Hab. Widely spread throughout Tropical America. Figured in Miller's 'Icones' (tab. 110), and there is a specimen at the British Museum dried from a garden at Spring Grove in 1784. Herbert defines and names seven varieties, amongst which are *C. corantynum* and *C. Gordonianum* Roemer.

46. *C. AMERICANUM* Linn. Sp. Plant, 419; Gawl. in Bot. Mag. t. 1034.—Bulb ovoid, 3–4 in. diam., with a short neck. Leaves 6–10 to a bulb, lorate, arcuate, 2–3 ft. long,  $1\frac{1}{2}$ –2 in. broad, moderately firm in texture, closely veined; edge entire. Peduncle moderately stout,  $1\frac{1}{2}$ –2 ft. long. Flowers 3–6 in an umbel; pedicels none or very short; spathe-valves lanceolate-deltoid, 2–3 in. long. Perianth-tube straight, 4–5 in. long; segments lanceolate, spreading or ascending, pure white, 3–4 in. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad. Filaments 2– $2\frac{1}{2}$  in. long; anthers linear. Style overtopping the anthers. Ovules 5–6 in a cell.

Hab. Southern United States. The type specimen described by Linnæus in 'Hortus Cliffortianus' is at the British Museum.

47. *C. COMMELYNI* Jacq. Hort. Schoen. t. 202. *C. Commelinianum* Herb. *C. attenuatum* Willd. *C. Lindleyanum* Herb. *C. revolutum* Lindl. *C. viridifolium* Roemer.—Bulb ovoid,  $1\frac{1}{2}$ –2 in. diam. with copious stolons and a short neck. Leaves ensiform, 2–3 ft. long, an inch broad, firm in texture, bright green, closely veined; edge slightly scabrous. Peduncle slender, compressed, 1–2 ft. long. Flowers 4–6 in an umbel; pedicels none or very short; spathe-valves lanceolate from a broad base, 2–3 in. long. Perianth-tube slender, erect, 4–6 in. long; segments lanceolate, reflexing, half as long as the tube. Filaments bright red, about 2 in. long; anthers linear,  $\frac{1}{2}$  in. long. Ovules 3–4 in a cell.

Hab. Guiana and the Amazon Valley, figured by Commelinus from the Amsterdam Garden (tab. 15) in 1706. Scarcely more than a variety of *C. erubescens*.

48. *C. STRICTUM* Herb. in Bot. Mag. t. 2635. *C. Herbertianum* Roem. et Schultes.—Bulb small, ovoid, without any distinct neck. Leaves lorate, pale green, suberect, 1 ft. long, 2–2 $\frac{1}{2}$  in. broad; edge entire. Peduncle green, subterete, twice as long as the leaves. Flowers about 4 in an umbel; pedicels none or very short; spathe-valves 2–3 in. long. Perianth-tube pale green, suberect, about 5 in. long; segments lanceolate, white, 3–4 in. long;  $\frac{1}{2}$  in. broad. Filaments red, an inch shorter than the segments; anthers linear,  $\frac{1}{2}$  in. long.

Hab. Described and figured by Dean Herbert from garden specimens of uncertain origin. It has been attributed to Ceylon, but its nearest affinity is with the American Platysters.

49. *C. UNDULATUM* Hook. Exot. Flora t. 200.—Bulb small, ovoid, with a long neck. Leaves dark green, ensiform, firm in texture, suberect,  $1\frac{1}{2}$  ft. long, an inch broad; edge entire. Peduncle green, a foot long. Flowers 4 in an umbel; pedicels none or very short; spathe-valves green, linear lanceolate, 3–4 in. long. Perianth-tube greenish, 7–8 in. long, curved before the flower expands; segments lanceolate, undulated, erecto-patent, 3 in. long, not purple outside. Filaments bright red, 2 in. long; anthers linear. Style overtopping the anthers.

Hab. North Brazil; Maranham. Sent alive by Mr. R. Hesketh, about 1827, to the Liverpool Botanic Garden.

50. *C. KUNTHIANUM* Roem. Amaryll. 80. *C. erubescens* H. B. K., non Ait.—Bulb ovoid, 3 in. diam., with a short neck. Leaves about 20 to a bulb, lorate, spreading, bright green, 2–3 in. broad, undulated towards the entire margin. Peduncle a foot long. Flowers 4–5 in an umbel; pedicels none or very short; spathe-valves lanceolate, 3 in. long. Perianth-tube 7–8 in. long; segments white, lanceolate, 2 $\frac{1}{2}$  in. long. Filaments bright red, under 2 in. long; anthers under  $\frac{1}{2}$  in. long, Style overtopping the anthers.

Var. *NICARAGUENSE* Baker. Leaves longer, narrower. Perianth-segments 3 in. long, purple on the outside.

Hab. The type gathered by Humboldt in New Granada, the variety by Mr. Ralph Tate in 1867, near Greytown, in Nicaragua.

51. *C. CONCINNUM* Mart. in Roem. et Schultes, Syst. Veg. vii. 857.—Bulb and leaves unknown. Peduncle green, under a foot long. Flowers 12 in an umbel; inner erect; outer curved; pedicels very short; spathe-valves reflexing, lanceolate,  $1\frac{1}{4}$  in. long. Perianth-tube  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long; segments lanceolate,  $2\frac{1}{2}$ –3 in. long, purple outside. Filaments half as long as the segments; anthers small, oblong. Style reaching to the tip of the segments.

Hab. Central Brazil, gathered long ago by Martius, in the sides of mountains near Villarica, in the province of Minas Geraes.

52. *C. GRACILIFLORUM* Kunth et Bouché in Ind. Sem. Hort. Berol. 1844.—Bulb 3–4 in. diam.; tunics greenish yellow; neck short. Leaves about 14 to a bulb, lorate, light green, firm in texture,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$ –2 in. broad; edge denticulate. Peduncle much shorter than the leaves. Flowers 6–8 in an umbel; pedicels none or very short; spathe-valves 3–4 in. long. Perianth-tube erect, 5–6 in. long; segments lanceolate, reflexing, half as long as the tube. Filaments bright red, 2 in. long; anthers linear. Style overtopping the anthers.

Var. *FENDLERI* Baker.—Leaves thinner, 3–4 ft. long, 3–4 in. broad.

Hab. Venezuela, near Maracaibo. Moritz 1200! Sent alive by Moritz in 1844 to the Berlin Garden. Var. *Fendleri*; Tovar, *Fendler* 2169!

#### Subgenus CODONOCRINUM.

53. *C. ZEYLANICUM* Linn. Syst. Veg. 263. *Amaryllis zeylanica* Linn. Sp. Plant. 421. *A. ornata* Bot. Mag. t. 1171. *C. Herbertianum* Wall. Pl. Asiat. Rar. t. 145. *C. Wallichianum* Roem. *C. ornatum* vars. *zeylanicum* and *Herbertianum* Herb.—Bulb globose, 5–6 in. diam.; neck short. Leaves 6–10 to a bulb, thin, lorate, bright green, 2–3 ft. long, 3–4 in. broad; edge slightly scabrous. Peduncle stout, about as long as the leaves, tinged with red. Flowers 10–20 in an umbel, fragrant; spathe-valves lanceolate-deltoid, reddish, 3–4 in. long; pedicels very short. Perianth-tube curved, usually 3–4 rarely 5–6 in. long, tinged with red or green; limb horizontal, 3–4 in. long; segments oblong-lanceolate, acute, an inch broad, bright red outside in the central third. Stamens declinate, about an inch shorter than the segments; anthers linear,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Style overtopping the stamens. Ovules 5–6 in a cell. Fruit subglobose,  $1\frac{1}{2}$ –2 in. diam.

Hab. Widely spread in Tropical Asia and Tropical Africa. The commonest species in this section in cultivation, figured first by Commelinus in 1697. Var. *reductum* Baker in Gard. Chron. 1883, ii. 618, is a variety sent from Zanzibar by Sir John Kirk, with leaves 1– $1\frac{1}{2}$  ft. long, under 2 in. broad low down, and a perianth-tube nearly twice as long as the limb. A plant from the Usagura Mountains (collected by Mr. Last), that flowered at Kew in June, 1887, does not differ materially from the Asiatic type.

54. *C. LATIFOLIUM* Linn. Sp. Plant. 419; Lindl. in Bot. Reg. t. 1297; Wight Ic. t. 2019–2020. *C. ornatum* var. *latifolium* Herb. *C. Linnæi* Roem.—Bulb subglobose, 6–8 in. diam.; neck short. Leaves numerous, thin, lorate, bright green, 2–3 ft. long, 3–4 in. broad; edge slightly scabrous. Peduncle 1–2 ft. long. Flowers

10–20 in an umbel; spathe-valves deltoid, greenish, 3 in. long; pedicels very short. Perianth-tube curved, greenish, 3–4 in. long; limb horizontal, about as long as the tube; segments oblong-lanceolate, acute, an inch broad at the middle, faintly tinged with red in the centre outside. Filaments declinate,  $2\frac{1}{2}$ –3 in. long; anthers linear,  $\frac{3}{4}$ –1 in. Style finally overtopping the anthers. Ovules 5–6 in a cell, superposed.

Hab. Widely spread in Tropical Asia. *C. longistylum* Herb.; *C. moluccanum* Roxb., Bot. Mag. t. 2292; *C. speciosum* Herb. in Bot. Mag. t. 2217; and *C. insigne* Schultes (*Amaryllis insignis* Gawl. in Bot. Reg. t. 579) seem all slight varieties of this species.

55. *C. BRACHYNEMA* Herb. in Bot. Reg. 1842, Misc. No. 28; Hook. fil. in Bot. Mag. t. 5937; Flore des Serres, t. 2303.—Bulb ovoid,  $2\frac{1}{2}$ –3 in. diam., without a distinct neck. Leaves lorate, not developed till after the flowers,  $1\frac{1}{2}$ –2 ft. long, 3–3 $\frac{1}{2}$  in. broad, bright green, moderately firm in texture; edge entire. Peduncle a foot long, subterete. Flowers 15–20 in an umbel; spathe-valves lanceolate,  $1\frac{1}{2}$ –2 in. long; pedicels at most as long as the ovary. Perianth-tube not much curved, greenish,  $1\frac{1}{2}$ –2 in. long; segments pure white, oblanceolate-oblong, obtuse, cuspidate, 2 in. long,  $\frac{3}{4}$  in. broad. Filaments only  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; anthers small, oblong. Style shorter than the stamens.

Hab. Bombay Presidency. Described from a plant that flowered at Kew in May, 1877, the bulb of which was sent by Mr. Woodrow. Easily distinguished by its short stamens and style.

56. *C. FLACCIDUM* Herb. in Bot. Mag. t. 2133. *Amaryllis australasica* Ker in Bot. Reg. t. 426.—Bulb ovoid, 3–4 in. diam.; neck very short. Leaves linear,  $1\frac{1}{2}$ –2 ft. long, 1–1 $\frac{1}{2}$  in. broad, closely veined, scabrous on the edge. Peduncle  $1\frac{1}{2}$ –2 ft. long, much compressed. Flowers 6–8 in an umbel; spathe-valves lanceolate-deltoid, 3–4 in. long; pedicels 1–1 $\frac{1}{2}$  in. Perianth-tube 3–4 in. long, usually curved; segments oblong-lanceolate, pure white both inside and out, about as long as the tube, acute,  $\frac{3}{4}$  in. broad at the middle. Stamens much shorter than the segments; anthers linear,  $\frac{1}{2}$  in. long. Ovules several in each cell, superposed.

Hab. New South Wales and South Australia, first gathered, though not named, by Robert Brown. Introduced into cultivation in 1819, but I have not seen it alive. *C. Weinmanni* Roem. Amaryll. 90, is probably the same species.

57. *C. PAUCIFLORUM* Baker in Journ. Bot. 1878, 195.—Bulb globose, 2–3 in. diam.; neck very short. Leaves about 6 to a bulb, linear, very firm in texture, stiffly erect, 1–1 $\frac{1}{2}$  ft. long,  $\frac{1}{4}$  in. broad, closely strongly veined; edge not ciliated. Peduncle slender, 6–8 in. long. Flowers 1–2 to an umbel, sessile; spathe-valves lanceolate, 3 in. long, connate in the 1-flowered form. Perianth-tube curved, 4–5 in. long; limb suberect, rather shorter than the tube; segments oblong, connivent, obtuse, minutely cuspidate, an inch broad, banded with red-purple. Filaments an inch shorter than the limb; anthers linear,  $\frac{1}{2}$  in. long. Style overtopping the anthers.

Hab. Central Africa, in Djur-land, discovered by Dr. Schweinfurth in 1860. We have a sketch of an allied plant, made by Mr. T. Baines in Nov.,

1861, from Koobie, in the Transvaal, and a garden specimen from Sir C. Strickland of a plant from Lake Nyassa, with "broad leaves," two shortly pedicellate flowers and more acute perianth-segments.

58. *C. CAREYANUM* Herb. in Bot. Mag. t. 2466. *C. ornatum* var. *Careyanum* Herb.—Bulb globose, 3-4 in. diam., with reddish brown tunics and a short neck. Leaves 8-10, lorate, spreading, undulated, bright green, thin, 1-2 ft. long, 2-3 in. broad; edge entire. Peduncle a foot long, subterete, green. Flowers 4-6 in an umbel; pedicels very short; spathe-valves deltoid, green, 2-3 in. long. Perianth-tube curved, greenish, 3-4 in. long; limb horizontal, as long as the tube; segments oblong, acute, an inch broad, faintly tinged with red in the centre. Stamens a little shorter than the segments; anthers linear,  $\frac{1}{2}$  in. long. Style reaching to the tip of the segments. Ovules 6-8 in a cell.

Hab. Mauritius and Seychelles, in marshy ground. Described from a plant that flowered at Kew in Nov., 1877. Scarcely more than a variety of *C. latifolium*.

59. *C. ABYSSINICUM* Hochst. in Schimp. Pl. Abyss. No. 1374.—Bulb ovoid, 3 in. diam.; neck short. Leaves about six to a bulb, linear, suberect, a foot long,  $\frac{1}{2}$ -1 in. broad, narrowed gradually to the point, closely veined; edge scabrous. Peduncle moderately stout, 1-2 ft. long. Flowers 4-6 in an umbel; pedicels none or very short; spathe-valves green, ovate-lanceolate, 2 in. long. Perianth-tube slender, curved,  $1\frac{1}{2}$ -2 in. long; limb horizontal or suberect, 2-3 in. long; segments oblong, acute,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad. Filaments  $\frac{1}{2}$ - $\frac{3}{4}$  in. long; anthers linear-oblong,  $\frac{1}{4}$ - $\frac{1}{2}$  in. long.

Hab. Mountains of Abyssinia, first gathered by Schimper in 1838. Distinguished by its short stamens and short perianth-tube.

60. *C. DISTICHUM* Herb. Amaryll. 260. *Amaryllis ornata* Gawl. in Bot. Mag. t. 1253, excl. syn.—Bulb small, globose. Leaves about 10, distichous, linear, firm in texture, channelled down the face, tapering to the point, a foot long, under an inch broad low down. Peduncle about a foot long. Flower usually solitary, sessile; spathe-valves lanceolate, 2-3 in. long. Perianth-tube curved, 5-6 in. long; limb horizontal, about 4 in. long; segments oblong, acute, connivent, an inch broad, keeled with bright red. Stamens and style reaching nearly to the tip of the segments.

Hab. Sierra Leone. Differs from *C. yuccæflorum* by its distichous leaves. Three different plants are figured as *Amaryllis ornata* in the 'Botanical Magazine,' viz., *C. zeylanicum*, *giganteum*, and the present species.

61. *C. YUCCÆFLORUM* Salisb. Parad. t. 52. *C. yuccæoides* Herb. *C. Broussonetii* Herb. in Bot. Mag. t. 2121; Lodd. Bot. Cab. t. 668; Bury Hexand. t. 21. *Amaryllis Broussonetii* Red. Lil. t. 62. *A. spectabilis* Andr. Bot. Rep. t. 390. *A. ornata* Ait.—Bulb small, globose, purplish, without any distinct neck. Leaves 10-12 to a bulb, multifarious, linear, firm in texture, closely veined, 1-1 $\frac{1}{2}$  ft. long, about an inch broad; edge scabrous. Peduncle slender, a foot long. Flowers 1-2 in an umbel, sessile; spathe-valves green, lanceolate, 2-3 in. long. Perianth-tube greenish, curved, 4-5 in. long; limb horizontal, 3-4 in. long; segments oblong, acute, connivent,  $\frac{3}{4}$ -1 in. broad, banded with red on the back. Filaments

about an inch shorter than the segments; anthers linear-oblong,  $\frac{1}{4}$  in. long. Style reaching nearly to the tip of the segments.

Hab. Sierra Leone. There is a specimen at the British Museum from Kew Gardens in 1785, so that it is no doubt the original *ornata* of Aiton, who cites the younger Linnæus under his diagnosis, and says it was introduced by Lord Petre in 1740. A plant gathered by Welwitsch in Angola (4015) is probably the same species.

62. *C. SANDERIANUM* Baker in Gard. Chron. n. s. xxii. 102; Florist and Pomol. 1784, 157, with woodcut. *C. ornatum* Bury Hexand. t. 18. *C. Broussonetianum* var. *pluriflorum* Herb. — Bulb globose, 2 in. diam.; neck 2–3 in. long. Leaves 10–12, thin, ensiform,  $1\frac{1}{2}$ –2 ft. long, 1– $1\frac{1}{2}$  in. broad, narrowed from the middle to a long point, much crisped at the denticulate margin. Peduncle a foot long. Flowers 3–6 in an umbel, sessile; spathe-valves 3–4 in. long. Perianth with a curved tube 5–6 in. long; segments oblong-lanceolate, acute, connivent, 3–4 in. long, under an inch broad, keeled with bright red. Stamens nearly as long as the limb; anthers linear,  $\frac{1}{3}$  in. long. Style reaching to the tip of the segments.

Hab. Corisco Island, Mann 1877! Sierra Leone. Described from a specimen sent from Messrs. Sander and Co., of St. Alban's, in 1884. Nearly allied to *C. scabrum* Herb.

63. *C. SCABRUM* Herb. in Bot. Mag. t. 2180; Bury Hexand. t. 32. *C. scaberrimum* Herb. — Bulb large, ovoid, purplish-brown; neck short. Leaves a dozen or more, lorate, bright green, 2–3 ft. long,  $1\frac{1}{2}$ –2 in. broad, firm in texture, closely veined; edge scabrous. Peduncle stout, 1–2 ft. long. Flowers 4–8 in an umbel; pedicels none or very short; spathe-valves broad, 2–3 in. long. Perianth-tube curved, greenish, 3–5 in. long; limb  $2\frac{1}{2}$ –3 in. long; segments oblong, acute, distinctly keeled with bright red. Filaments rather shorter than the perianth-segments; anthers linear,  $\frac{1}{2}$  in. long. Style reaching to the tip of the perianth-segments. Ovules 5–6 in a cell.

Hab. Widely spread in Tropical Africa from Guinea across to Abyssinia and Kordofan. It is said to have been imported from the Azores and Brazil, but probably is not native there. I cannot distinguish *C. Ruppelianum* Fresen., except as a mere variety, and this is the plant described by A. Richard in 'Flora Abyssinica' as *Hippeastrum vittatum*.

64. *C. FIMBRIATULUM* Baker in Journ. Bot. 1878, 196. — Leaves thin, lorate, closely veined, glaucous-green, tapering to a point, 2–3 ft. long, 2 in. broad low down; edge ciliated by small membranous scales. Peduncle 2 ft. long. Flowers 3–7 in an umbel; pedicels none or very short; spathe-valves deltoid, 2–3 in. long. Perianth-tube greenish, 4–5 in. long; limb 3 in. long; segments oblong-lanceolate, connivent, under an inch broad, with a distinct band of red down the middle. Filaments an inch shorter than the segments; anthers linear,  $\frac{1}{2}$  in. long. Ovules several in each cell.

Hab. Angola in the province of Loanda, in marshy meadows at a low level, flowering in March, Welwitsch 4018! 4019! Nearly allied to *C. scabrum* Herb.

65. *C. CRASSIPES* Baker in Gard. Chron. 1887, ii. 126. — Bulb very large, conical. Leaves lorate, dark green, suberect, 4 in.

broad. Peduncle stout, compressed, under a foot long. Flowers 15–20 in an umbel; spathe-valves broad, deciduous; pedicels reach 1–1½ in. long. Ovules 6–8 in a cell. Perianth-tube green, nearly straight, 3 in. long; limb suberect, 2½ in. long; segments lanceolate, ½ in. broad at the middle, white, with a red centre, not distinctly keeled. Filaments purple, nearly as long as the perianth-segments; anthers above ¼ in. long.

Hab. Country not known. Flowered by Sir C. W. Strickland, July, 1887, the bulb purchased of Messrs. E. G. Henderson and Co.

66. *C. KIRKII* Baker in Bot. Mag. t. 6512. — Bulb globose, 6–8 in. diam.; neck half a foot long. Leaves lorate, acute, reflexing, bright green, 3½–4 ft. long, 4–4½ in. broad, closely veined; edge scabrous. Peduncles stout, compressed, 1–1½ ft. long, sometimes 2–3 to a bulb. Flowers 12–15 in an umbel; pedicels none or very short; spathe-valves broad, reddish brown, 3–4 in. long. Perianth-tube more or less curved, greenish, 4 in. long; limb horizontal, longer than the tube; segments connivent, oblong, acute, above an inch broad, broadly keeled with bright red. Filaments white, 1½ in. shorter than the segments; anthers linear, ½ in. long. Style nearly as long as the limb. Ovules several, superposed.

Hab. Zanzibar. Described from a bulb sent by Sir John Kirk, that flowered at Kew in September, 1879. Mombasa *Hildebrandt* 1228 b! *Brunsvigia?* *Massaiana*, L. Linden and Rodigas in Ill. Hort. 1887, t. 55, is no doubt a *Crinum* nearly allied to *C. Kirkii*. The tube is half a foot long in our type specimen, but the leaves are absent.

67. *C. PODOPHYLLUM* Baker in Bot. Mag. t. 6483. — Bulb subglobose, 1½–2 in. diam., without any distinct neck. Leaves 5–6 to a bulb, oblanceolate, acute, a foot long, 1½–2 in. broad at the middle, subpetiolate, thin, laxly veined. Peduncle greenish, compressed, slender, a foot long. Flowers 2 in an umbel, sessile; spathe-valves lanceolate, 1½–2 in. long. Perianth-tube slender, curved, 5–6 in. long; limb suberect, 3 in. long; segments oblong-spathulate, pure white. Filaments nearly as long as the limb; anthers linear, ¼–¾ in. long. Style as long as the stamens.

Hab. Old Calabar. Described from a plant sent by the Rev. Hugh Goldie, which flowered at Kew in Nov., 1879; and another sent by Mr. Kalbreyer, flowered by Messrs. Veitch in 1880. Closely allied to *C. giganteum*. I have seen a form with the peduncle entirely suppressed.

68. *C. GIGANTEUM* Andr. Bot. Rep. t. 169; Red. Lil. t. 181; Bury, Hexand. t. 17. *C. petiolatum* var. *spectabile* Herb. *C. vanil-lodorum* Welw.; Baker in Journ. Bot. 1878, 196; Ill. Hort. n. s. t. 617. *Amaryllis gigantea* Ait. *A. latifolia* Lam. *A. ornata* Gawl. in Bot. Mag. t. 923. *A. candida* Tratt. Tab. t. 488. — Bulb 5–6 in. diam.; neck short. Leaves a dozen or more, thin, green, 2–3 ft. long, 3–4 in. broad at the middle, acute, much narrowed towards the base, laxly distinctly veined, with distinct cross veinlets. Peduncle stout, green, compressed, sometimes 2–3 ft. long. Flowers generally 4–6, rarely 8–12, in an umbel; pedicels none or very short; spathe-valves broad, green, 3–4 in. long. Perianth-tube slender, curved, 4–7 in. long; limb campanulate, 3–4 in. long; segments oblong, obtuse, pure white, much imbricated. Filaments

pure white, an inch shorter than the segments; anthers linear,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Style reaching to the tip of the segments.

Hab. Central and West Tropical Africa, introduced into cultivation by Afzelius about 1780. I have seen it from Jamaica, no doubt introduced.

69. *C. LINEARE* Linn. fil. Suppl. 195. *C. revolutum* Herb. *Amaryllis revoluta* L'Herit.; Gawl. in Bot. Mag. t. 915. *A. revoluta* var. *gracilior*, Bot. Mag. t. 623. *Crinum algoense* Herb.—Bulb small, ovoid. Leaves linear,  $1\frac{1}{2}$ –2 ft. long,  $\frac{1}{2}$  in. broad, glaucous-green, channelled down the face. Peduncle slender, subterete, a foot long. Flowers 5–6 in an umbel; spathe-valves  $1\frac{1}{2}$ –2 in. long; pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Perianth-tube slender, curved,  $1\frac{1}{2}$ – $2\frac{1}{2}$  in. long; segments oblanceolate, acute, 2–3 in, long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad, tinged with red outside. Filaments bright red, shorter than the segments; anthers linear,  $\frac{1}{3}$  in. long. Style reaching to the tip of the segments.

Hab. Cape Colony, *Thunberg!* *Burchell!* There is a specimen at the British Museum, dried from Kew Gardens, in 1779, but it is not in cultivation now.

70. *C. VARIABLE* Herb. Amaryll. 268, t. 44, fig. 23. *Amaryllis variabilis*, Jacq. Hort. Schoen. iv. 14, t. 429. *A. revoluta* var. *robustior* Gawl. in Bot. Reg. t. 615. *Crinum variable* var. *roseum* Herb. in Bot. Reg. 1844, t. 9. *C. crassifolium* Herb.—Bulb ovoid, 3–4 in. diam.; neck short. Leaves 10–12 to a bulb, linear, green, weak,  $1\frac{1}{2}$ –2 ft. long, 2 in. broad. Peduncle erect, compressed, 1– $1\frac{1}{2}$  ft. long. Flowers 10–12 to an umbel; spathe-valves deltoid, 2–3 in. long; pedicels  $\frac{1}{2}$ –1 in. long. Perianth with a curved greenish tube  $1\frac{1}{2}$ –2 in. long; segments oblong, acute,  $2\frac{1}{2}$ – $3\frac{1}{2}$  in. long, flushed red down the back. Filaments red, an inch shorter than the segments; anthers linear,  $\frac{1}{2}$  in. long. Style as long as the segments. Ovules 3 or more in a cell.

Hab. Cape Colony; Southern Provinces and Kaffraria, Not, I believe, in cultivation now.

71. *C. CAMPANULATUM* Herb. in Bot. Mag. sub t. 2121. *C. aquaticum* Burchell; Bot. Mag. t. 2352. *C. caffrum* Herb. *Hæmanthus hydrophilus* Thunb.—Bulb small, ovoid. Leaves linear, deeply channelled down the face, reaching a length of 3–4 ft. Peduncle slender, a foot or more long. Flowers 6–8 in an umbel; spathe-valves lanceolate-deltoid, reddish brown,  $1\frac{1}{2}$ –2 in. long; pedicels  $\frac{1}{2}$ –1 in. long. Perianth with a slender curved cylindrical tube  $1\frac{1}{2}$ –2 in. long; limb campanulate, about as long as the tube; segments oblong, obtuse, connivent, rose-red. Stamens an inch long; anthers linear-oblong,  $\frac{1}{4}$  in. long. Style as long as the perianth. Ovules 6–8 in a cell.

Hab. Cape Colony; Eastern Provinces and Kaffraria, in ponds. Introduced by Burchell, about 1817. A very distinct species, which has been flowered of late years several times by Sir C. W. Strickland.

72. *C. IMBRICATUM* Baker in Gard. Chron. 1881, ii. 784. — Bulb very large, globose. Leaves lorate, very thin, 3 ft. long, 3 in. broad at the middle, narrowed to 2 in. near the base; veins distant, very distinct. Peduncle stout, a foot or more long. Flowers 5–6 in an

umbel; spathe-valves broad, 3-4 in. long; pedicels an inch long. Perianth pure white, with a slender curved tube 3 in. long, and campanulate limb as long as the tube, with oblong obtuse imbricated segments. Filaments declinate, an inch shorter than the segments; anthers linear,  $\frac{3}{4}$  in. long. Style reaching to the tip of the perianth.

Hab. Transkeian Kaffraria; Butterwick Forest, *Macowan* 2207! Allied to *C. giganteum* Andr.

73. *C. MOOREI* Hook. fil. in Bot. Mag. t. 6113; Gard. Chron. 1887, ii. fig. 101. *C. Makoyanam* Carriere in Rev. Hort, 1877, 417, fig. 75. *C. Colensoi*, *Mackenii*, and *natalense* Hort.—Bulb ovoid, very large, copiously stoloniferous, with a neck sometimes a foot long. Leaves 12-15 to a bulb, spreading, thin, lorate, bright green, 2-3 ft. long, 3-4 in. broad; laxly distinctly veined; edge entire. Peduncle green, moderately stout, 2-3 ft. long. Flowers 6-10 in an umbel; spathe-valves large, thin; pedicels  $1\frac{1}{2}$ -3 in. long. Perianth with a curved tube 3-4 in. long, and a funnel-shaped limb of about the same length, with oblong subacute segments 1- $1\frac{1}{2}$  in. broad. Filaments pink, an inch shorter than the segments; anthers linear,  $\frac{1}{2}$  in. long. Style reaching to the tip of the perianth. *C. Schmidtii* Regel Gartenfl. t. 1072, is a form with pure white flowers.

Hab. Natal and Kaffraria, now widely spread in gardens. Our first knowledge of it was from a sketch sent by Bishop Colenso in 1858. It was named by Sir J. D. Hooker after the late Dr. David Moore, of Glasnevin, who was one of the first to grow it successfully, and who sent the specimen drawn for the 'Botanical Magazine.'

74. *C. FORBESIANUM* Herb. Amaryll. 267; Baker in Bot. Mag. t. 6545. *Amaryllis Forbesii* Lindl.—Bulb globose, 6-8 in. diam., without a distinct neck. Leaves not fully developed till after the flowers, 10-12 to a bulb, spreading, lorate, obtuse, glaucous, closely veined, 3-4 ft. long, 3-4 in. broad; edge conspicuously ciliated. Peduncle stout, compressed, a foot long. Flowers 30-40 in an umbel; spathe-valves deltoid, red-tinted, 3-4 in. long; pedicels stout,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Perianth-tube about 3 in. long, nearly straight in the central flowers; limb funnel-shaped, 4- $4\frac{1}{2}$  in. long; segments oblong, acute, connivent,  $\frac{3}{4}$ -1 in. broad, white, with a distinct band of red down the back. Filaments bright red, nearly as long as the segments; anthers linear,  $\frac{1}{2}$  in. long. Style as long as the perianth.

Hab. Delagoa Bay, discovered by Forbes about 1824 and regathered by Mr. J. J. Monteiro in 1876. Described from a plant that flowered at Kew in Oct., 1878. *Brunsvigia? magnifica*, L., Linden and Rodigas in Ill. Hort. n. s. t. 552, is a *Crinum* either identical with *Forbesianum* or near it.

75. *C. LONGIFOLIUM* Thunb. Prodr. 39. *Amaryllis longifolia* Linn. Sp. Plant. 421; Jacq. Ic. t. 362; Red. Lil. t. 347; Gawl. in Bot. Mag. t. 661. *C. capense* Herb. *Amaryllis capensis* Miller. *A. bulbisperma* Burm. *C. riparium* Herb.—Bulb ampullæform, narrowed gradually into a long cylindrical neck. Leaves a dozen or more to a bulb, ensiform, acute, glaucous, moderately firm in texture, 2-3 ft. long, 2-3 in. broad; edge scabrous. Peduncle a

foot or more long, subterete. Flowers 6–12 to an umbel; spathe-valves 2–3 in. long; pedicels 1–2 in. Perianth-tube curved, 3–4 in. long; limb about as long; segments oblong, acute,  $\frac{3}{4}$ –1 in. broad, usually flushed with red down the back, rarely pure white. Stamens nearly as long as the perianth. Style reaching to its tip.

Hab. Universally spread through Cape Colony from the Southern Provinces to Natal. The most hardy of all the Crinums in England and the only one grown generally out of doors. Var. *Farinianum* Baker in Gard. Chron. 1887, i. 833, collected by M. Farini in the Kalihari Desert, has pink narrowly funnel-shaped flowers, very long leaves, and a bulb with a very long neck.

76. *C. MACOWANI* Baker in Gard. Chron. 1878, 298; Bot. Mag. t. 6381.—Bulb globose, sometimes 9–10 in. diam., with a neck 6–9 in. long. Leaves 12–15 to a bulb, spreading, lorate, bright green, thin, 2–3 ft. long, 3–4 in. broad. Peduncle stout, green, 2–3 ft. long. Flowers 10–15 in an umbel; spathe-valves very large; pedicels 1–2 in. long. Perianth with a curved greenish tube 3–4 in. long, and a funnel-shaped limb of about the same length, with oblong acute pinkish segments 1–1½ in. broad. Stamens declinate, a little shorter than the limb; anthers linear,  $\frac{1}{2}$  in. long. Style as long as the stamens.

Hab. South-western frontier of Natal, *Macowan* 2122! Described from a plant that flowered at Kew in Jan., 1878. Closely allied to *C. latifolium* Linn.

77. *C. SUBMERSUM* Herb. in Bot. Mag. t. 2463.—Bulb ovoid-oblong, reddish, 3 in. diam. Leaves lorate, acute, pale green; edge scabrous. Peduncle green, compressed, 1½ ft. long. Flowers about 8 in an umbel, sessile; spathe-valves 3–4 in. long. Perianth-tube curved, greenish, 5 in. long; segments oblong, acute, 4 in. long, white, under an inch broad, with a distinct red keel. Stamens and style nearly as long as the segments.

Hab. Rio Janeiro. Known to me only from the figure and description. It must be very near *C. scabrum*. Herbert finally regarded it as a hybrid between *scabrum* and *erubescens*.

78. *C. LONGIFLORUM* Herb. Amaryll 271. *Amaryllis longifolia* var. *longiflora* Ker. in Bot. Reg. t. 303.—Bulb ovoid, 3–4 in. diam., with a distinct neck. Leaves lorate, 4–5 ft. long, 2 in. broad, moderately firm in texture, closely veined, narrowed to the point, not glaucous; edge slightly scabrous. Flowers 6–8 in an umbel; pedicels short; spathe-valves deltoid, 3–4 in. long. Perianth-tube greenish, curved, 3–4 in. long; limb funnel-shaped, as long as the tube; segments oblong, acute, connivent, flushed with red in the middle, but without a distinct band. Filaments much shorter than the limb; anthers linear,  $\frac{1}{2}$  in. long. Ovules 6–8 in a cell.

Hab. According to Grisebach this is native in Jamaica and Antigua. If not true native it is perhaps a large variety of *C. longifolium*. It was figured in 1818, from a plant received by Mr. Griffin from a garden in Jamaica.

79. *C. VIRGINEUM* Mart. in Roem. et Schultes Syst. Veg. vii. 855. *C. petiolatum* var. *virginum* Herb.—Bulb large, brown. Leaves lorate, thin, 2–3 ft. long, 3–4 in. broad at the middle, narrowed to an acute apex and to 1 in. above the base; veins as lax as in *giganteum* and connected by distinct cross veinlets. Flowers about 6 to an umbel; pedicels none or very short; spathe-

valves 3-4 in. long. Perianth-tube curved, greenish, 3-4 in. long; segments as long as the tube, pure white, connivent, acute. Filaments much shorter than the limb; anthers linear,  $\frac{1}{2}$  in. long. Style overtopping the stamens.

Hab. South Brazil, originally described from plants found by Consul Langsdorff between Mandioca and Porto d'Estrella. We have at Kew three sheets dried by Burchell, from a garden at San Bento in Oct., 1826. It comes about midway between *C. erubescens* and *C. giganteum*. The little-known *C. Binsii*, of Hoffmannsegg, from Rio Janelro, would seem to be like this in leaf, with a flower 4-5 in. long.

#### *Hybrid Crinums.*

A large number of Crinums were artificially hybridised by Dean Herbert and his contemporaries. The species experimented upon were principally *longifolium* (*capense*), *americanum*, *erubescens*, *asiaticum*, *scabrum*, and *zeylanicum*. In Kunth's 'Enumeratio,' vol v. p. 582-3, twenty-three hybrids are enumerated under Latin names and their parentage given, and in the second edition of Sweet's 'British Flower Garden,' p. 512, there are thirty-two. Reference should also be made to Herbert's papers in Trans. Hort. Soc. vol. iii. p. 187 (with a figure of *C. Govenianum*) Amaryll. 272, Journ. Hort. Soc. ii. 14, and to Bury's 'Hexandria,' tab. 30, where a hybrid between *pedunculatum* and *zeylanicum* is figured. The only recent hybrid with which I am acquainted is *C. Powellii*, a cross between *longifolium* and *Moorei*.

*C. POWELLII* Hort.—Bulb globose, with a short neck. Leaves about 20, spreading, ensiform, acuminate, bright green, 3-4 ft. long, 3-4 in. broad low down, smooth on the edge. Peduncle compressed, glaucous, 2 ft. long. Flowers about 8 in an umbel; pedicels 1-1 $\frac{1}{2}$  in. long; spathe-valves large, oblong-lanceolate. Perianth-tube curved, greenish, 3 in. long; segments oblong-lanceolate, acute, reddish, 4 in. long, an inch broad at the middle. Stamens much shorter than the perianth-segments. Style bright red upwards.

Hab. Described from a living plant in the garden of Sir W. Bowman, at Jolwynds, Dorking, July, 1887.

#### 29. AMARYLLIS Linn. ex parte.

*Perianth* funnel-shaped, with a short tube and 6 subequal oblong acute connivent segments. *Stamens* inserted at the throat of the tube; filaments long, filiform; anthers linear, versatile. *Ovary* 3-celled; ovules many in a cell; style filiform, declinate; stigma capitate. *Capsule* globose, bursting irregularly. *Seeds* like that of a *Crinum*.

The name *Amaryllis* is still universally given in gardens to the species and hybrids of *Hippeastrum*, which has a flower like that of the present plant, but entirely different capsule and seeds.

1. *A. BELLADONNA* Linn. Sp. Pl. 421; Bot. Mag. t. 733; Red. Lil. t. 180. *A. rosea* Lam. *A. pudica* Gawl. *Coburgia Belladonna* Herb. — Bulb 3-4 in. diam.; tunics rather fibrous. Leaves 7-9, produced after the flowers, lorate, distichous, dull green, 1-1 $\frac{1}{2}$  ft.

long, under an inch broad. Peduncle solid, compressed, 1-1½ ft. long. Flowers 6-12 in an umbel, produced in March and April at the Cape; pedicels 1-1½ in. long; spathe-valves 2, large, green. Perianth rose-red in the type; tube ½ in. long; segments 2-3 in. long, ½-¾ in. broad above the middle. Capsule globose, 1 in. diam. *A. pallida* Red. Lil. t. 479, differs only by its pale flowers.

Var. *A. BLANDA* Gawl. in Bot. Mag. t. 1450. *Coburgia blanda* Herb. — Leaves more sheathing at the base, longer and broader, reaching 2-3 ft. Flowers larger, lighter in colour, and opening wider; segments 3-4 in. long, 1-1¼ in. broad.

Hab. Southern Provinces of Cape Colony. Introduced into cultivation in 1712. Many forms are named in gardens. Sweet calls the genus *Belladonna*, and admits four species, *B. purpurascens*, *pallida*, *pubica*, and *blanda*. See also *purpurascens*, Flore des Serres, t. 911; and *rubra*, Flore des Serres, t. 1415.

### 30. AMMOCHARIS Herb.

*Perianth* funnel-shaped, with a stout cylindrical tube and 6 equal ascending oblanceolate-unguiculate segments. *Stamens* inserted at the throat of the perianth-tube, about as long as the segments; filaments filiform, equally divergent; anthers linear-oblong, versatile. *Ovary* ampullæform, narrowed into a distinct neck, 3-celled; ovules numerous, superposed, sessile; style filiform, a little longer than the stamens; stigma capitate. *Fruit* and seeds unknown.

1. *A. FALCATA* Herb. App. 17. *Amaryllis falcata* L'Herit. *Hamanthus falcatus* Thunb. *Crinum falcatum* Jacq. Hort. Vindob. iii. 34, t. 60. *Ammocharis coranica* Herb. *Amaryllis coranica* Burchell in Bot. Reg. t. 139 & 1219 (var. *pallida*). Genus *Palinetes* Salisb.—Bulb ovoid, reaching a diam. of 6-9 in., not produced into a neck; tunics very numerous, brown, membranous. Leaves bifarious, lorate, spreading, produced before the flowers in summer or autumn, reaching a length of 1-2 ft., an inch broad, green, glabrous. Peduncle stout, lateral, ancipitous, ½-1 ft. long. Flowers 20-40 in an umbel, bright red, fragrant, produced in the middle of winter; pedicels 1-1½ in. long; spathe-valves large, ovate. Perianth-tube ½ in. long; segments 1½-2 in. long.

Hab. Central and Eastern regions of Cape Colony, from Beaufort and Port Elizabeth, ascending the mountains to 5000 ft., northward to Natal. Probably the fruit figured by Gawler in Bot. Mag. t. 1443, is that of a *Brunsvigia*, mismatched with the flowers.

### 31. BRUNSVIGIA Heist.

*Perianth* funnel-shaped, erect or slightly curved; tube short; segments lanceolate or oblong-lanceolate, subequal. *Stamens* long, declinate, inserted at the throat of the perianth-tube, three shorter; filaments filiform; anthers oblong, versatile. *Ovary* turbinate, 3-celled; ovules numerous, superposed; style filiform, declinate; stigma capitate. *Capsule* turbinate, acutely triquetrous, narrowed gradually to the base. *Seeds* green, subglobose, furnished with a distinct funiculus.—*Rootstock* a large tunicated bulb. *Leaves* lorate or lingulate, produced after the flowers. *Peduncle* stout, solid.

*Flowers* bright red, copiously umbelled; spathe 2-valved. A large proportion of the dried specimens I have seen are without leaves, and cannot therefore be determined clearly.

Leaves lorate . . .	Sp. 1-4.
Leaves lingulate . . .	Sp. 5-8.
Flowers unknown . . .	Sp. 9.

1. *B. JOSEPHINÆ* Gawl. in Bot. Reg. t. 192-193. *Amaryllis Josephinæ* Red. Lil. t. 370-372. *A. Josephiniana* Herb. *A. Griffini* Herb. — Bulb 5-6 in. diam. Leaves 8-10, lorate, glaucous or greenish, suberect, thick, closely ribbed, 2-3 ft. long, 1½-2 in. broad; edge entire. Peduncle subterete, an inch thick, 1½ ft. long. Flowers 20-30, rarely 50-60, in an umbel; pedicels stout, stiffly erect, ½-1 ft. long; spathe-valves small, broad, with a large cusp. Perianth bright red, 2½-3 in. long; tube subcylindrical, ½ in. long; segments lanceolate. Stamens as long as the segments. Capsule smaller, less conical, and not so strongly angled as in *B. gigantea*.

Hab. Central and Eastern districts of Cape Colony, Kaffraria, Orange Free State, and Natal. It was originally described and figured from a plant that flowered in the garden of Malmaison, the bulb of which was purchased in Holland by the Empress Josephine, after whom it was named.

2. *B. GRANDIFLORA* Lindl. Bot. Reg. t. 1335.—Bulb large, ovoid. Leaves lorate, obtuse, suberect, pale green; edge scabrous. Peduncle compressed, slightly glaucous, 1½ ft. long. Flowers about 30 in an umbel; pedicels 3-6 in. long; spathe-valves deltoid-cuspidate. Perianth pale red, 2 in. long; tube scarcely any; segments oblong-lanceolate. Stamens rather shorter than the perianth-segments.

Hab. Cape Colony. Known only from the figure, which was drawn from a plant flowered in London by Mr. Tate in 1829. Herbert's var. *Banksiana* is probably founded on a mismatching of leaf and flower.

3. *B. SLATERIANA* Benth. Gen. Plant. iii. 727. *Ammocharis Slateriana* Kunth. *Amaryllis Banksiana* Lindl. in Bot. Reg. 1842, t. 11. — Bulb globose, 4-5 in. diam. Leaves about 6, lorate, glaucous. Peduncle stout, compressed, ½ ft. long. Flowers 15-20 in an umbel; pedicels 3-4 in. long; spathe-valves lanceolate-deltoid. Perianth bright rose-red, 1½ in. long; tube very short; segments lanceolate. Stamens and style shorter than the perianth-segments.

Hab. Cape Colony. Known only from the figure cited, which was drawn from a plant flowered by J. H. Slater, Esq., at Newick Park, Uckfield, in 1849.

4. *B. MINOR* Lindl. in Bot. Reg. t. 954. *B. humilis* Ecklon.—Bulb ovoid, 2-3 in. diam. Leaves 3-4, lorate, half a foot long, an inch broad. Peduncle stout, 6-9 in. long. Flowers 12-40 in an umbel; pedicels comparatively slender, 3-6 in. long; spathe-valves ovate, reflexing, 1½ in. long. Perianth pale red, 1¼-1½ in. long; tube very short; segments lanceolate. Stamens as long as the perianth-segments; anthers oblong, ¼ in. long. Capsule acutely turbinate, 1 in. long.

Hab. Uitenhage and other South-eastern provinces of Cape Colony. A western plant sketched by Masson about 1795, and two forms gathered by Drege (8546) in the province of Clanwilliam, are like this in flower, but the leaf is not known.

5. *B. GIGANTEA* Heist. Monog., with figure. *B. multiflora* Ait.; Gawl. in Bot. Mag. t. 1619. *Amaryllis orientalis* Linn.; Jacq. Hort. Schoen. i. 38, t. 74. *Hæmanthus orientalis* Thumb. *Brunsvigia orientalis* Ecklon. *B. rubricaulis* Roem.—Bulb very large. Leaves about 4, spreading, lingulate, closely ribbed, 3–5 in. broad, usually under a foot long. Peduncle red or green, 8–12 in. long, as thick as a man's finger. Flowers 20–30 in an umbel; pedicels stout, strongly ribbed, 4–6 in. long; spathe-valves deltoid. Perianth curved, bright red, 2–2½ in. long; tube broad, ¼–⅓ in. long; segments lanceolate. Stamens and style rather exerted; anthers ⅓ in. long. Capsule acutely triquetrous, 2–3 in. long.

Hab. South-western provinces of Cape Colony. Introduced into cultivation about 1700, and figured by Sweet, Ferrari, Barrelier, and Morison. The genus was named by Heister in 1753, in compliment to the reigning Duke of Brunswick.

6. *B. COOPERI* Baker in Saund. Ref. Bot. t. 330. — Bulb ovoid, 3–4 in. diam. Leaves 4–6, lingulate, spreading horizontally, 3–4 in. broad, thick in texture, closely ribbed, minutely granulated; edge scabrous. Peduncle very stout, above a foot long. Flowers 12–16 in an umbel; pedicels stout, 4–6 in. long; spathe-valves broad, ovate. Perianth bright red, 2–2½ in. long; tube very short; segments oblong-lanceolate. Stamens as long as the perianth-segments. Capsule turbinate, acutely angled, 1½–2 in. long.

Hab. Cape Colony; mountains of the Eastern provinces, ascending to 5000–6000 ft. on the Witbergen, *Drege* 3518!

7. *B. STRIATA* Ait. Hort. Kew. ed. 2, ii. 231. *Amaryllis striata* Jacq. Hort. Schoen. i. 36, t. 70. *A. nervosa* Poir. — Bulb ovoid, the size of a walnut. Leaves 4–6, lingulate, spreading or suberect, 4–6 in. long, 2½ in. broad, subcoriaceous, closely strongly ribbed; edge scabrous. Peduncle 6–8 in. long, ½ in. diam. Flowers 10–20 in a dense umbel; pedicels slender, 1–3 in. long; spathe-valves ovate, 1–1½ in. long. Perianth bright red or rose-red, suberect, 1–1¼ in. long; tube cylindrical, ¼ in. long; segments oblong-lanceolate. Stamens and style exerted. Capsule comparatively small.

Hab. Cape Colony; South-western provinces. Sketched by Masson in 1788.

8. *B. RADULA* Ait. Hort. Kew. ed. 2, ii. 230. *Amaryllis Radula* Jacq. Hort. Schoen. i. 35, t. 68. *Coburgia Radula* Herb. — Bulb globose, larger than a hazel-nut. Leaves 2, spreading, lingulate, obtuse, 2–3 in. long, 1–1¼ in. broad, covered all over the surface with rough papillæ. Peduncle ancipitous, not more than 2–3 in. long. Flowers 3–5 in an umbel; pedicels 1–1½ in. long; spathe-valves ovate, reddish, ½ in. long. Perianth ¾–1 in. long; tube very short; segments lanceolate. Stamens as long as the perianth-segments.

Hab. Cape Colony; Karoo, near the Elephant's River. Sketched by Masson in 1790.

9. *B. RADULOSA* Herb. Amaryll. 281, t. 22, fig. 2. — Leaves spreading, lingulate, obtuse, 8–9 in. long, 3–3½ in. broad at the

middle, thick in texture, closely ribbed, rough all over the surface; edge thickened, scabrous. Flowers and fruit unknown.

Hab. Central district of Cape Colony, near the Nu-Gariep, *Burchell!*

10. B. ? *KIRKII* Baker.—A plant sent home by Sir John Kirk from the Usagura Mountains, in East Tropical Africa, is probably a new genus near *Brunsvigia*. It has a small acutely triquetrous turbinate capsule, just like that of *Brunsvigia*, but with only a single globose bulbiform green seed sessile near the apex of the placenta. There are very numerous flowers in an umbel, with slender acutely-angled pedicels  $\frac{1}{2}$ –1 ft. long. Perianth an inch long, with a short tube and lanceolate segments. Stamens and style exerted; anthers small, oblong. Bulb and leaves unknown.

### 32. *NERINE Herb.\**

*Perianth* funnel-shaped, cut down nearly or quite to the ovary, erect or decurved; segments oblanceolate, obtuse, subequal, more or less crisped. *Stamens* inserted at the base of the perianth-segments; filaments filiform, thickened at the base, suberect or declinate, 3 shorter; anthers oblong, versatile. *Ovary* globose, 3-lobed; ovules few in a cell, superposed; style filiform, suberect or declinate, obscurely tricuspidate. *Capsule* globose, deeply 3-lobed, membranous, loculicidally 3-valved. *Seeds* 1 or few in a cell, globose, green. — *Bulb* tunicated, not produced into a neck. *Leaves* long, linear, produced with or a little after the flowers. *Peduncle* usually slender. *Flowers* few or many, pale or deep red, arranged in a centripetal or centrifugal umbel; spathe-valves 2, lanceolate.

Peduncle long, slender. Perianth-limb suberect; stamens and style nearly straight . . . . .	Sp. 1–3.
Peduncle long, slender. Perianth limb slightly irregular; stamens and style declinate.	
Umbel centripetal . . . . .	Sp. 4–6.
Umbel centrifugal . . . . .	Sp. 7–8.
Peduncle short, stout . . . . .	Sp. 9–10.

1. *N. SARNIENSIS* Herb. App. 19. *Amaryllis sarniensis* L.; Curt. in Bot. Mag. t. 294; Red. Lil. t. 35; Jacq. Hort. Schoen. t. 66. *A. dubia* Houtt. *A. Jacquinii* Tratt. *Hemanthus sarniensis* Thunb. *N. insignis* Hort.—Bulb ovoid,  $1\frac{1}{2}$ –2 in. diam.; tunics pale brown. Leaves about 6, bright green, suberect, not curved laterally, developed after the flowers, linear, obtuse, finally a foot long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad. Peduncle slender, rather compressed, 1– $1\frac{1}{2}$  ft. long. Umbel 10–20-flowered, centripetal; pedicels 1–2 in. long; spathe-valves ovate-lanceolate,  $1\frac{1}{2}$  in. long. Perianth erect,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long, bright crimson; segments oblanceolate,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad, equally falcate, hardly at all crisped. Filaments erect, bright red,  $\frac{1}{2}$  in.

\* Reprinted, with slight alteration, from Gard. Chron. 1885, pp. 779–810.

longer than the segments; anthers oblong,  $\frac{1}{8}$  in. long. Style straight, nearly 2 in. long.

Var. N. *PLANTII* Hort. — Peduncle longer than in the type. Flower a duller crimson; segments more distinctly unguiculate.

Var. N. *VENUSTA* Herb. App. 19; Ker in Bot. Mag. t. 1090. — Leaves pale green. Flowers bright scarlet, produced late in September; segments rather wavy, very falcate.

Var. N. *PROFUSA* Hort. — Leaves dark green. Flowers bright scarlet, produced late in August; segments narrower and more acute, less wavy and less falcate than in *venusta*.

Var. N. *ROSEA* Herb. App. 19; Bot. Mag. t. 2124. — Leaves darker than in the type. Flowers rose-red. Seeds oblong.

Var. N. *CORUSCA* Herb. App. 19. *Amaryllis corusca* Gawl. *A. humilis* var., Gawl. in Bot. Mag. t. 1089. — Leaves broader than in the type, bright green, with distinct cross-bars between the main veins. Flowers large, bright scarlet, resembling those of *N. curvifolia*. A connecting link between species 1 and 2. *N. corusca major* Hort. is a form with large flowers, and leaves widening at the middle.

Hab. Southern provinces of Cape Colony. Has been cultivated largely in the Channel Islands for 200 years under the name of the "Guernsey lily," from which the Latin name is derived. It was grown at Paris in 1634, and by Gen. Lambert at Wimbledon in 1659. Flowers generally in September and October. Sir Charles Strickland regards *Plantii* as probably a hybrid between *venusta* and *flexuosa*.

2. *N. CURVIFOLIA* Herb. App. 19. *Amaryllis curvifolia* Jacq. Hort. Schoen. i. 33, t. 64; Gawl. in Bot. Mag. t. 725; Red. Lil. t. 274. — Bulb ovoid,  $1\frac{1}{2}$ –2 in. diam.; tunics pale brown. Leaves about 6, developed after the flowers, linear, obtuse, curved laterally, thicker in texture than in *N. sarniensis*, more or less glaucous, closely veined, finally a foot long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad. Umbel 8–12-flowered, centripetal; pedicels and spathe-valves as in *N. sarniensis*. Perianth erect, bright scarlet,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long; segments oblanceolate,  $\frac{1}{4}$  in. broad, equally falcate, little crisped. Stamens suberect, a little longer than the segments. Style straight, finally 2 in. long.

Var. N. *FOTHERGILLI* Roem. Amaryll. 104. *Amaryllis Fothergilli* Andr. Bot. Rep. t. 163. — More robust in all its parts. Flowers more numerous, between crimson and scarlet.

Hab. Southern provinces of Cape Colony. Introduced in 1788. Flowers in the latter half of September.

3. *N. MOOREI* Leichtlin in Gard. Chron. n. s., vol. xxvi. 681. — Leaves produced a little after the flowers, lorate, bright green, much curved, slightly twisted, 9–12 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad. Peduncle compressed, shorter than the leaves. Flowers 6–9 in a centripetal umbel; pedicels  $\frac{3}{4}$ –1 in. long; spathe-valves longer than the pedicels. Perianth suberect, bright scarlet; segments oblanceolate, crisped,  $1\frac{1}{4}$  in. long,  $\frac{1}{4}$  in. broad. Filaments suberect, longer than the perianth-segments. Style straight,  $1\frac{1}{2}$  in. long.

Hab. Cape Colony. Described from a plant sent to Max Leichtlin from Mr. F. W. Moore, of the Glasnevin Garden.

4. *N. FLEXUOSA* Herb. App. 10. *Amaryllis flexuosa* Jacq. Hort.

Schoen. i. 35, t. 67; Ker in Bot. Reg. t. 172. — Bulb subglobose,  $1\frac{1}{2}$  in. diam. Leaves 4–6, contemporary with the flowers, linear, above a foot long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad, bright green, sometimes rough with pustules on the face. Peduncle slender, subterete, flexuose, sometimes 2–3 ft. long. Flowers 10–20 in a centripetal umbel; pedicels slender, 1–2 in. long; spathe-valves lanceolate, as long as the pedicels. Perianth declinate, cut down nearly to the ovary; segments oblanceolate, crisped, pale pink,  $1-1\frac{1}{4}$  in. long,  $\frac{1}{6}$  in. broad. Stamens declinate, the 3 longer ones rather shorter than the perianth. Style declinate, as long as the stamens.

Var. SANDERSONI Baker. — Leaves broader. Peduncle and pedicels more robust. Perianth-segments less crisped, united in a more distinct cup at the base.

Var. N. PULCHELLA Herb. App. 19; Bot. Mag. t. 2407. — Leaves glaucous, firmer in texture than in the type. Peduncle not flexuose. Perianth-segments pale pink, with a rose-red keel. Stamens and style nearly white.

Var. ANGUSTIFOLIA Baker. *N. pulchella* var. *angustifolia* Baker in Saund. Ref. Bot. t. 329. — Leaves about 8, very narrow, channelled down the face. Pedicels pubescent, 2–3 in. long. Ovary very pubescent.

Hab. Cape Colony, ascending the mountains to 4000–5000 ft., and Natal. Var. *Sandersoni* was sent by Mr. Sanderson from the Transvaal, and var. *angustifolia* by Mr. Thomas Cooper from Orange Free State. Introduced into cultivation by Masson in 1795.

5. N. PUDICA Hook. fil. in Bot. Mag. t. 5901; Flore des Serres, t. 2464. — Bulb globose, 1 in. diam. Leaves 4–6, linear, glaucous, suberect, persistent, 8–9 in. long,  $\frac{1}{4}$ – $\frac{1}{2}$  in. broad. Peduncle slender, subterete,  $1-1\frac{1}{2}$  ft. long. Umbel centripetal, 4–6-flowered; pedicels slender,  $1-1\frac{1}{2}$  in. long; spathe-valves lanceolate, tinged with red, as long as the pedicels. Perianth rather deflexed: segments oblanceolate, scarcely at all crisped,  $1\frac{1}{4}-1\frac{1}{2}$  in. long, white, keeled upwards with pink. Stamens declinate, shorter than the perianth. Style declinate, reaching to the tip of the perianth. Seeds globose.

Var. N. ELWESI Leichtlin. — Leaves broader, bright green, more persistent; midrib prominent. Umbel more compact. Perianth-segments pale rose, with a darker keel, thicker and more waxy in texture.

Hab. Cape Colony. First described from a plant that flowered at Kew in the autumn of 1868.

6. N. FILIFOLIA Baker in Bot. Mag. t. 6547. — Bulb globose, under 1 in. diam., with pale tunics produced into a short neck. Leaves 6–10, contemporary with the flowers, grass green, suberect, very slender, 6–8 in. long. Peduncle slender, terete, green, finely glandular-pubescent, a foot long. Flowers 8–10 in a centripetal umbel; pedicels slender,  $1-1\frac{1}{2}$  in. long; spathe-valves small, green, lanceolate. Perianth deflexed, bright red, an inch long; segments oblanceolate, crisped, only 1–12th to 1–8th in. broad. Stamens declinate, shorter than the perianth-segments. Style equalling the longer stamens.

Hab. Orange Free State, sent to Kew by Mr. Ayres in 1879. Flowers in October and November.

7. *N. HUMILIS* Herb. App. 19. *Amaryllis humilis* Jacq. Hort. Schoen. i. 36, t. 629; Bot. Mag. t. 726; Red. Lil. t. 449. — Bulb ovoid, 1-1½ in. diam. Leaves about 6, linear, bright green, channelled down the face, a foot long, ½ in. broad. Peduncle slender, subterete, ½-1½ ft. long. Flowers 10-20 in a centrifugal umbel; pedicels slender, 1-1½ in. long; spathe-valves lanceolate, as long as the pedicels. Perianth deflexed, pink or rose-red, 1-1¼ in. long; segments oblanceolate, crisped. Stamens declinate, rather shorter than the perianth. Style declinate, as long as the perianth.

Hab. Cape Colony. Differs from *flexuosa* by its dwarfer habit, narrower more deeply channelled leaves, and centrifugal umbel.

8. *N. UNDULATA* Herb. App. 19. *Amaryllis undulata* L.; Mill. Ic. t. 8; Bot. Mag. t. 369; Red. Lil. t. 115; Jacq. Hort. Vind. iii. t. 13. *Hemanthus undulatus* Thunb. *Nerine crispa* Hort. — Bulb ovoid, ¾-1 in. diam. Leaves 4-6, linear, bright green, 1-1½ ft. long, ¼-½ in. broad. Peduncle slender, 1-1½ ft. long. Flowers 8-12 in a centrifugal umbel; pedicels slender, 1-1½ in. long; spathe-valves lanceolate, as long as the pedicels. Perianth-limb pale pink, about ¾ in. long; segments oblanceolate, much crisped. Stamens and style declinate, about as long as the perianth. Capsule ¼ in. diam.; seeds solitary in the cells, globose.

Var. MAJOR Tratt. Tab. t. 394. *N. aucta* Roem. *Amaryllis aucta* Tratt. — Perianth-segments larger and less crisped. A form intermediate between *N. undulata* and *humilis*.

Hab. Cape Colony, northward to the Orange Free State, where it was found by Mr. Thomas Cooper.

9. *N. LUCIDA* Herb. Amaryll. 283, tab. 26, fig. 3. *Amaryllis lucida* Burchell. *A. laticoma* Ker in Bot. Mag. t. 497. *Brunsvigia lucida* Herb. — Bulb 3-4 in. diam., produced into a short neck. Leaves 4-6, contemporary with the flowers, linear, spreading, flaccid, a foot long, ½-¾ in. broad, scabrous on the edge. Peduncle stout, ancipitous, 4-8 in. long. Flowers 20-40 in a centripetal umbel; pedicels 3-4 in. long, straight, moderately stout; spathe-valves ovate-lanceolate, much shorter than the pedicels. Perianth-limb 1½-2 in. long, pale or bright red, cut down to a campanulate tube; segments oblanceolate-unguiculate, ¼ in. broad, hardly at all crisped. Stamens and style declinate, bright red, nearly as long as the segments. Capsule depresso-globose, ⅓-½ in. diam.

Hab. Central regions of Cape Colony, northward to the Gariiep. It was introduced by Burchell, but is not in cultivation at present.

10. *N. MARGINATA* Herb. Amaryll. 283. *Amaryllis marginata* Jacq. Hort. Schoen. i. 34, t. 65. *Brunsvigia marginata* Ait. *Inhafia marginata* Herb. *Elisena marginata* Roem. — Bulb ovoid, 2-3 in. diam., with imbricated dark brown membranous tunics and very strong root-fibres. Leaves about 4, produced after the flowers, spreading, lingulate, obtuse, 6-9 in. long, 2-2½ in. broad, with a reddish crisped cartilaginous edge. Peduncle stout, ancipitous, ½ ft. long. Flowers 12-20 in a centripetal umbel; pedicels 1½-2 in.

long; spathe-valves ovate, shorter than the pedicels. Perianth erect, bright scarlet,  $1\frac{1}{4}$  in. long, cut down to the ovary; segments lanceolate, but little crisped,  $\frac{1}{4}$  in. broad. Stamens and style sub-erect, a little longer than the perianth.

Hab. South-western districts of Cape Colony. Known to me only from the figure cited.

#### Hybrid *Nerines*.

The following hybrid *Nerines* were raised long ago by Dean Herbert, viz. :—

1. *N. Mitchamiae* Herb. Amaryll. t. 5, and *N. versicolor*, between *curvifolia* and *undulata*.
2. *N. Haylocki*, between *curvifolia* and *pulchella*.
3. *N. pulchello-undulata*.
4. *N. Spofforthiae*, between *venusta* and *undulata*.
5. *N. pulchello-humilis*.
6. *N. humilis-undulata*.
7. *N. curvifolio-venusta*.

The following are the principal crosses that have been raised of late years by Messrs. O'Brien, Leichtlin, Cam, and other experimenters :—

8. *N. amabilis*, between *pudica* and *humilis*.
9. *N. Cami*, between *curvifolia* and *undulata*.
10. *N. atrosanguinea*, between *Plantii* and *flexuosa*.
11. *N. cinnabarina*, between *Fothergilli* and *flexuosa*.
12. *N. O'Brieni*, of which *carminata* and *caerulea* are forms, between *pudica* and *Plantii*.
13. *N. erubescens*, between *flexuosa* and *undulata*.
14. *N. elegans*, between *flexuosa* and *rosea*.
15. *N. Meadowbankii*, between *sarniensis* and *Fothergilli*.
16. *N. Mansellii*, between *flexuosa* and *Fothergilli*.
17. *N. roseo-crispa*, between *undulata* and *flexuosa*.
18. *N. excellens* Moore in 'Florist,' 1882, t. 567, between *flexuosa* and *humilis major*.

### 83. STRUMARIA Jacq.

*Perianth* funnel-shaped, cut down to the ovary; segments equal, spreading, oblanceolate. *Stamens* inserted at the base of the segments; filaments filiform, usually united with one another and the dilated style towards the base; anthers oblong, versatile. *Ovary* globose, 3-celled; ovules few, superposed; style swollen and triquetrous towards the base, tricuspidate at the stigmatose apex. *Capsule* small, globose, membranous, loculicidally 3-valved. *Seeds* one or few in a cell, globose, green, bulbiform.—*Rootstock* a tunicated bulb. *Leaves* lorate or linear, contemporary with the flowers. *Peduncle* slender, solid, terete. *Flowers* umbellate, small, whitish or reddish; spathe-valves 2, small, lanceolate. Three out of the four species do not exist in the English herbaria.

Perianth-segments plane. Filaments connate with one another and the style.

Leaves short, lorate . . . . . Sp. 1.

Leaves longer and narrower . . . . . Sp. 2-3.

Perianth-segments crisped. Filaments free . . . . . Sp. 4.

1. *S. TRUNCATA* Jacq. Ic. ii. 47, t. 357. *Hemanthus vaginatus* Thunb. *Hessea vaginata* Herb. Genus *Hymenotryon* Salisb.—Bulb globose, 1 in. diam.; sheathing tunic brown, funnel-shaped, truncate,  $1\frac{1}{2}$ –2 in. long, wrapped round the base of the leaves. Leaves 3–6, lorate, obtuse,  $\frac{1}{2}$  ft. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad. Peduncle slender, a foot long. Flowers 6–15 in an umbel; pedicels 1– $1\frac{1}{2}$  in. long; spathe-valves lanceolate, green. Perianth-segments oblanceolate, plain, pinkish,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Stamens exerted, jointed to one another and the dilated style towards the base.

Hab. Cape Colony. Gathered by Masson at Rhinoceros Fountain in 1793. There is a specimen from Kew Gardens at the British Museum, dried in the year 1800. *S. linguæfolia* Jacq. Ic. t. 356 (*S. Baueriana* Herb.) seems a mere variety with more robust habit, broader leaves, and larger flowers. It has been gathered lately by the Rev. H. Whitehead in Namaqua-land.

2. *S. ANGUSTIFOLIA* Jacq. Ic. ii. 47, t. 359. Genus *Pugionella* Salisb.—Bulb ovoid,  $\frac{1}{2}$  in. diam. Leaves 2, linear,  $\frac{1}{2}$  ft. long,  $\frac{1}{8}$ – $\frac{1}{6}$  in. broad, enclosed at the base in a reddish brown cylindrical sheath. Peduncle slender, a foot long. Flowers 8–10 in an umbel, fragrant; pedicels 1– $1\frac{1}{2}$  in. long; spathe-valves lanceolate. Perianth-segments oblanceolate, plain, pale pink,  $\frac{1}{2}$  in. long. Stamens exerted, united to the acutely triquetrous style towards the base.

Hab. Southern provinces of Cape Colony. Known to me only from Jacquin's figure and description.

3. *S. RUBELLA* Jacq. Ic. ii. 46, t. 358. Genus *Stylago* Salisb.—Bulb ovoid, under an inch in diam. Leaves 3–4, linear, suberect, 6–9 in. long, not enclosed in a funnel-shaped sheath at the base. Peduncle slender, terete, 1– $1\frac{1}{2}$  ft. long. Flowers 6–10 in an umbel, scentless; pedicels an inch long; spathe-valves lanceolate, purplish. Perianth-segments lanceolate, plane, pinkish,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Stamens exerted; filaments united to the clavate-triquetrous style in the lower third.

Hab. Southern provinces of Cape Colony. Known to me only from Jacquin's figure and description.

4. *S. UNDULATA* Jacq. Ic. ii. 50, t. 360. Genus *Eudolon* Salisb.—Bulb ovoid, 1– $1\frac{1}{2}$  in. diam. Leaves 3–4, suberect, lorate, 6–10 in. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad, enclosed at the base in a loose red-brown truncate funnel-shaped sheath. Peduncle slender, terete,  $1\frac{1}{2}$  ft. long. Flowers about 6 in an umbel, scentless; pedicels 1– $1\frac{1}{2}$  in. long; spathe-valves lanceolate, purplish, as long as the pedicels. Perianth-segments pinkish, crisped, lanceolate,  $\frac{1}{2}$  in. long. Stamens exerted; filaments free to the base. Style as long as the stamens, clavate-triquetrous in the lower half.

Hab. Southern provinces of Cape Colony. Known to me only from Jacquin's figure and description.

## Tribe 3.—PANCRATIÆ.

## 34. EUCROSIA Ker.

*Perianth* funnel-shaped; tube short, campanulate; segments equal, oblanceolate. *Stamens* much exserted, declinate, inserted at the throat of the perianth-tube; filaments filiform, irregularly united and callose internally at the base; anthers oblong, versatile. *Ovary* globose, 3-celled; ovules numerous; style filiform, declinate; stigma punctiform. *Capsule* deeply 3-lobed. *Seeds* many, angled by pressure.—Differs from *Callipsyche* only by its filaments connate towards the base.

1. *E. BICOLOR* Ker in Bot. Reg. t. 207; Hook. Exot. Flora, t. 209; Herb. in Bot. Mag. t. 2490. — Bulb ovoid, 1 in. diam.; tunics brown, membranous. Leaves several, petioled, contemporary with the flowers; blade thin, lanceolate,  $\frac{1}{2}$  ft. long, 1–2 in. broad. Peduncle very slender, a foot long. Flowers about 4 in an umbel; pedicels  $\frac{1}{2}$ – $1\frac{1}{2}$  in. long; spathe-valves about 4, linear. Perianth-limb an inch long; tube  $\frac{1}{6}$  in. long and broad; segments  $\frac{1}{4}$  in. broad, reddish yellow, with a laxly 3–5-nerved green keel. *Stamens* much exserted, and style still longer.

Hab. Andes of Ecuador, *Jameson!* *Seemann!* Introduced into cultivation by Lee and Kennedy in 1817.

## 35. STRICKLANDIA Baker.

*Perianth* narrowly funnel-shaped; tube short; segments oblanceolate, equal, spreading only at the tip. *Stamens* not declinate, inserted at the throat of the tube, a little longer than the segments; filaments callose at the base, united halfway up in a cup, lanceolate above it, without any teeth between; anthers linear-oblong, versatile. *Ovary* globose, 3-lobed, 3-celled; ovules many in a cell, superposed; style filiform; stigma punctiform. *Capsule* short, deeply 3-lobed, loculicidally 3-valved. *Seeds* many, small.—Differs from *Eucrosia* by its shorter straight stamens, like those of *Stenomesson*.

1. *S. EUCROSIODES* Baker. *Leperiza eucrosioides* Baker in Gard. Chron. 1878, i. 170. *Stenomesson Stricklandi* Baker in Gard. Chron. 1882, ii. 102.—Bulb ovoid, 2 in. diam.; tunics brown, membranous. Leaves 2 to a stem, produced after the flowers; blade thin, green, oblong, 6–9 in. long; petiole shorter than the blade. Peduncle slender, terete, a foot long. Flowers 3–4 in an umbel, horizontal or cernuous; pedicels  $\frac{1}{2}$ –1 in. long; spathe-valves linear. Perianth-limb 1– $1\frac{1}{4}$  in. long; tube green,  $\frac{1}{6}$ – $\frac{1}{4}$  in. long; segments  $\frac{1}{8}$  in. broad, red, laxly nerved all through, not keeled nor tipped with green. *Stamens* finally just exserted. Style exserted  $\frac{1}{4}$  in.

Hab. Andes of Ecuador. Received alive in the summer of 1882–3 from Sir C. W. Strickland, who pointed out at the time its systematic position; and also from Messrs. E. G. Henderson in 1877, and Dr. Wallace, of Colchester, in 1879. From *Phadranassa*, under which Mr. Bentham has placed it in 'Genera Plantarum,' it differs by its monadelphous filaments.

36. CALLIPSYCHE *Herb.*

*Perianth* funnel-shaped; tube short; segments equal, oblanceolate-oblong, laxly nerved down the keel. *Stamens* much exserted, declinate, inserted at the throat of the perianth-tube, callose at the base, not united; filaments filiform; anthers oblong, versatile. *Ovary* deeply laterally 3-lobed; ovules very numerous, superposed; style very long, declinate; stigma punctiform. *Capsule* deeply laterally 3-lobed. *Seeds* crowded, angled by pressure. — *Rootstock* a tunicated bulb. *Leaves* thin, oblong, petioled. *Peduncle* hollow. *Flowers* many in an umbel; spathe-valves ovate-lanceolate.

1. *C. EUCROSIODES* Herb. in Bot. Reg. 1845, t. 45. — Bulb globose, 2 in. diam. Leaves produced after the flowers, petioled, oblong; blade a foot long, about 4 in. broad. *Peduncle* slender, above 2 ft. long. *Flowers* 8–10 in an umbel; pedicels an inch long; outer spathe-valves lanceolate, reflexing. *Perianth-limb* 1–1½ in. long; segments oblanceolate-oblong, obtuse, greenish yellow, three times as long as the tube. *Stamens* and style exserted 3 in. beyond the tip of the segments.

*Hab.* Guayaquil, *Sinclair!* Given by Herbert as a plant of the West Coast of Mexico, but this is probably a mistake. Introduced in 1844, but I have never seen it alive.

2. *C. MIRABILIS* Baker in Saund. Ref. Bot. t. 168. — Bulb oblong, 2 in. diam.; outer tunics brown, membranous. Leaves 1–2, produced after the flowers; petiole finally a foot long; blade oblong, acute, thin, a foot long, 5–6 in. broad. *Peduncle* hollow, 2–3 ft. long. *Flowers* about 30, forming a dense umbel 8–9 in. diam.; pedicels 1–1½ in. long; outer spathe-valves 2, ovate-lanceolate, reflexing. *Perianth-limb* ⅝–¾ in. long; segments greenish yellow, twice as long as the campanulate tube. *Stamens* and style declinate, protruded 3 in. or more from the perianth.

*Hab.* Andes of Peru. Described first from a plant flowered by Mr. Wilson Saunders at Reigate about 1870, received from Linden. (Since received alive from Sir C. W. Strickland and Messrs. Sander and Horsman. *Flowers* in July and August.

3. *C. AURANTIACA* Baker in Saund. Ref. Bot. t. 167; Bot. Mag. t. 6141. — Bulb ovoid, 1 in. diam.; tunics membranous, brown. Leaves oblong, petioled, developed after the flowers; blade membranous, cordate-oblong, ½ ft. long, 4 in. broad. *Peduncle* subterete, 1½–2 ft. long. *Flowers* 6–8 in an umbel; pedicels ½–1 in. long; outer spathe-valves lanceolate, inner linear. *Perianth-limb* 1½–2 in. long; tube short, greenish; segments bright yellow, ⅓–½ in. broad. *Stamens* exserted, 2½–3 in. beyond the tip of the segments; anthers small, oblong.

*Hab.* Andes of Ecuador, alt. 8000 ft., *André* 4262! First described from a plant flowered by Mr. Wilson Saunders in 1869, received from Linden. I have had it since from Sir C. W. Strickland and Messrs. Bull and Horsman. *Flowers* in February; leaf not fully developed till June.

## 37. PHÆDRANASSA Herb.

*Perianth* subcylindrical; tube short or long; segments equal, regular, spreading only at the tip. *Stamens* inserted at or below the throat of the perianth-tube; filaments straight, filiform, not distinctly appendiculate; anthers oblong, versatile. *Ovary* globose-trigonous, 3-celled; ovules many, superposed; style filiform; stigma capitate. *Capsule* globose, loculicidally 3-valved. *Seeds* many, small, black.—*Rootstock* a tunicated bulb. *Leaves* petioled, oblong or lanceolate, produced after the flowers. *Flowers* bright-coloured, few or many in an umbel, usually tipped with green; outer spathe-valves lanceolate.

Perianth-tube much shorter than the segments . Sp. 1-4.

Perianth-tube much longer than the segments . Sp. 5.

1. *P. CHLORACEA* Herb. in Bot. Reg. 1845, t. 17. *P. obtusa* Herb.; Regel, Gartenfl. t. 413. *P. multiflora* Kunth. *Hæmanthus dubius* H. B. K. *Crinum quitense* Spreng. *Phycella chloracea* Herb. *P. obtusa* Lindl.—Bulb globose, 2-3 in. diam. Leaves produced after the flowers; blade oblong-lanceolate, acute, 8-12 in. long, 2-3 in. broad at the middle; petiole  $\frac{1}{2}$  ft. long, clasping the stem towards the base. Peduncle glaucous, subterete, 2-3 ft. long. Flowers 6-12 in an umbel; pedicels 1-2 in. long; outer spathe-valves acuminate, reflexing. Flowers generally drooping; perianth-limb  $1\frac{1}{2}$ -2 in. long; tube subcylindrical,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long; segments lanceolate, acute, scarlet, tipped with green. Stamens as long as the perianth-segments. Style finally much exerted.

Hab. Andes of Ecuador. ascending to 12,000 ft., *Hartweg!* *Spruce!* *Jameson!* Often seen in cultivation. *P. obtusa*, *chloracea*, and *multiflora* differ only in the number and size of the flowers. Flowers in summer. On re-examination I fear that *P. ventricosa* Baker in Engler Jahrb. 1887, 210, founded on Lehmann's 2157, from Columbia, is also a form of this species.

2. *P. VIRIDIFLORA* Baker in Gard. Chron. 1877, ii. 134. — Bulb ovoid,  $1\frac{1}{2}$  in. diam.; outer tunics thin, brown. Leaf single; blade bright green, lanceolate, nearly a foot long,  $1\frac{1}{2}$ -2 in. broad at the middle; petiole short. Peduncle terete, a foot long. Flowers about 4 in an umbel, drooping; pedicels  $\frac{1}{2}$ - $\frac{3}{4}$  in. long; outer spathe-valves lanceolate. Perianth-limb  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. long; tube short, greenish yellow; segments oblanceolate-spathulate, green towards the tip, without any red, passing into whitish towards the base. Stamens as long as the segments. Style much exerted.

Hab. Andes of Ecuador. Described from living specimens sent by Mr. H. J. Elwes in June, 1877, and Mr. Wilson Saunders. Perhaps a colour-variety of *P. chloracea*.

3. *P. LEHMANNI* Regel, Gartenfl. xxxii. 354, t. 1138. — Bulb ovoid, 2 in. diam. Leaf oblong-lanceolate, bright green, 6-8 in. long, 2 in. broad at the middle; petiole shorter than the blade. Peduncle rather compressed. Flowers 3-4 in an umbel; pedicels  $1-1\frac{1}{2}$  in. long; spathe-valves lanceolate, reflexing. Perianth-limb  $1\frac{1}{4}$  in. long; tube green, campanulate; segments oblanceolate, bright red, not tipped with green. Stamens exerted about  $\frac{1}{2}$  in. Style  $\frac{1}{4}$  in. longer than the stamens.

Hab. Western slope of the Andes of Columbia, alt. 7000 ft., *Lehmann*. Introduced into cultivation in 1883.

4. *P. SCHIZANTHA* Baker in Gard. Chron. 1880, ii. 556. — Bulb ovoid, 1 in. diam. Leaf contemporary with the flower in October, oblong-lanceolate, acute, bright green, 6–8 in. long, 2 in. broad at the middle; petiole short. Peduncle slender, nearly a foot long. Flowers about 5 in an umbel; pedicels  $\frac{1}{2}$ –1 in. long; outer spathe-valves lanceolate. Perianth-limb  $1\frac{1}{2}$  in. long; tube campanulate, green,  $\frac{1}{6}$  in. long; segments lanceolate, bright red, with a salmon-coloured obtuse tip  $\frac{1}{4}$  in. broad. Stamens exerted  $\frac{1}{4}$  in. Style  $\frac{1}{4}$  in. longer than the stamens.

Hab. Andes of Ecuador; Pasto, alt. 10,000 ft., *André*! Discovered in 1876. Described from a living specimen flowered by M. André in October, 1880.

5. *P. CARMOLI* Baker in Saund. Ref. Bot. t. 46. — Bulb globose, 2–3 in. diam., with brown tunics and a short neck. Leaves 1–2, as long as the peduncle; blade oblong-lanceolate, acute, bright green, a foot long, 3 in. broad at the middle; petiole much shorter than the blade. Peduncle terete, pale glaucous-green, 2 ft. long. Flowers 8–10 in an umbel; pedicels an inch long; spathe-valves lanceolate. Perianth-limb 2 in. long; tube bright red, cylindrical, three times as long as the oblong-lanceolate connivent segments, which are green with a pale edge. Stamens exerted, inserted below the throat of the perianth-tube. Style not reaching the tip of the stamens.

Hab. Costa Rica, *Carmiol*! Described from a plant flowered by Mr. Wilson Saunders in 1867.

### 38. URCEOLINA *Reich*.

*Perianth*-tube cylindrical, suddenly dilated; segments equal, oblong or ovate, spreading only at the tip. *Stamens* inserted at or below the throat of the tube; filaments filiform, indistinctly appendiculate at the base; anthers oblong, versatile. *Ovary* deeply 3-lobed, 3-celled; ovules many, superposed; style filiform; stigma capitate. *Capsule* deeply lobed, loculicidally 3-valved. *Seeds* many, small. — *Rootstock* a tunicated bulb. *Leaves* thin, petioled, oblong or lanceolate. *Flowers* yellow or red, many in an umbel, pendulous.

Flowers yellow, tipped with green; segments long	Sp. 1–2.
Flowers bright red, not tipped with green; segments short	Sp. 3.

1. *U. PENDULA* Herb. Amaryll. 193; Bot. Mag. t. 5464. *U. aurea* Lindl. *Crinum urceolatum* Ruiz et Pavon, Fl. Peru, iii. 58, t. 287B. *Collania urceolata* Schult. — Bulb globose,  $1\frac{1}{2}$  in. diam. Leaves 1–2 to a stem, produced after the flowers; blade thin, oblong, acute, a foot or more long, 4–5 in. broad; petiole much shorter. Peduncle terete, a foot long. Flowers pendulous, bright yellow, tipped with green, 4–6 in an umbel; pedicels slender, 1–2 in. long; outer spathe-valves large, lanceolate. Perianth-tube an inch long, dilated suddenly in the upper third; segments oblong-

lanceolate,  $1\frac{1}{2}$  in. long, spreading only at the tip. Stamens as long as the perianth-limb. Style shortly exerted.

Var. U. FULVA Herb. Amaryll. 55. — Leaves shorter, more rounded at the base. Flowers much smaller (limb an inch long).

Hab. Andes of Peru. Described from a plant that flowered at Kew, Nov., 1877, and 1887. Var. *fulva*, *Matthews* 868!

2. U. LATIFOLIA Benth. Gen. Plant. iii. 732. *Pancratium latifolium* Ruiz et Pavon, Fl. Peruv. iii. 54, t. 384. *Leperiza latifolia* Herb.; Bot. Mag. t. 4952. *Chrysiphiala latifolia* Lindl. — Bulb ovoid, 2 in. diam., with brown tunics and a short neck. Leaves 2-4 to a stem; blade oblong, a span long, 4-5 in. broad; petiole much shorter. Peduncle stout, terete, a foot long. Flowers 6-8 in an umbel, pendulous, bright yellow, tipped with green; pedicels slender, 1-2 in. long; spathe-valves lanceolate. Perianth-tube under an inch long, dilated suddenly into a funnel in the upper third; segments oblong-lanceolate, an inch long, spreading only at the tip. Stamens slightly exerted. Style overtopping the anthers.

Hab. Andes of Peru. Described from a plant that flowered in Sept. 1856, at Kew, from bulbs sent by Mr. Maclean, of Lima,

3. U. MINIATA Benth. Gen. Plant. iii. 732. *Pentlandia miniata* Herb. in Bot. Reg. 1839, t. 68. *Spharotele coccinea* Link, Otto & Klotzsch Ic. t. 38. *S. miniata* Klotzsch. — Bulb ovoid, 1- $1\frac{1}{2}$  in. diam.; tunics brown. Leaves produced after the flowers, shortly petioled, a foot long, 1- $1\frac{1}{2}$  in. broad at the middle, narrowed gradually to the base and apex. Peduncle slender, 1- $1\frac{1}{2}$  ft. long. Flowers 2-6 in an umbel, pendulous, bright scarlet, not tipped with green; pedicels 1- $1\frac{1}{2}$  in. long; spathe-valves 2, lanceolate. Perianth-limb  $1\frac{1}{2}$  in. long; tube cylindrical in the lower half, urceolate in the upper half; segments oblong, spreading only at the tip. Stamens inserted below the throat of the tube; anthers sometimes exerted. Style very slender, much exerted.

Hab. Andes of Peru and Bolivia, ascending to 10,000 ft., *Matthews!* *Maclean!* *Pearce!* *Roezl!* Described from a plant that flowered at Kew, Feb., 1877. Also received alive from Mr. Elwes, Colonel Trevor Clarke, Dr. Wallace, Messrs. Veitch, &c. Very like *Stenomesson croceum* in the perianth; differs in stamens and leaf.

### 39. EUCHARIS *Planchon.*

Perianth-tube cylindrical, with a dilated throat, more or less curved; segments oblong, equal, spreading. Stamens inserted at the throat of the perianth-tube, shorter than the segments; filaments variously appendiculate downwards; anthers versatile. Ovary globose, 3-celled; ovules many, rarely 2, superposed; style filiform; stigma capitate, 3-lobed. Fruit deeply 3-lobed, finally dehiscent. Seeds large, bulbiform, sometimes solitary. — Rootstock a tunicated bulb. Leaves petioled, oblong, bright green. Flowers few in an umbel, large, pure white; outer spathe-valves 2, ovate-lanceolate; inner many, linear.

Quadrate appendage of filaments distinctly protruded from the perianth-tube.

Ovules many in a cell . . . . . Sp. 1-2.

Ovules 2 in a cell . . . . . Sp. 3.

Appendage of filaments almost entirely adnate to the perianth-tube.

Perianth-segments large, spreading . . . . . Sp. 4.

Perianth-segments small, ascending . . . . . Sp. 5.

1. *E. GRANDIFLORA* Planch. in *Flore des Serres*, t. 957; *Bot. Mag.* t. 4971. *E. amazonica* Hort. Linden; *Flore des Serres*, t. 1216-1217. — Bulb globose, 2 in. diam. Leaves 2-4 to a stem; petiole about a foot long, semicircular on the back; blade oblong, bright green, a foot or more long, 5-6 in. broad. Peduncle terete,  $1\frac{1}{2}$ -2 ft. long. Flowers 4-6 in an umbel; pedicels  $\frac{1}{2}$ -1 in. long; outer spathe-valves ovate-lanceolate; ovules about 20 in a cell. Perianth tube curved, cylindrical, 2 in. long, dilated in the upper third to a throat  $\frac{1}{2}$  in. diam.; segments oblong, obtuse, spreading,  $1\frac{1}{2}$ -2 in. long in the cultivated plant. Staminal cup of six quadrate connate segments  $\frac{1}{2}$  in. long, with a short filament lanceolate at the base from the centre of each. Style overtopping the anthers.

Hab. Andes of New Granada, *Lobb! Jameson! Lehmann! André!* Introduced into cultivation in 1854 by M. Triana through M. Linden. The imperfectly-described *Hymenocallis Bonplandii* Kunth, Enum. v. 666, gathered by Bonpland on the banks of the Rio Magdalena, is probably a *Eucharis*.

2. *E. MASTERSII* Baker in *Bot. Mag.* t. 6831. — Bulb globose,  $1\frac{1}{2}$ -2 in. diam. Leaf-blade oblong, bright green, rounded at the base, 8-9 in. long, 4-5 in. broad; petiole shorter than the blade. Peduncle terete, a foot long. Flowers 2 in an umbel, nearly sessile; outer spathe-valves lanceolate. Ovules many in a cell. Perianth-tube slightly curved, 2 in. long, dilated in the upper third to a throat  $\frac{1}{2}$  in. diam.; segments ovate, spreading, above an inch long. Corona adnate to the tube, except a narrow free border, the connate edge distinctly toothed between the filaments; stipes yellowish green. Style reaching to the tip of the perianth-segments; stigma distinctly 3-lobed. Expanded limb  $2\frac{1}{2}$ -3 in. diam.

Hab. Andes of New Granada. Described from specimens sent by Messrs. Sander & Co., of St. Albans, in Feb. 1885.

3. *E. CANDIDA* Planch. in *Flore des Serres* t. 788. — Bulb globose, stoloniferous, 2 in. diam. Leaf-blade bright green, oblong, 9-15 in. long, 4-5 in. broad at the middle, narrowed gradually to the base and acute apex; petiole nearly or quite as long as the blade, rounded on the back. Peduncle subcompressed, glaucous, above a foot long. Flowers 6-10 in a centripetal umbel; pedicels  $\frac{1}{2}$ - $\frac{3}{4}$  in. long; outer spathe-valves lanceolate. Ovary globose, deeply lobed; ovules 2 in a cell. Perianth-tube curved,  $1\frac{1}{2}$ -2 in. long, dilated in the upper third to a throat  $\frac{1}{2}$  in. diam.; segments oblong, 1- $1\frac{1}{2}$  in. long. Filaments with quadrate appendages  $\frac{1}{3}$ - $\frac{1}{2}$  in. long, united at the base only; free part of the filament lanceolate,  $\frac{1}{4}$  in. long. Style not reaching to the tip of the segments; stigma small, entire.

Hab. Andes of New Granada, *Schlim! Goudot!* Described from a plant flowered at Kew in March, 1877, presented by Mr. Wm. Bull.

4. *E. SANDERI* Baker in Bot. Mag. t. 6676.—Bulb ovoid,  $1\frac{1}{2}$ –2 in. diam.; outer tunics brown. Leaf-blade bright green, oblong, 10–12 in. long, 5–6 in. broad, cordate at the base; petiole half as long as the blade. Peduncle terete, a foot long. Flowers 2–3 in an umbel, nearly sessile; outer spathe-valves lanceolate. Ovules about 20 in a cell. Perianth-tube curved, 2 in. long, dilated in the upper third to a throat  $\frac{1}{2}$  in. diam.; segments ovate, pure white, above an inch long. Corona with a very narrow free collar-like edge; stripes primrose-yellow; free filaments  $\frac{1}{3}$  in. long. Style reaching to the tip of the perianth-segments; stigma distinctly 3-lobed.

Var. *MULTIFLORA* Baker in Bot. Mag. t. 6831.—Flowers smaller, 4–6 in an umbel, striped with green.

Hab. New Granada, on the banks of the Rio Dagua and Rio Telembi, *Lehmann* 2736! First described from a living plant sent by Messrs. Sander & Co. in March, 1882.

5. *E. SUBEDENTATA* Benth. in Gen. Plant. iii. 731. *Calliphruria subedentata* Baker in Bot. Mag. t. 6289; N. E. Brown in Ill. Hort. n. s. t. 415.—Bulb ovoid,  $1\frac{1}{2}$  in. diam.; tunics brown, membranous. Leaves about 4 to a bulb, contemporary with the flowers; blade oblong, acute, bright green, deltoid at the base, 6–8 in. long, 3–4 in. broad; petiole as long as the blade, channelled down the face. Peduncle slender, a foot long. Flowers 6–8 in an umbel; pedicels  $\frac{1}{2}$ –1 in. long; spathe-valves lanceolate. Ovary globose; ovules 6–8 in a cell. Perianth-tube an inch long, funnel-shaped in the upper half; segments oblong, ascending,  $\frac{1}{2}$  in. long. Stamens half as long as the segments; filaments lanceolate, occasionally toothed at the base; anthers linear-oblong. Style as long as the segments. Stigma 3-lobed.

Hab. Andes of New Granada, *Lehmann* 3374! First described from a plant sent by M. H. Beaufoy, Esq., in Dec. 1876. Since received from Messrs. T. Moore, Veitch, Bull, Linden, &c.

#### 40. PLAGIOLIRION *Baker.*

*Perianth-tube* short, cylindrical; limb oblique, the two lower segments spreading horizontally; segments oblanceolate, equal, twice as long as the tube. *Stamens* inserted at the throat of the perianth-tube, shorter than the segments; filaments united at the base in a cup, with a tooth between each of them; anthers oblong, versatile. *Ovary* globose, 3-celled; ovules 2–3 in a cell, superposed; style filiform; stigma capitate. *Capsule* globose, finally dehiscing. *Seeds* not more than one in a cell, globose.—Allied to *Eucharis* and *Calliphruria*.

1. *P. HORSMANNI* Baker in Gard. Chron. 1883, ii. 38. — Bulb globose,  $1\frac{1}{2}$  in. diam., with a short neck and brown membranous tunics. Leaves developed after the flowers; blade thin, oblong, acute, 8–9 in. long, 3–4 in. broad; petiole shorter than the blade. Peduncle 4–6 in. long. Flowers 8–10 in an umbel; pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; outer spathe-valves lanceolate. Perianth-tube green,  $\frac{1}{4}$  in. long; segments white, laxly 5-nerved in the central half. Stamens

half as long as the segments; filaments narrowly winged up to the tip.

Hab. Andes of New Granada. Described from living plants flowered by Mr. F. Horsman, of Colchester, in July, 1883, and Mr. Wm. Bull in May, 1884.

#### 41. CALLIPHURIA Herb.

*Perianth*-tube funnel-shaped, dilated gradually from the base to the throat; segments equal, oblong, spreading, as long as the tube. *Stamens* inserted at the throat of the perianth-tube; filaments short, petaloid, with a large lanceolate tooth on each side of the linear-oblong versatile anther. *Ovary* globose, 3-celled; ovules 2-3 in a cell; style long, filiform, distinctly tricuspidate at the apex. *Capsule* finally dehiscing. *Seeds* globose, not more than one in a cell. — *Rootstock* a tunicated bulb. *Leaves* oblong, petioled. *Flowers* white, many in an umbel. Nearly allied to *Eucharis*.

1. *C. HARTWEGIANA* Herb. in Bot. Reg. 1844, Misc. No. 87; Baker in Bot. Mag. t. 6259. — Bulb ovoid, an inch in diam., copiously stoloniferous; tunics brown, membranous. Leaves bright green, firmer in texture and more closely veined than in *Eucharis*; blade oblong, acute, 4-5 in. long, 2 in. broad, cuneate at the base; petiole shorter than the blade. Peduncle slender, a foot long. Flowers 6-8 in an umbel; pedicels short; outer spathe-valves lanceolate. Perianth an inch long; tube funnel-shaped from the base; throat  $\frac{1}{4}$  in. diam. Anthers  $\frac{1}{4}$  in. long. Style finally protruded beyond the tip of the segments.

Hab. Andes of Bogota. First gathered by Hartweg in 1842. Described from living plants flowered by Mr. Wm. Bull in July, 1874, and at Kew in November, 1877.

2. *C. TENERA* Baker. — Bulb globose,  $\frac{3}{4}$  in. diam. Leaves not seen. Peduncle very slender,  $\frac{1}{2}$  ft. long. Flowers 6-8 in an umbel; pedicels very slender, longer than in *C. Hartwegiana*. Perianth  $\frac{3}{4}$  in. long; tube subcylindrical in the lower half; segments  $\frac{1}{8}$  in. broad, as long as the tube, very thin in texture. Anthers  $\frac{1}{8}$  in. long. Capsule  $\frac{1}{8}$  in. diam., depresso-globose.

Hab. Andes of New Granada, Goudot!

#### 42. EUSTEPHIA Cav.

*Perianth* regular, subcylindrical; tube short, campanulate; segments equal, ascending, oblanceolate, obtuse. *Stamens* inserted at the throat of the perianth-tube, as long as the segments; filaments free, petaloid in the lower half, toothed on each side at its apex; anthers linear-oblong, versatile. *Ovary* 3-celled; ovules many, superposed; style exerted; stigma capitate. *Fruit* and *seeds* unknown.

1. *E. COCCINEA* Cav. Ic. iii. 20, t. 238. *E. Macleanica* Herb. *Phadranassa (Odontopus) rubro-viridis* Baker. — Bulb ovoid, 1 in. diam., with a cylindrical neck. Leaves 3-4, developed after the flowers, linear, bright green, a foot or more long. Peduncle slender,

ancipitous, a foot long. Flowers 6-8 in an umbel, horizontal or drooping; pedicels  $\frac{3}{4}$ -1 in. long; outer spathe-valves lanceolate. Perianth  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. long above the ovary; segments bright red, tipped with green.

Hab. Andes of Peru, *Maclean!* Received alive from Col. Trevor Clarke, Sir C. W. Strickland, and Messrs. Green and Henderson. Flowers in spring.

#### 42. STENOMESSION *Herb.*

*Perianth-tube* long, funnel-shaped; segments short, equal, oblong, ascending. *Stamens* inserted at the throat of the perianth-tube; filaments united towards the base in a distinct cup, which is often toothed between them; anthers oblong, versatile. *Ovary* 3-celled; ovules many, superposed; style erect, filiform; stigma capitate. *Capsule* loculicidally 3-valved. *Seeds* small, crowded, black.—*Rootstock* a tunicated bulb. *Leaves* linear, lorate or lanceolate. *Flowers* few or many in an umbel, generally red or yellow, tipped with green.

STENOMESSION PROPER. Filaments inserted at the edge of the staminal cup. Habit less robust; flowers smaller.

Flowers plain yellow . . . . .	Sp. 1-4.
Flowers variegated yellow and red . . . . .	Sp. 5-6.
Flowers plain red . . . . .	Sp. 7-8.

COBURGIA. Filaments inserted at the edge of the staminal cup. Habit more robust; flowers larger, yellow or red, tipped green . . . . . Sp. 9-10.

CALLITHAUMA. Filaments inserted below the edge of the staminal cup. Flowers green . . . . . Sp. 11.

1. *S. AURANTIACUM* Herb. App. 40. *Pancreatium aurantiacum* H. B. K. *Chrysiphiala aurantiaca* Roem. et Schultes. *S. Hartwegii* Lindl. in Bot. Reg. 1844, t. 42. *S. eustephioides* Herb. — Bulb globose, 1 in. diam., with brown tunics and a short neck. Leaves linear, usually produced after the flowers. Peduncle slender, 1- $1\frac{1}{2}$  ft. long. Flowers 3-6 in an umbel, horizontal or ascending; pedicels 1- $1\frac{1}{2}$  in. long; outer spathe-valves lanceolate. Perianth bright orange,  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. long; tube funnel-shaped in the upper half; segments oblong-cuspidate, half as long as the tube. Stamens nearly as long as the segments; filaments dilated, united in a cup in the lower half, without any tooth between. Style protruded beyond the tip of the segments.

Hab. Andes of Ecuador, ascending to 13,000 ft., *Jameson! Hall! Hartweg! André!* Received alive lately from Messrs. E. G. Henderson and Anderson Henry. Flowers in summer.

2. *S. PEARCEI* Baker in Saund. Ref. Bot. t. 308. — Bulb ovoid, 2 in. diam., with brown tunics and a long neck. Leaves produced after the flowers, lanceolate, bright green, above a foot long, above an inch broad at the middle. Peduncle 2-3 ft. long, subglaucous, slightly compressed. Flowers 6-8 in an umbel; pedicels slender, 2-4 in. long; outer spathe-valves oblong-lanceolate,  $1\frac{1}{2}$ -2 in. long.

Perianth-limb  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long; tube tinged with green, funnel-shaped in the upper half; segments oblong, pale yellow,  $\frac{1}{2}$  in. long. Stamens as long as the segments; filaments united in the lower half in a cup, with a bifid tooth between each of them. Style reaching to the tip of the segments.

Hab. Andes of Peru, *Lechler* 2138! Andes of Bolivia, alt. 10,000 ft., *Mandon* 1198! Described from a living plant flowered by Messrs. Veitch in 1871, the bulbs of which were sent home by their collector, Pearce.

3. *S. CROCEUM* Herb. Amaryll. 199. *Pancratium croceum* Savigny; Red. Lil. t. 187. *S. Ruizianum* Kunth. *Pancratium flavum* Ruiz et Pavon, Fl. Peruv. iii. 54, t. 284a. — Bulb globose, 1 in. diam. Leaves linear, a foot long,  $\frac{1}{4}$  in. broad. Peduncle slender, a foot long. Flowers 4–6 in an umbel; pedicels  $\frac{1}{2}$ – $1\frac{1}{4}$  in. long; spathe-valves lanceolate. Perianth-limb  $1\frac{1}{2}$ –2 in. long; tube slender in the lower half, cylindrical in the upper, suddenly dilated at the middle, pale yellow; segments oblong,  $\frac{1}{2}$  in. long. Stamens as long as or a little longer than the segments; cup not distinctly toothed at the edge between the filaments.

Hab. Andes of Peru, *Pavon*! *Dombey*! Described from specimens in the Smithian Herbarium and at the British Museum, and a living plant that flowered at Kew in May, 1877.

4. *S. FLAVUM* Herb. in Bot. Mag. t. 2641. *Chrysiphiala flava* Gawl. in Bot. Reg. t. 978.—Bulb subglobose, 1 in. diam. Leaves oblanceolate, a foot long, an inch broad, obscurely petioled. Peduncle slender, a foot long. Flowers 4–6 in an umbel; pedicels slender, an inch long; spathe-valves lanceolate. Perianth-limb bright yellow,  $1\frac{1}{2}$ –2 in. long; tube dilated at the middle, cylindrical in the upper half; segments oblong,  $\frac{1}{2}$  in. long. Stamens just exerted; staminal cup not distinctly toothed between the filaments. Style overtopping the anthers.

Var. *S. LATIFOLIUM* Herb. in Bot. Mag. t. 3803. *S. vitellinum* Lindl. in Bot. Reg. 1843, t. 2.—Edge of the staminal cup with an entire tooth between each filament.

Var. *S. CURVIDENTATUM* Herb. in Bot. Mag. t. 2640. *S. pauciflorum* Herb. *Chrysiphiala pauciflora* Lindl.; Hook. Exot. Flora, t. 132.—Edge of the staminal cup with a bifid tooth between each of the filaments.

Hab. Andes of Peru. Introduced into cultivation by Cowan in 1824. Very likely more than one species is here included, but I have not seen any of the forms alive.

5. *S. HUMILE* Baker in Saund. Ref. Bot. sub t. 308. *Coburgia humilis* Herb. in Bot. Reg. 1842, t. 46. *Clitanthes humilis* Herb.—Bulb ovoid, under 1 in. diam., with brown tunics and a short neck. Leaves linear, bright green, a foot long, developed after the flower. Peduncle very short, bearing one erect flower, with erect membranous spathe-valves, connate in the lower half. Perianth orange-red,  $2\frac{1}{2}$  in. long; throat of the tube  $\frac{1}{8}$  in. diam.; segments oblong,  $\frac{1}{2}$  in. long. Stamens shorter than the segments, united in the lower half in a cup, which is not toothed at the edge. Style finally exerted.

Hab. Andes of Peru; Palcamayo, alt. 10,000 ft., *Maclean*! Cuzco, 12,000 ft., *Pearce*! Perhaps only a high mountain form of *S. recurvatum*.

6. *S. RECURVATUM* Baker in Saund. Ref. Bot. sub t. 308. *Pancratium recurvatum* Ruiz et Pavon, Fl. Peruv. t. 285a. *Coburgia recurvata* Herb. *Carpodotes recurvatus* Herb. *Chrysothiala recurvata* Lindl.—Bulb ovoid, 1–1½ in. diam. Leaves 3–6, linear, a foot long, ¼–⅓ in. broad, contemporary with the flowers. Peduncle slender, 1–1½ ft. long. Flowers 2–6 in an umbel; pedicels 1–3 in. long; spathe-valves large, lanceolate. Perianth-limb 2–2½ in. long, reddish yellow; tube ⅓ in. diam. at the throat; segments oblong, ½–⅝ in. long. Stamens shorter than the segments; filaments united in a cup obscurely toothed between them. Style finally exerted ¼ in. beyond the tip of the segments.

Hab. Andes of Peru, Bolivia, and Northern Chili, *Pavon!* (British Museum) *Maclean!* Of Herbert's species I cannot distinguish from this *Coburgia discolor*, *obragillensis*, *angusta*, *lutea*, and *Macleanica*. It was first noticed by Feuillé, under the name of *Lilioneissus bicolor*.

7. *S. COCCINEUM* Herb. App. 40; Baker in Ref. Bot. t. 309. *S. rubrum* Herb. *Pancratium coccineum* Ruiz et Pavon, Fl. Peruv. t. 285b. *Coburgia coccinea* Herb. in Bot. Mag. t. 3865. *C. praecipitata* and *remusa* Herb.—Bulb ovoid, 1½ in. diam. Leaves 4–5, linear, developed after the flowers, bright green, channelled down the face, a foot long, ⅓–½ in. broad. Peduncle slender, terete, subglaucous, 1–1½ ft. long. Flowers 4–8 in an umbel; pedicels 1–1½ in. long; spathe-valves lanceolate. Perianth-limb bright red, 1¼–1½ in. long; tube ⅓ in. diam. at the throat; segments oblong, half as long as the tube. Stamens as long as the segments; filaments united in the lower half in a cup with a distinct tooth between each of them. Style finally protruded ¼–⅓ in. beyond the tip of the segments.

Var. *S. BREVIFLORUM* Herb.—Perianth paler red, 1–1¼ in. long. Leaf lanceolate, indistinctly petioled.

Hab. Andes of Peru, ascending to 10,000 ft., *Pavon!* *Mathews!* *Pearce!* Var. *breviflorum*; *Maclean!*

8. *S. SUSPENSUM* Baker in Saund. Ref. Bot. t. 22.—Bulb ovoid, 1–1½ in. diam., with brown tunics and a short neck. Leaves 2–3, produced after the flowers, linear or lanceolate, a foot long. Peduncle slender, a foot long. Flowers 4–6 in an umbel, drooping; pedicels 1–1½ in. long; spathe-valves lanceolate. Perianth-limb bright scarlet, 1–1¼ in. long; tube funnel-shaped in the upper half; segments oblong, half as long as the tube. Stamens as long as the segments; filaments united in a cup in the lower half; free portion lanceolate at the base, without any tooth between; anthers small, oblong. Style finally exerted beyond the segments.

Hab. Andes of Peru. Described from a plant flowered in 1868 by Mr. Wilson Saunders, the bulbs of which were gathered by Fraser. Received also alive from Messrs. Veitch and Henderson.

9. *S. INCARNATUM* Baker in Saund. Ref. Bot. sub t. 308. *Pancratium incarnatum* H. B. K. *P. quitense* Willd. *Coburgia incarnata* Sweet, Brit. Flow. Gard. ser. 2, t. 17.—Bulb globose, 2–3 in. diam., with brown tunics and a long neck. Leaves 4–6, contemporary with the flowers, lorate, slightly glaucous, 1–1½ ft. long, about an inch broad. Peduncle stout, slightly 2-edged, hollow, 1½–2 ft. long,

Flowers 2-4 in an umbel; pedicels short; spathe-valves oblong, greenish, 2-3 in. long. Perianth-tube curved,  $2\frac{1}{2}$ -3 in. long, pale or bright red,  $\frac{1}{4}$  in. diam. at the throat; segments oblong, cuspidate,  $\frac{3}{4}$ -1 in. long, conspicuously keeled with green towards the tip. Stamens as long as the segments; filaments united towards the base, with a bifid process between each of them. Style sometimes, but not always, exerted beyond the tip of the segments.

Var. *S. ACUTUM* Baker, *l. c.* *Coburgia acuta* Herb. — Perianth-tube not more than  $\frac{1}{3}$  in. diam. at the throat; segments oblong-lanceolate.

Hab. Andes of Ecuador, Peru, and Bolivia, alt. 8000-10,000 ft. Not infrequent in cultivation. Of the species described by Herbert and Kunth, I look upon *C. splendens* (Ill. Hort. n. s. t. 285), *C. trichroma* (Bot. Mag. t. 3807), *C. variegata* (*Pancreatium variegatum* Ruiz et Pav.), *C. chacapoyensis*, *C. versicolor*, *C. fulva* (Bot. Mag. t. 3221), *C. lata*, and *C. langensis*, as mere forms, differing in the size and colouring of the flower.

10. *S. LUTEOVIRIDE* Baker in Bot. Mag. t. 6508. — Bulb globose, 3 in. diam., with brown tunics and a cylindrical neck half a foot long. Leaves 3-4 to a bulb, contemporary with the flowers, lorate, bright green, a foot long,  $1-1\frac{1}{4}$  in. broad. Peduncle above a foot long, stout, ancipitous. Flowers 5-6 in an umbel; pedicels not more than an inch long; spathe-valves oblong-lanceolate, greenish, 2-3 in. long. Perianth-tube curved, primrose-yellow,  $2-2\frac{1}{2}$  in. long,  $\frac{1}{3}$  in. diam. at the throat; segments oblong-cuspidate, yellow, with a green tip an inch long. Stamens as long as the segments; filaments united in the lower half, with a simple or obscurely-toothed deltoid process between each of them. Style exerted beyond the tip of the segments.

Hab. Andes of Ecuador. Described from a plant that flowered at Kew in the spring of 1879, and another in May, 1887.

11. *S. VIRIDIFLORUM* Benth. Gen. Plant. iii. 733. *Pancreatium viridiflorum* Ruiz et Pav. *Callithauma viridiflorum* Herb.; Bot. Mag. t. 3866 a. *Chrysiophiala viridiflora* Schultes. — Bulb ovoid,  $1\frac{1}{2}$ -2 in. diam., with brown tunics and a long cylindrical neck. Leaves linear, bright green,  $\frac{3}{4}$ -1 in. broad. Peduncle ancipitous,  $1\frac{1}{2}$ -2 ft. long. Flowers about 4 in an umbel; pedicels short; spathe-valves lanceolate, deciduous. Perianth entirely green; tube curved, 2 in. long,  $\frac{1}{8}-\frac{1}{4}$  in. diam. at the throat; segments oblong, acute,  $\frac{3}{4}$  in. long. Stamens as long as the perianth-segments; filaments inserted below the crenate edge of the cup, rather inflexed. Style not exerted beyond the tip of the segments.

Var. *C. ANGUSTIFOLIUM* Herb. in Bot. Mag. t. 3866 b. — Leaves narrower. Stamens shorter than the perianth-segments. Style exerted.

Var. *ELWESII* Baker in Gard. Chron. 1878, 756. — Staminal cup deeply 6-cleft, its lobes quadrate and emarginate.

Hab. Andes of Peru. The type and first variety were introduced into cultivation by Maclean in 1840, and flower in summer. The second variety I had from Mr. Elwes in 1876 and 1878. I know nothing of Herbert's *Callithauma spathulatum*, which is said to have oblong petioled thick coriaceous leaves, a peduncle 3 ft. long, and large green flowers.

## 44. HYLINE Herb.

*Perianth*-tube none; segments very long, linear, equal. *Stamens* attached to the base of the segments; filaments very long, united in a short cup at the base; anthers linear, versatile. *Ovary* clavate, 3-celled; ovules many, superposed; style filiform; stigma punctate. Immature *fruit* turbinate. *Seeds* unknown.—Habit of *Hymenocallis*, from which it differs by its numerous ovules and free perianth-segments.

1. H. GARDNERIANA Herb. in Bot. Mag. sub t. 3774. — Bulb ovoid, middle-sized. Leaves lorate, subacute, fleshy, glabrous, contemporary with the flowers in October, a foot long, an inch broad. Peduncle slender, above a foot long. Flowers 3-4 in an umbel; spathe-valves 2, ovate, membranous; pedicels  $\frac{3}{4}$ -1 in. long. Perianth-segments 5-6 in. long,  $\frac{1}{8}$  in. broad. Filaments nearly as long as the segments, united in a funnel-shaped tube  $\frac{1}{4}$  in. long; anthers  $\frac{1}{2}$  in. long.

Hab. Brazil; in dry woods at Ceara. Gathered by Gardner in Oct. 1838. "Bulb used as an emetico-purgative medicine in pectoral complaints."

## 45. PANCRATIUM Linn.

*Perianth*-tube elongated, cylindrical, dilated into a funnel at the top; segments linear or lanceolate, equal, spreading. *Stamens* inserted at the throat of the perianth-tube; filaments united in a conspicuous cup with an entire or bifid process between each of them; free portion short; anthers linear, versatile. *Ovary* 3-celled; ovules many in a cell, superposed; style long, filiform; stigma capitate. *Capsule* loculicidally 3-valved. *Seeds* black, angled by pressure.—*Rootstock* a tunicated bulb. *Leaves* sessile, linear or lorate. *Peduncle* solid. *Flowers* pure white, many or few in an umbel; pedicels generally short; outer spathe-valves 2, lanceolate.

Perianth-tube short.	Staminal cup small	. Sp. 1-3.
Perianth-tube short.	Staminal cup large	. Sp. 4-7.
Perianth-tube long.	Staminal cup large	. Sp. 8-12.

1. P. ILLYRICUM Linn. Sp. Pl. 418; Red. Lil. t. 153; Bot. Mag. t. 718 (Miller, Ic. t. 197). *P. stellare* Salisb. *Almyra* Salisb. *Halmyna stellaris* Parlat. — Bulb very large. Leaves 5-6, contemporary with the flowers, lorate, glaucous,  $1\frac{1}{2}$ -2 in. broad at the middle. Peduncle stout, compressed, a foot or more long. Flowers 6-12 in a centripetal umbel; outer spathe of one large ovate membranous valve; pedicels short, cernuous in fruit. Perianth-tube green, cylindrical, an inch long, dilated only at the very top; segments lanceolate, many-nerved,  $1\frac{1}{2}$  in. long,  $\frac{1}{4}$ - $\frac{1}{3}$  in. broad. Staminal cup obconic,  $\frac{1}{4}$ - $\frac{3}{8}$  in. long; teeth large, bifid; free portion of filament  $\frac{1}{2}$ - $\frac{3}{4}$  in. long; anthers linear-oblong,  $\frac{1}{8}$  in. long. Style reaching to the tip of the segments. Seeds not compressed; raphe white.

Hab. Corsica, Sardinia, Malta, and S. Italy. Flowers in summer. Figured by Besler, Seba, and Parkinson.

2. *P. TRIFLORUM* Roxb. Fl. Ind. ii. 126. *P. malabathricum* Herb. Amaryll. 202. *Catulli-pola* Rheede Malabar. xi. t. 40. — Bulb globose,  $1\frac{1}{2}$ –2 in. diam., without any neck. Leaves thin, lanceolate, acute, contemporary with the flowers, 8–12 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad at the middle. Peduncle slender, 6–9 in. long. Flowers 4–8 in an umbel; spathe-valve single, ovate, acute; pedicels very short. Perianth-tube  $1\frac{1}{2}$ –2 in. long, dilated in the upper quarter to a throat  $\frac{1}{2}$  in. diam.; segments linear, ascending,  $\frac{3}{4}$ –1 in. long. Staminal cup  $\frac{1}{4}$  in. long, with bifid teeth between the short filaments; anthers  $\frac{1}{6}$  in. long. Style reaching to the tip of the segments.

Hab. Peninsular India. There is a specimen in the Rottler Herbarium dried from the garden of the Moravian Missionaries in June, 1799. It is included in Hohenacker's 'Plants of Canara' as *Crinum pauciflorum* Miquel.

3. *P. ZEYLANICUM* Linn. Sp. Pl. 417; Bot. Reg. t. 479; Bot. Mag. t. 2548. *P. tiaræflorum* Salisb. Parad. t. 86.—Bulb globose,  $1\frac{1}{2}$ –2 in. diam., not produced into a distinct neck. Leaves 8–12, thin, lanceolate, glossy green, under a foot long, contemporary with the flowers. Peduncle slender, subterete, much shorter than the leaves. Flowers solitary; spathe solitary, lanceolate, tubular at the base; pedicel very short. Perianth-tube 2 in. long, broadly obconic in the upper third; segments lanceolate, as long as the tube. Staminal cup obconic,  $\frac{1}{4}$  in. long, with large bifid teeth between the free tips of the filaments, which are 1– $1\frac{1}{4}$  in. long; anthers linear,  $\frac{1}{4}$  in. long. Style not overtopping the anthers.

Hab. Tropical Asia. Figured by Rumphius and Commelinus at the beginning of the 17th century, and cultivated in Miller's time. We have it from gardens at Nossi-bé (*Hildebrandt* 3207!), and a copy of a figure made by Mr. F. W. Burbidge at Labuan.

4. *P. SICKENBERGII* Aschers. et Schwein. in Berlin Gartenzeit. 1883, 345, with figure.—Bulb ovoid,  $1\frac{1}{2}$  in. diam., with a long neck. Leaves 3–6, linear, grey-green, a foot long, conspicuously spirally twisted, produced after the flowers. Peduncle much shorter than the leaves. Flowers 3–6 in an umbel; spathe-valves 2, lanceolate. Perianth-tube 1– $1\frac{1}{2}$  in. long, obconic in the upper third; segments lanceolate, as long as the tube. Staminal cup obconic, under an inch long, with a bifid deltoid tooth between the very short free part of each filament; anthers linear-oblong. Style overtopping the stamens.

Hab. Desert region on the borders of Egypt and Arabia. Our specimens were gathered in the Sinaitic Peninsula in 1883 by Mr. H. C. Hart. It has the leaves of *P. tortuosum* and flower of *P. maritimum*.

5. *P. COLLINUM* Coss. & Durieu in Ann. Sc. Nat. ser. 4, i. 238. — Closely allied to *P. maritimum*, but smaller in all its parts, with a perianth-tube  $1\frac{1}{2}$ –2 in., segments an inch, and a more obconic staminal cup  $\frac{5}{8}$ – $\frac{3}{4}$  in. long. Pedicels longer, finally  $\frac{1}{2}$ –1 in. long. Capsule and seeds smaller.

Hab. Algeria, *Munby!* *Durando!*

6. *P. MARITIMUM* Linn. Sp. Pl. 418; Cav. Ic. t. 56; Red. Lil. t. 8; Bot. Reg. t. 161. — Bulb globose, 2–3 in. diam., with brown tunics and a short neck. Leaves 5–6, linear, glaucous, persistent, finally 2– $2\frac{1}{2}$  ft. long. Peduncle moderately short, compressed,

1-1½ ft. long. Flowers 5-10 in an umbel; pedicels very short; outer spathe-valves 2, large, ovate. Perianth-tube greenish, 2-3 in. long, funnel-shaped in the upper quarter; segments linear, ascending. 1½ in. long. Staminal cup obconic, an inch long, with deltoid teeth between the free tip of the filaments, which is only ¼ in. long; anthers linear-oblong. Style reaching to the tip of the segments. Capsule-valves about an inch long and broad.

Hab. Throughout the Mediterranean region from Spain to Syria. Flowers white, very fragrant. *P. carolinianum* Linn. (Catesby, Carol. iii. t. 5; Bot. Reg. t. 927), said to be wild in salt-marshes from Carolina to Florida, does not appear to differ specifically from the European plant. Dr. Sereno Watson doubts its occurrence in the United States; but Catesby's figure is not a bad representation of this species, and cannot possibly be *Hymenocallis rotata*, as suggested by Herbert.

7. *P. CANARIENSE* Ker in Bot. Reg. t. 174. *Bollœa canariensis* Parlat.—Bulb globose, 2 in. diam. Leaves 4-6, ensiform, glaucous, 1½-2 ft. long, 1-1½ in. broad. Peduncle moderately stout, 1½-2 ft. long. Flowers 6-10 in an umbel; pedicels elongated; spathe of 2 oblong-lanceolate valves. Perianth-tube 1-1½ in. long, obconic in the upper third; segments lanceolate, an inch long. Staminal cup much shorter than the segments, with bifid teeth between the short free tips of the filaments; anthers ½ in. long. Style reaching to the tip of the segments. Seeds small, turgid.

Hab. Canary Islands. Flowers in October.

8. *P. PARVUM* Dalz. in Hook. Journ. ii. 144.—Bulb globose, with a cylindrical neck. Leaves thin, linear or lanceolate, under a foot long, contemporary with the flowers. Peduncle very slender, compressed, ½-1 ft. long. Flowers 2-4 in an umbel; pedicels ½-¾ in. long; spathe-valve 1, sometimes deeply bifid. Perianth-tube 3-4 in. long, obconic in the upper quarter; segments linear, an inch long. Staminal cup funnel-shaped, half as long as the segments, with a bifid tooth between each of the short free tips of the filaments; anthers linear. Style overtopping the anthers. Seeds few in a cell.

Var. *MALABARICUM* Baker. — Leaves linear. Perianth-tube not more than 2 in. Staminal cup smaller.

Hab. Hills of Western Peninsular India, *Stocks! Law! Ritchie!*

9. *P. VERECUNDUM* Ait. Hort. Kew. i. 412; Bot. Reg. t. 413; Wight, Ic. 2023. *P. biflorum* Roxb. — Bulb globose, 2 in. diam., with a long cylindrical neck. Leaves 6-10, thin, ensiform, contemporary with the flowers, 1-1½ ft. long, ½-¾ in. broad. Peduncle moderately stout, compressed, a foot long. Flowers 2-6 in an umbel; spathe-valves 2, lanceolate-acuminate; pedicels short. Perianth-tube 3-4 in. long, obconic in the upper quarter; segments linear, 1½ in. long. Corona obconic, ¾-1 in. long, with a bifid tooth between the free tip of each filament, which is ½ in. long; anthers linear, ⅓ in. long. Style overtopping the stamens.

Hab. North India, from the Punjaub eastward to the Sikkim Terai. We have a drawing made by Dr. Aitchison in 1878 and a specimen sent by Messrs. Sander in 1883.

10. *P. LONGIFLORUM* Roxb. Fl. Ind. ii. 125. *P. cambayense* Herb. — Bulb globose, 1½-2 in. diam., with a cylindrical neck. Leaves

thin, ensiform, a foot long,  $\frac{1}{2}$ –1 in. broad, contemporary with the flowers. Peduncle much shorter than the leaves, compressed. Flowers usually solitary, sessile; spathe-valve single, very acuminate. Perianth-tube greenish, 5–6 in. long, obconic in the upper neck; segments lanceolate, 2 in. long. Staminal cup above an inch long, with a bifid tooth between the free tip of each filament, which is  $\frac{1}{2}$  in. long; anther linear. Style reaching to the tip of the segments.

Hab. Central and Peninsular India. Is in the Rottler Herbarium. The description of *P. tristylum* Rijk in Rev. Hort. 1880, 446, from gardens in Java, agrees with this, except that it is said to have three styles. All the *Panocratia* I have seen have a distinctly capitate stigma, at most faintly 3-lobed.

11. *P. TORTUOSUM* Herb. in Ann. Nat. Hist. iv. 28. *P. tortifolium* Boiss. — Bulb globose,  $1\frac{1}{2}$ –2 in. diam., produced into a long cylindrical neck. Leaves 6–12, linear, contemporary with the flowers,  $\frac{1}{2}$ –1 ft. long, conspicuously spirally twisted. Peduncle very short, moderately stout. Flowers 2–4 in an umbel; spathe-valve single, large, ovate; pedicels very short. Perianth-tube 5–6 in. long, obconic at the apex; segments linear, greenish, ascending, above 2 in. long. Staminal cup obconic, above an inch long, distinctly toothed between the short free tips of the filaments; anthers linear,  $\frac{1}{4}$  in. long. Style overtopping the anthers. Capsule-valves oblong, an inch long.

Hab. Arabia and Egypt. Discovered by Fischer in 1837. Flowers in late autumn and winter.

12. *P. TRIANTHUM* Herb. in Ann. Nat. Hist. iv. 28. *P. tenuifolium* Hochst. *P. Chapmanii* Harvey. — Bulb globose, 1–2 in. diam., with brown tunics and a long cylindrical neck. Leaves 6–8, narrow linear, a foot or more long, straight. Peduncle short, slender. Flowers 1–3 in an umbel; spathe lanceolate-acuminate, bifid at the tip. Perianth-tube white,  $\frac{1}{2}$  ft. long, obconic in the upper inch; segments lanceolate, acute, ascending, 2 in. long. Staminal cup about an inch long, with bifid teeth between the free tips of the filaments, which are  $\frac{1}{4}$  in. long; anthers linear, yellow. Style overtopping the anthers; stigma 3-lobed.

Hab. Throughout Tropical Africa, from Nubia to Senegambia, Guinea, and Damara-land. Flowers in spring and summer. Not yet introduced into cultivation. It may be the imperfectly-described *P. maximum* Forsk., from Arabia felix.

#### 46. HYMENOCALLIS Salisb.

*Perianth* hypocrateriform; tube cylindrical; segments equal, linear or lanceolate. *Stamens* united in a distinct cup; free portion of filament filiform; anthers linear, versatile. *Ovary* 3-celled; ovules 2 in each cell, in a bundle from the base of the axis; style long, filiform; stigma capitate, minute. *Capsule* large, bulb-like, finally dehiscent. *Seeds* usually solitary, large, with a thick green spongy testa.—*Rootstock* a tunicated bulb. *Leaves* sessile, lorate or petioled, oblong. *Peduncle* solid, compressed. *Flowers* usually pure white, fragrant, many in an umbel.

Subgenus HYMENOCALLIS PROPER. Staminal cup comparatively small  
free part of filaments long.

Leaves petioled.	Perianth-tube long	. Sp. 1-5.
Leaves petioled.	Perianth-tube short	. Sp. 6-9.
Leaves sessile.	Perianth-tube long	. Sp. 10-16.
Leaves sessile.	Perianth-tube short	. Sp. 17-24.

Subgenus ISMENE (Salisb.) Staminal cup large; free tip of filaments  
short, incurved.

Flowers white	. . .	Sp. 25-30.
Flowers yellow	. . .	Sp. 31.

1. *H. TUBIFLORA* Salisb. in Trans. Hort. Soc. i. 341. *H. guianensis* Herb. *H. petiolata* Roem. *Pancratium guianense* Gawl. in Bot. Reg. t. 265. *P. tubiflorum* and *petiolatum* Schultes.—Bulb ovoid, 3-4 in. diam., with a short neck. Leaves with a thin oblong acute blade 8-12 in. long, 4-5 in. broad at the middle, narrowed gradually to a petiole  $\frac{1}{2}$ -1 ft. long; midrib broad, distinct; veins lax. Peduncle compressed, a foot long. Flowers many in an umbel, sessile; spathe-valves membranous, deltoid-cuspidate, reflexing. Perianth with an erect slender tube 6-8 in. long; segments linear, about 4 in. long. Staminal cup a narrow funnel, an inch long, not toothed between the free part of the filament, which is more than twice as long as the cup; anthers linear,  $\frac{1}{2}$ - $\frac{5}{8}$  in. long. Style overtopping the anthers. Ovules 4 or more in a cell, crowded at the base of the axis.

Hab. Guiana, Trinidad, and the Amazon Valley. Introduced into cultivation at Kew about 1803 from bulbs taken in a captured French vessel from Cayenne, and again by Lambert in 1818.

2. *H. UNDULATA* Herb. App. 44. *H. Borskiana* De Vriese, Descript. 10. *H. Boschiana* Kunth. *Pancratium undulatum* H. B. K.—Bulb ovoid, 3-4 in. diam. Leaves with a thin oblong acute blade a foot long, 5-6 in. broad, narrowed gradually to a long petiole; veins lax, connected by close oblique cross-bars. Peduncle compressed, 2 ft. long. Flowers 9-10 in an umbel, sessile; spathe-valves 4-5, lanceolate. Perianth-tube 6-7 in. long; segments linear, 3-3 $\frac{1}{2}$  in. long. Staminal cup funnel-shaped, an inch long, toothed between the free part of the filaments, which is 1 $\frac{1}{2}$  in. long, tinged with red; anthers linear,  $\frac{1}{2}$  in. long. Style much overtopping the anthers.

Hab. Venezuela, Fendler 1504! First gathered by Humboldt. Introduced into the Botanic Garden of Leyden in 1845 by M. Borski.

3. *H. MORITZIANA* Kunth, Enum. v. 668.—Bulb as thick as a man's fist. Leaves with an oblong acute blade a foot long, narrowed gradually to a long petiole. Peduncle compressed, 1 $\frac{1}{2}$ -2 ft. long. Flowers about 20 in a sessile umbel; outer spathe-valves large, reflexed. Perianth-tube 4 $\frac{1}{2}$  in. long; segments linear, nearly as long as the tube. Staminal cup funnel-shaped, under an inch long, toothed between the free tips of the filaments, which are 1 $\frac{1}{4}$  in. long; anthers linear. Style reaching to the tip of the segments. Ovules 4 in a cell.

Hab. Caracas, Moritz.

4. *H. EUCCHARIDIFOLIA* Baker in Gard. Chron. 1884, i. 700.— Bulb ovoid, 2–3 in. diam. Leaves 4, oblong, acute, shortly petioled, a foot long, 3–4 in. broad at the middle; midrib distinct; veins lax. Peduncle green, acutely angled, under a foot long. Flowers 4–5 in an umbel, subsessile; outer spathe-valves small, lanceolate. Perianth-tube slender, 4–4½ in. long; segments linear, 3–3½ in. long. Staminal cup narrowly funnel-shaped, 1¼ in. long, with 1–2 minute cups between the free tips of the filaments, which are not longer than the cup; anthers linear, ½ in. long. Style overtopping the anthers.

Hab. Tropical America. Described from a plant that flowered at Kew, May, 1884. Exact country not known.

5. *H. BISTUBATA* Herb.; Lindl. in Bot. Reg. 1844, Misc. 53.— Leaves with a green oblong acute blade, 21 in. long, 4 in. broad, narrowed to a short petiole. Peduncle compressed, 1½ ft. long. Flowers about 8 in an umbel, sessile. Perianth-tube above 5 in. long; limb recurved, 3½ in. long. Staminal cup funnel-shaped, rotate at the apex, 2 in. long, with bifid teeth between the free tips of the filaments, which are ¾–1¼ in. long. Style protruded 2 in. from the staminal cup.

Hab. Known only from Dean Herbert's description. It was received by him from Hartweg. Intermediate between the two subgenera, and perhaps a garden hybrid.

6. *H. SPECIOSA* Salisb. in Trans. Hort. Soc. i. 340. *Pancratium speciosum* Salisb. in Trans. Linn. Soc. ii. 73, t. 12; Bot. Mag. t. 1453; Red. Lil. t. 412; Bury, Hexand. t. 47. — Bulb globose, 3–4 in. diam. Leaves 12–20 to a bulb, oblanceolate-oblong, acute, bright green, closely veined, 1½–2 ft. long, narrowed very gradually to a short broad channelled petiole. Peduncle glaucous, compressed, 1½ ft. long. Flowers 10–15 in a centripetal umbel; pedicels short; spathe-valves 5–6, lanceolate, green, 3–4 in. long. Perianth-tube greenish, about 3 in. long; segments 1½–2 in., as long as the tube. Staminal tube funnel-shaped, 1¼–1½ in. long, 1¼ in. diam. at the throat, toothed between the free tips of the filaments, which are a little longer than the cup; anthers linear, ½ in. long. Style declinate, nearly as long as the segments. Ovules 2 in a cell.

Hab. West Indies. Described from a plant that flowered at Kew, Nov., 1877. Common in cultivation. We have at Kew the originals of the drawings of Salisbury's paper in vol. ii. of the 'Transactions of the Linnean Society,' purchased at Burchell's sale.

7. *H. OVATA* Roem. Amaryll. 169. *H. amœna* Herb. (but not *Pancratium amœnum* Salisb.). *Pancratium ovatum* Miller, Dict. No. 9; Ker in Bot. Reg. t. 43. *P. fragrans* Salisb. in Trans. Linn. Soc. ii. 72, t. 11. *P. amœnum* Ker in Bot. Mag. t. 1467. — Bulb 3–4 in. diam. Leaves with an oblong acute blade a foot or more long, 4–6 in. broad, narrowed gradually to a short broad petiole. Peduncle compressed, about as long as the leaves. Flowers 6–10 in a sessile umbel; spathe-valves ovate. Perianth-tube greenish, 2–2½ in. long, subterete; segments linear, but little longer than the tube. Staminal cup regularly funnel-shaped, an inch long, toothed or entire between the free tips of the filaments, which are 1½ in.

long; anthers linear,  $\frac{1}{2}$  in. long. Style much overtopping the anthers. Ovules 2 in a cell.

Hab. West Indies. Nearly allied to *H. speciosa*. It was figured by Ehret (tab. 98), and noticed by Linnæus as a var. of *P. amboinense*. Salisbury's *P. amatum* is a form of *H. caribæa*. *H. ornata* Roem., judging from the description, differs from *ovata* by its flowers with pedicels  $\frac{1}{2}$ — $\frac{3}{4}$  in. long. *H. ovalifolia* Herb. (Lodd. Bot. Cab. t. 510) is apparently a small slender form of this species.

8. *H. SKINNERIANA* Herb. in Bot. Reg. 1843, Misc. No. 59.—Bulb middle-sized. Leaves oblong, acute, petioled, a foot long, 5 in. broad. Flowers 6 in a sessile umbel; spathe-valves lanceolate,  $1\frac{1}{2}$  in. long. Perianth-tube  $2\frac{1}{2}$  in. long; segments a little longer than the tube. Staminal cup narrowly funnel-shaped, toothed between the free tips of the filaments, which are scarcely longer than the cup; anthers linear. Style overtopping the anthers.

Hab. Guatemala, *Skinner*. Flowered by Dean Herbert at Spofforth in March, 1843.

9. *H. GLAUCA* Roem. Amaryll. 173. *Pancratium glaucum* Zucc. *Choretis glauca* Knowles & Westc. Floral Cab. ii. 101, with figure. *H. Choretis* Hemsley. — Bulb globose, middle-sized. Leaves with an oblong acute glaucous lamina  $1\frac{1}{2}$  ft. long, 3–4 in. broad, narrowed gradually to a short deeply channelled petiole. Peduncle a foot or more long. Flowers 2–3 in an umbel, subsessile; spathe-valves small, lanceolate. Perianth-tube greenish, 2–3 in. long; segments about as long as the tube. Staminal cup above an inch long, spreading at the throat, toothed between the free tips of the filaments, which are about as long as the cup; anthers linear,  $\frac{1}{2}$  in. long. Style overtopping the anthers. Ovules 2 in a cell.

Hab. Mexico, in the Province of Oaxaca. Introduced into cultivation in 1838, but I have never seen a specimen.

10. *H. LITTORALIS* Salisb. in Trans. Hort. Soc. i. 338. *H. adnata* Herb. *Pancratium littorale* Jacq. Hort. Vind. iii. 41, t. 750; Salisb. in Trans. Linn. Soc. ii. 74, t. 13. *P. americanum* Miller.—Bulb 3–4 in. diam. Leaves 10–12, ensiform, acute, sessile, multifarious, suberect, bright green, 2– $2\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad at the middle, narrowed to an inch at the base. Peduncle ancipitous,  $1\frac{1}{2}$ –2 ft. long. Flowers 4–8 in a sessile umbel; outer spathe-valves deltoid, 2–3 in. long. Perianth-tube 6–7 in. long, tinged with green; segments linear, recurved, 4 in. long, adnate to the base of the staminal cup. Staminal cup broadly funnel-shaped, about an inch long,  $1\frac{1}{2}$  in. diam. at the throat, toothed at the edge between the free tips of the filaments, which are 2 in. long; anthers linear,  $\frac{1}{2}$  in. long. Style reaching to the anthers. Ovules 4–6 in a cell.

Hab. Widely spread in Tropical America. It was cultivated by Dr. Richardson at Bierley in 1742. Very variable, the principal named forms being *H. Dryandri* Roem. (Bot. Mag. t. 825), with tube and segments both much shorter than in the type; *H. disticha* Herb., with leaves rather broader and more distinctly ribbed, and perianth-tube and segments both 4–5 in. long; *H. acutijolia* Herb. (Bot. Mag. 2621), with narrow leaves, and segments an inch longer than the tube, which is under 3 in. long; and *H. Staplesiana* Roem., with leaves an inch broad, a small staminal cup and perianth-segments an inch shorter than the tube, which is 3–4 in. long. My description of the type is made mainly from Jacquin's specimen at the British Museum, and of *P. Dryandri* from a plant that flowered at Kew in April, 1878, received from the

Duke of Northumberland's garden at Sion House, and Dryander's plant, dried from Dr. Pitcairn's garden in 1782. There is a good figure by Ehret (Trew. t. 27). I cannot separate *H. panamensis* Lindl. and *H. insignis* Kunth.

11. *H. PEDALIS* Herb. App. 44. *Pancratium pedale* Lodd. Bot. Cab. t. 809; Lindl. in Bot. Reg. t. 1641.— Leaves lorate, arcuate, bright green, firm in texture, about 2 ft. long, 2 in. broad above the middle, narrowed to under an inch at the base. Peduncle about as long as the leaves. Flowers about a dozen in a sessile umbel, with broad spathe-valves. Perianth-tube very slender, 7 in. long; segments very narrow, 5 in. long. Staminal cup funnel-shaped, about 1 in. long, not at all spreading at the throat; free tips of filaments above 2 in. long; anthers linear,  $\frac{3}{4}$  in. long. Style reaching up to the anthers. Ovules 5–6 in a cell.

Hab. Introduced from Truxillo about 1820 by Mr. Harrison, of Aigburth. Described from a dried specimen of Dean Herbert's. Doubtfully distinct from *H. littoralis*.

12. *H. TENUIFLORA* Herb. App. 44. — Leaves thinner and more spreading than in *H. littoralis*, acute, 2–2½ in. broad at the middle, narrowed to an inch at the base. Flowers 10–12 in a sessile umbel. Perianth-tube very slender, 5–6 in. long; segments very narrow, 3–4 in. long. Staminal cup funnel-shaped,  $\frac{3}{4}$ –1 in. long; free tips of stamens 1½–2 in. long; anthers linear, ½ in. long. Style reaching to the anthers.

Hab. New Granada, *Lieut. Holton* 143! Described from a plant that flowered at Kew in 1879. Probably a mere variety of *H. littoralis*. It was cultivated by Herbert in 1814. I cannot distinguish from this the Ceylonese plant (C. P. 2339) distributed by Dr. Thwaites as *Pancratium malabathricum*.

13. *H. SENEGAMBICA* Kunth and Bouché in Ind. Sem. Berol. 1848, 12. — Leaves subdistichous, lorate, acute, arcuate, 2 ft. long, 2 in. broad above the middle, narrowed to an inch at the base. Peduncle about as long as the leaves. Flowers 6–8 in a sessile umbel; outer spathe-valves ovate. Perianth-tube slender, 5–6 in. long; segments very narrow, 4 in. long. Staminal cup funnel-shaped, about an inch long, 1–1½ in. diam. at the throat; free tips of filaments 2 in. long; anthers linear. Ovules 6–8 in a cell.

Hab. Sierra Leone, teste *Kunth*. Congo, on sandy shores between Ambriz and Quizembo, *Welwitsch* 4029! Scarcely, if at all, distinguishable from *H. tenuiflora*.

14. *H. CAYMANENSIS* Herb. Amaryll. 614. *Pancratium patens* Lindl., non Red. — Leaves thinner, more spreading and more oblanceolate than in *H. littoralis*, 2½–3 in. broad above the middle, narrowed to an inch at the base. Peduncle stout, above 2 ft. long. Flowers 6 or more in a sessile umbel. Perianth-tube 5–6 in. long; segments linear, about 4 in. long, ¼ in. broad. Staminal cup obconic, about an inch long; free filaments 2–2½ in. long; anthers linear,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Style overtopping the anthers. Ovules 2 in a cell.

Hab. Florida, *Curtiss* 2830! Cuba, *Wright* 3245! Jamaica, *March* 1825! Island of Grand Cayman, *Hort. Herbert*! Doubtfully distinct specifically from *H. caribæa*.

15. *H. HARRISIANA* Herb. in Bot. Reg. 1846, Misc. No. 63; Baker in Bot. Mag. t. 6562. — Bulb globose, 1½ in. diam. Leaves

3-5, oblanceolate, about a foot long, 2 in. broad above the middle; base very narrow. Peduncle slender, rather glaucous, under a foot long. Flowers 2-3 in a sessile umbel; spathe-valves lanceolate. Perianth-tube slender, 3-4 in. long; segments linear,  $2\frac{1}{2}$ -3 in. long. Staminal cup funnel-shaped,  $\frac{3}{4}$  in. long, very plicate,  $\frac{1}{2}$ - $\frac{3}{4}$  in. diam. at the throat, with a small tooth between the free tips of the filaments, which are  $1\frac{1}{2}$  in. long. Style reaching up to the anthers. Ovules 2 in a cell.

Hab. Mexico. Received alive lately from Col. Trevor Clarke and Messrs. Elwes, Bull, and Ware. Described from a plant that flowered at Kew, May, 1879.

16. H. HORSMANNI Baker. — Bulb middle-sized. Leaves few, thin, oblanceolate, rather glaucous, a foot long,  $1-1\frac{1}{2}$  in. broad above the middle, deltoid at the apex, very narrow at the base. Peduncle 3-4 in. long. Flowers 1-3 in a sessile umbel; spathe-valves small, lanceolate. Perianth-tube  $4-5\frac{1}{2}$  in. long; segments very narrow,  $2\frac{1}{2}$  in. long. Staminal cup rotate, under an inch long,  $1\frac{1}{2}$  in. diam. at the throat; free tips of filaments  $1\frac{1}{2}$  in. long; anthers linear,  $\frac{1}{2}$  in. long. Style reaching up to the anthers. Ovules 2 in a cell.

Hab. Mexico. Described from living specimens sent by Mr. F. Horsman, of Colchester, in July, 1883. An allied plant in Gay's Herbarium, dried from the Jardin des Plantes in June, 1860, has an oblong-lanceolate leaf a foot long, 3 in. broad at the middle, and a short pedicel.

17. H. CARIBÆA Herb. App. 14. *Pancratium caribæum* Linn. (Commel. Hort. ii. t. 87); Gawl. in Bot. Mag. t. 826. *P. declinatum* Jacq. Hort. Vind. iii. 11, t. 10; Red. Lil. t. 414; Lodd. Bot. Cab. t. 558. *P. amœnum* Salisb. in Trans. Linn. Soc. ii. 71, t. 11.— Bulb globose, 3-4 in. diam. Leaves a dozen or more, multifarious, lorate, acute, 2-3 ft. long, 2-3 in. broad above the middle, narrowed to an inch at the base, thinner and more spreading than in *H. littoralis*. Peduncle acutely angled, little shorter than the leaves. Flowers 6-12 in a sessile umbel; spathe-valves lanceolate-deltoid. Perianth-tube 2-3 in. long; segments linear,  $3-3\frac{1}{2}$  in. long. Staminal cup regularly obconic, an inch long, faintly 2-toothed between the free tips of the filaments, which are  $1\frac{1}{2}$ -2 in. long; anthers linear,  $\frac{1}{2}$  in. long. Style overtopping the anthers. Ovules 2 in a cell.

Hab. West Indies. Described mainly from a plant that flowered at Kew in June, 1872. Also received alive from Messrs. Veitch and Wilson Saunders. *P. patens* Red. is a form with a tube 3 in. and segments 4 in. long. *P. latifolium* Miller probably belongs here. I cannot distinguish *H. angusta* Herb. (*Pancratium angustum* Ker in Bot. Reg. t. 221), except by its narrower leaves. *H. obtusata* Griseb., from Surinam, is said to differ from *caribæa* by its more obtuse leaves, tube and segments each 3 in. long, and sinuses of the staminal cup less produced.

18. H. CRASSIFOLIA Herb. App. 44 (misprinted *crassiflora* in Kunth). *Pancratium crassifolium* R. & S. Syst. vii. 921; Baker in Saund. Ref. Bot. t. 331. *P. coronarium* and *occidentale* Leconte.— Bulb ovoid,  $3\frac{1}{2}$ -4 in. diam. Leaves 6-8, lorate, obtuse, bright green, firm, suberect, 2 ft. long, 2 in. broad at the middle, narrowed to  $\frac{3}{4}$ -1 in. at the base. Peduncle compressed, 2 ft. long. Flowers about 4 in a sessile umbel; outer spathe-valves large, deltoid.

Perianth-tube greenish,  $2\frac{1}{2}$ –3 in. long; segments linear, 3 in. long. Staminal cup regularly funnel-shaped,  $1\frac{1}{4}$  in. long, usually toothed between the free tips of the filaments, which are about as long as the cup; anthers linear,  $\frac{1}{2}$  in. long. Style overtopping the anthers. Ovules 2 in a cell.

Hab. Southern United States, *Chapman!* Bahamas, *Hort. Saunders!* Described from a plant flowered by Mr. Wilson Saunders in 1871, and since received from Messrs. Bull and Ware. First introduced by Fraser about 1816. Very near *H. caribæa*.

19. *H. EXPANSA* Herb. App. 44. *Pancratium expansum* Sims in Bot. Mag. t. 1941.—Leaves longer, narrower, and more erect than in *H. caribæa*. Peduncle ancipitous, 2 ft. long. Flowers 9–10 in a sessile umbel; outer spathe-valves large, deltoid. Perianth-tube more slender than in *H. caribæa*,  $3\frac{1}{2}$ –4 in. long; segments linear, 4 in. long. Staminal cup funnel-shaped, an inch long, with a small tooth between the free tips of the filaments, which are 2 in. long; anthers linear,  $\frac{1}{2}$  in. long. Style overtopping the anthers. Ovules 2 in a cell.

Hab. West Indies. Intermediate between *H. caribæa* and *littoralis*. Described from a plant sent by Mr. Elwes, which flowered at Kew, July, 1878.

20. *H. MACROSTEPHANA* Baker in Gard. Chron. 1879, i. 430; Bot. Mag. t. 6436.—Bulb ovoid, 2 in. diam., with brown tunics and a produced neck. Leaves 8–9, multifarious, oblanceolate, bright green, deltoid at the apex,  $2\frac{1}{2}$ –3 ft. long, 2–3 in. broad above the middle, narrowed to an inch above the base. Peduncle shorter than the leaves. Flowers 6–10 in a centripetal umbel; pedicels very short; spathe-valves lanceolate. Perianth-tube greenish, 3 in. long; segments linear-lanceolate, a little longer than the tube. Staminal cup broadly funnel-shaped, 2 in. long, 2 in. diam. at the throat, obscurely 3-toothed between the arcuate-incurved free tips of the filaments, which are an inch long; anthers linear,  $\frac{1}{2}$  in. long. Style overtopping the anthers.

Hab. Described from living plants sent in March, 1879, from Sir Philip Egerton and the Duke of Northumberland. Probably it is the hybrid between *H. speciosa* and *calathina*, mentioned by Herbert in Journ. Hort. Soc. ii. 18.

21. *H. GALVESTONENSIS* Baker. *Choretis galvestonensis* Herb. Amaryll. 221.—Leaves linear,  $1\frac{1}{2}$ –2 ft. long,  $\frac{3}{4}$ –1 in. broad. Peduncle 1– $1\frac{1}{2}$  ft. long. Flowers 4–6 in a sessile umbel; outer spathe-valves large, ovate. Perianth-tube greenish,  $1\frac{1}{2}$ – $2\frac{1}{2}$  in. long; segments linear,  $2\frac{1}{2}$  in. long. Staminal cup regularly funnel-shaped,  $1-1\frac{1}{4}$  in. long, not spreading at the edge; free tips of filaments  $\frac{5}{8}$  in. long; anthers linear,  $\frac{1}{2}$  in. long. Style overtopping the anthers.

Hab. Texas, *Drummond* 370! 412! *Hall* 630!

22. *H. PALMERI* S. Wats. Cont. ix. 301.—Bulb narrowly oblong, 4–5 lin. diam. Leaves linear, a foot long,  $\frac{1}{4}$  in. broad. Peduncle slender, under a foot long. Flower solitary, with 3 narrow linear spathe-valves. Perianth-tube  $3\frac{1}{2}$ –4 in. long; segments as long as the tube, a line broad. Staminal cup funnel-shaped,  $1\frac{1}{4}$  in. long, acuminately lobed between the free tips of the filaments, which are one-third shorter than the segments.

Hab. Florida; Biscayan Bay, *Dr. Palmer* 554. Gathered in 1874.

23. *H. HUMILIS* S. Wats. Cont. ix. 301.—Bulb  $\frac{3}{4}$  in. diam., upon a thick rootstock. Leaves linear, 4–6 in. long,  $\frac{1}{6}$  in. broad. Peduncle slender, rather shorter than the leaves. Flower solitary; spathe-valves 3, narrow linear, greenish. Perianth  $1\frac{1}{4}$  in. long, dilated at the tip; segments linear, 2 in. long. Staminal cup broadly funnel-shaped, 8 lines long, truncate between the free tips of the filaments, which are one-third shorter than the segments and style.

Hab. Florida; Indian River, *Dr. Palmer* 555. Gathered in 1874.

24. *H. LACERA* Salisb. in Trans. Hort. Soc. i. 338. *H. rotata* Herb. *Panocratium rotatum* Ker in Bot. Mag. t. 827; Lodd. Bot. Cab. t. 19; Baker in Saund. Ref. Bot. t. 357.—Bulb ovoid,  $1\frac{1}{2}$ –2 in. diam., with a produced neck and copious stolons. Leaves 6–8 to a bulb, linear, bright green, 1– $1\frac{1}{2}$  ft. long, an inch broad. Peduncle slender, compressed, as long as the leaves. Flowers 2–6 in a sessile umbel; spathe-valves small. Perianth-tube greenish, 3–4 in. long; segments linear, as long as the tube. Staminal cup very rotate,  $1\frac{1}{2}$ –2 in. diam. at the spreading margin; free tips of filaments  $1\frac{1}{2}$  in. long; anthers linear,  $\frac{1}{2}$  in. long. Style much overtopping the anthers. Ovules 2 in a cell.

Var. *H. PALUDOSA* Salisb. l. c. *H. mexicana* Herb. *H. disciformis* and *Dillenii* Roem. *Panocratium mexicanum* L. (Dill. Hort. Elth. t. 222). *P. disciforme* Red. Lil. t. 155. — Perianth-tube and segments shorter. Staminal cup about an inch in diam. at the edge.

Hab. Southern United States. *Ismene Knightii* Knowles & West, Floral Cab. ii. 51, appears to be a mere form of this species, with a 10–12-flowered umbel.

#### Subgenus ISMENE (*Salisb.*).

25. *H. QUITOENSIS* Herb. App. 44. *Ismene tenuifolia* Baker in Bot. Mag. t. 6397. — Bulb globose,  $1\frac{1}{2}$ –2 in. diam., with brown tunics and a cylindrical neck. Leaves 6–8, tufted, thin, linear, acute, bright green, a foot long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad at the middle. Peduncle slender, 4–8 in. long. Flower solitary, sessile, with 2 subulate spathe-valves. Perianth-tube slender, greenish, 3–4 in. long, slightly curved at the apex; segments lanceolate, suberect,  $2\frac{1}{2}$ –3 in. long,  $\frac{1}{2}$  in. broad. Staminal cup obconic, 2 in. long,  $1\frac{1}{2}$  in. diam. at the throat, white ribbed with green, with large quadrate sharply-toothed processes between the inflexed free tips of the filaments, which are  $\frac{3}{4}$  in. long; anthers linear,  $\frac{1}{3}$  in. long. Style exerted from the staminal cup.

Hab. Mountains of Ecuador, especially the Cerro of Santana, near Guayaquil, flowering in January, *Pavon!* *Jameson* 529! *Spruce* 6454! Described from a plant flowered in June, 1878, by Messrs. E. G. Henderson.

26. *H. ANDREANA* Nichols. Dict. Gard. ii. 164. *Ismene Andreana* Baker in Gard. Chron. 1884, i. 11; Rev. Hort. 1884, 129, 468; 'Garden,' May, 1884.—Bulb as large as an apple. Leaves several, tufted, linear, pale green, weak, 12–15 in. long,  $\frac{3}{4}$  in. broad at the middle. Peduncle slender, shorter than the leaves. Flower solitary; spathe-valves small, linear. Perianth-tube green, cylindrical, curved at the top,  $4\frac{1}{2}$  in. long; segments linear, white,  $3\frac{1}{2}$ –4 in. long.

Staminal cup obconic, nearly 3 in. long, 3-4 in. broad at the throat, white, striped with green, with rounded entire processes between the abruptly reflexed free tips of the filaments, which are an inch long; anthers linear,  $\frac{1}{2}$  in. long. Style exerted from the staminal cup.

Hab. Andes of Ecuador, alt. 8000 ft., on the banks of the Rio Ambocas, *André* 4546! Gathered in 1876.

27. H. DEFLEXA Baker. *Ismene deflexa* Herb. in Bot. Reg. 1839, Misc. No. 142. — Leaves ensiform, acute, a foot long, under 2 in. broad. Peduncle ancipitous. Flowers 3-4 in a sessile umbel; spathe-valves small. Perianth-tube curved,  $1\frac{1}{2}$ -2 in. long; segments linear, 3-4 in. long. Staminal cup funnel-shaped, 2-3 in. long, with rounded recurved processes between the free tips of the filaments, which are an inch or more long; anthers linear,  $\frac{1}{3}$  in. long. Style protruded  $1\frac{1}{2}$ -2 in. from the staminal cup.

Hab. A native of the Andes of Peru, at San Mateo, according to Herbert, but Col. Trevor Clarke has recently raised it by crossing *H. calathina* and *Elisena longipetala*.

28. H. NUTANS Baker. *Ismene nutans* Herb. *Pancreatium nutans* Ker (Bot. Mag. t. 1561). — Leaves lorate, obtuse, above 2 ft. long. Peduncle 2-edged. Flowers 3-4 in a sessile umbel. Perianth-tube green, curved, about an inch long; segments linear, white, twice as long as the tube. Staminal cup funnel-shaped,  $1\frac{1}{2}$  in. long, irregularly lacerated between the free tips of the filaments, which are  $\frac{1}{4}$ - $\frac{1}{3}$  in. long; anthers large, linear. Style reaching nearly to the tip of the segments.

Hab. Supposed to have been imported from Brazil, but more likely Andine. I have not seen a specimen, and my description is made from the Bot. Mag. figure.

29. H. MACLEANA Nichols. Dict. Gard. ii. 1650. *Ismene Macleana* Herb. in Bot. Mag. t. 3675. — Bulb ovoid, 2 in. diam., very proliferous. Leaves 6-8, laxly superposed, suberect, bright green, a foot or more long, 18-21 lines broad. Peduncle ancipitous, above a foot long. Flowers 2-8 in an umbel, sessile or pedicellate; spathe-valves lanceolate. Perianth-tube greenish, straight,  $1\frac{1}{2}$ -2 in. long; segments linear, suberect, as long as the tube. Staminal cup obconic,  $1\frac{1}{2}$  in. long, white, banded with green, with rounded spreading sharply-toothed processes between the free inflexed tips of the filaments, which are  $\frac{1}{2}$  in. long; anthers linear,  $\frac{1}{4}$  in. long. Style protruded from the staminal cup. Ovules 2 in a cell.

Hab. Andes of Peru, introduced by Maclean in 1834. Described from a plant that flowered at Kew in June, 1881, presented by Col. Trevor Clarke. I cannot separate specifically *I. pedunculata* Herb. or *I. virescens* Lindl. in Bot. Reg. 1841, t. 12.

30. H. CALATHINA Nichols. Dict. Gard. ii. 165. *Ismene calathina* Herb. in Bot. Mag. t. 2685. *I. cyathiformis*, *narcissiflora*, and *Tagliabuei* Roem. *Pancreatium calathinum* Ker in Bot. Reg. t. 215. *P. narcissiflorum* Jacq. Fragm. t. 138. *P. calathiforme* Red. Lil. t. 353. — Bulb globose, with a cylindrical neck. Leaves 6-8, sub-distichous, superposed, erecto-patent, bright green, lorate,  $1\frac{1}{2}$ -2 ft. long,  $1\frac{1}{2}$ -2 in. broad. Peduncle 2-edged,  $1\frac{1}{2}$ -2 ft. long. Flowers 2-5 in a sessile umbel; outer spathe-valves large, ovate. Perianth-tube green, funnel-shaped at the apex, 3-4 in. long; segments

white, lanceolate, as long as the tube,  $\frac{1}{2}$  in. broad. Staminal cup obconic, white, striped with green, 2 in. long, above 2 in. diam. at the throat, with rounded spreading toothed processes between the free tips of the filaments, which are  $\frac{1}{2}$  in. long; anthers linear,  $\frac{1}{2}$  in. long. Style exerted from the staminal cup.

Hab. Andes of Peru and Bolivia. Introduced into cultivation in 1794. We have it also from Guatemala and Buenos Ayres, probably cultivated.

31. *H. AMANCAES* Nichols. Dict. Gard. ii. 165. *Narcissus Amancaes* Ruiz et Pav. Fl. Peruv. iii. 53, fig. 283. *Paneratium Amancaes* Ker in Bot. Mag. t. 1224; Bot. Reg. t. 660. *Ismene Amancaes* Herb. *I. crinifolia* Salisb.—Bulb globose,  $1\frac{1}{2}$ –2 in. diam., with a cylindrical neck half a foot long. Leaves 4–5, laxly superposed, lorate, bright green, suberect,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$ –2 in. broad. Peduncle ancipitous, 1–2 ft. long. Flowers 3–6, sessile or shortly pedicellate; spathe-valves lanceolate. Perianth-tube greenish yellow, 3 in. long; segments linear, bright yellow, 2– $2\frac{1}{2}$  in. long. Staminal cup obconic, 2 in. long, 2 in. diam. at the throat, bright yellow, striped with green, with incurved bifid toothed deltoid processes between the free tips of the filaments, which are  $\frac{1}{2}$  in. long; anthers small, linear-oblong. Style sometimes exerted from the staminal cup. Ovules 2 in a cell.

Hab. Peru, especially on the Hill of Amancaes, near Lima. Described from plants that flowered at Kew in June–July, 1878–9. Bot. Reg. t. 1665 represents a hybrid between this species and *H. calathina*.

#### 47. ELISENA Herb.

Perianth-tube short, broadly funnel-shaped; segments long, equal, linear. Stamens as long as the segments, united at the base in a large deflexed funnel-shaped cup; upper part of filament long, filiform; anthers linear, versatile. Ovary 3-celled; ovules 2, basal, collateral; style long, filiform; stigma capitate. Fruit not seen fully developed, but probably as in *Hymenocallis*.—Rootstock a tunicated bulb. Leaves lorate. Peduncle long, solid. Flowers white, few in an umbel.

1. *E. RINGENS* Herb. Amaryll. 201. *Paneratium ringens* Ruiz et Pav. Fl. Peruv. iii. 53, t. 283. *Liriope ringens* Herb. *Lirioopsis ringens* Reich.—Bulb globose,  $1\frac{1}{2}$  in. diam. Leaves 5–6, linear-lorate,  $1\frac{1}{2}$  ft. long. Peduncle ancipitous, longer than the leaves. Flowers about 5 in a nearly sessile umbel; spathe-valves lanceolate. Perianth-tube  $\frac{3}{4}$  in. long; segments linear,  $1\frac{1}{2}$  in. long. Staminal cup funnel-shaped,  $\frac{1}{2}$  in. long; free tips of filaments 1– $1\frac{1}{4}$  in. long; anthers linear-oblong. Style overtopping the anthers.

Hab. Andes of Peru.

2. *E. SUBLIMIS* Herb. in Bot. Mag. sub t. 3873.—Habit and leaves of *E. ringens*. Flowers about 6 in an umbel; pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; spathe-valves larger. Perianth-tube under  $\frac{1}{2}$  in. long; segments linear. 2 in. long. Staminal cup longer; free tips of filaments only  $\frac{1}{2}$  in. long.

Hab. Andes of Peru; Caxamarquilla, gathered by Maclean.

3. *E. LONGIPETALA* Herb. in Bot. Reg. xxiv. Misc. 79; Bot. Mag. t. 3873; Baker in Saund. Ref. Bot. t. 264.—Bulb  $1\frac{1}{2}$ –2 in. diam., with a long cylindrical neck. Leaves about 6, lorate, stiffly suberect, light green,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$  in. broad. Peduncle ancipitous, 2–3 ft. long. Flowers 5–10 in a nearly sessile umbel; outer spathe-valves ovate. Perianth-tube  $\frac{1}{4}$ – $\frac{1}{3}$  in. long and broad; segments linear, 4 in. long. Staminal cup funnel-shaped, deflexed at a right angle with the tube,  $1\frac{1}{2}$  in. long with the edge reflexed between the free tips of the filaments, which are  $2\frac{1}{2}$  in. long; anther small, linear-oblong. Style overtopping the anthers.

Hab. Andes of Peru and South Ecuador, alt. 6000–8000 ft. Described from a plant that flowered at Kew, May, 1878. Received also alive from Messrs. Wilson Saunders, Elwes, Henderson, Veitch, and Colonel Trevor Clarke.

#### 48. VAGARIA Herb.

*Perianth*-tube short, funnel-shaped at the apex; segments equal, lanceolate, ascending, with a broad green keel. *Stamens* inserted at the throat of the tube; filaments quadrate at the base, with a tooth on each side; anthers small, oblong, versatile. *Ovary* globose, 3-celled; ovules 2–3 in a cell, attached to the middle of the placenta; style filiform; stigma capitate. *Capsule* deeply 3-lobed, finally dehiscent. *Seeds* turgid, black.

1. *V. PARVIFLORA* Herb. Amaryll. 226. *Panocratium parviflorum* Desf.; Delile in Red. Lil. t. 471. *Vaginaria* Kunth. *Almyra* Salisb.—Bulb globose,  $1\frac{1}{2}$  in. diam., with brown tunics and a long neck. Leaves 4–6, linear, produced after the flowers, finally 2 ft. long. Peduncle slender, ancipitous, 9–12 in. long. Flowers 6–8 in an umbel; pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; spathe-valves lanceolate. *Perianth*-tube  $\frac{1}{2}$  in. long; segments rather longer. *Stamens* much shorter than the segments.

Hab. Syria, about Beyrout and Tripoli. Introduced into cultivation at the Jardin des Plantes in 1815. Flowers in autumn.

#### 49. EURYCLES Salisb.

*Perianth*-tube cylindrical; segments subequal, oblong-lanceolate, ascending. *Stamens* inserted at the throat of the tube, shorter than the segments; filaments bordered in the lower half, united in a more or less distinct cup; anthers linear-oblong, versatile. *Ovary* ampulliform, 3-celled; ovules 2 rarely 3 in a cell, medial; style filiform; stigma capitate. *Capsule* globose, succulent. *Seed* usually solitary, globose.—*Rootstock* a tunicated bulb. *Leaves* broad, petioled, with lax arcuate main veins, connected by oblique cross veinlets. *Flowers* many in an umbel, white.

1. *E. SYLVESTRIS* Salisb. in Trans. Hort. Soc. i. 337. *E. australis* Schultes. *E. amboinensis* and *australasica* Loud. *Panocratium amboinense* Linn.; Ker in Bot. Mag. t. 1419; Red. Lil. t. 384. *P. australasicum* Ker. in Bot. Reg. t. 715. *P. nervifolium* Sailsb. Parad. t. 84. *Crinum nervosum* L'Herit. *Amaryllis rotundifolia* Lam.—Bulb 3–4 in. diam. Leaf with a suborbicular cordate cuspidate blade, 6–12 in. broad and a long petiole dilated at the

base; main veins 12-15 on each side of midrib; basal lobes involute. Peduncle terete, 1-1½ ft. long. Flowers 20-30 in a dense umbel, shortly pedicellate; spathe-valves lanceolate. Perianth 2-2½ in. long; segments oblanceolate-oblong, as long as the tube. Appendages to filaments ¼-⅓ in. long, connate only at the very base, furnished with a tooth on each side of the free apex of the filament, which is ½ in. long.

Hab. Malay Peninsula and Philippines to North Australia. Flowers in August and September. Figured by Commelinus and Rumphius at the beginning of the 17th century.

2. *E. CUNNINGHAMI* Aiton; Lindl. in Bot. Reg. t. 1506; A. Cunningham in Bot. Mag. t. 3399.—Bulb 1½ in. diam. Leaf thin, with an oblong acute blade 4-9 in. long, not cordate at the base and a long petiole. Peduncle slender, a foot long. Flowers 10-15 in an umbel; pedicels 1-1½ in. long; spathe-valves small, lanceolate. Perianth 1¼-1½ in. long; segments much longer than the tube. Staminal cup funnel-shaped, half as long as the segments, with two large teeth between the free part of each filament, which is ¼ in. long.

Hab. Queensland and New South Wales; discovered by Allan Cunningham in 1824. Described from a plant that flowered with Messrs. Veitch in the summer of 1874.

#### 50. CALOSTEMMA *R. Br.*

*Perianth-tube* narrowly funnel-shaped; segments oblanceolate-oblong, equal, ascending. *Stamens* inserted at the throat of the perianth-tube; filaments united in a cup in the lower half; anthers small, oblong, versatile. *Ovary* by abortion 1-celled; ovules 2-3, medial, collateral; style filiform; stigma capitate. *Fruit* indehiscent, oblique. *Seed* solitary, globose.—*Rootstock* a tunicated bulb. *Leaves* typically sessile, linear, produced after the flowers. *Flowers* many in an umbel, white, yellow or red.

Leaves sessile, linear . . . . .	Sp. 1-2.
Leaves thin, oblong, petioled . . . . .	Sp. 3.

1. *C. PURPUREUM*, *R. Br. Prodr.* 298; Sims in Bot. Mag. t. 2100; Bot. Reg. t. 422; Flore des Serres, t. 1135.—Bulb globose, 2 in. diam. Leaves linear, sessile, ⅓-¼ in. broad, produced after the flowers. Peduncle slender, compressed, 1-2 ft. long. Flowers 10-20 in an umbel; pedicels ½-1 in. long; spathe-valves large, lanceolate, membranous. Perianth dark purple, ⅓-½ in. long; tube rather shorter than segments. Staminal cup entire or toothed between the free tips of the filaments. Style reaching to the tip of the segments. Seed ⅓ in. diam.

Var. *C. CARNEUM* Lindl. in Bot. Reg. 1840, t. 26.—Flowers rather larger, pale purple or white. Tube as long as the limb.

Hab. South Australia and New South Wales.

2. *C. LUTEUM* Sims in Bot. Mag. t. 2101; Ker in Bot. Reg. t. 421; Lindl. in Bot. Reg. 1840, t. 19; Flore des Serres, t. 1135.

*C. candidum* Lindl.—Just like *C. purpureum*, except that the flower is rather larger and bright yellow. Staminal cup truncate or furnished with deltoid teeth between the free tips of the filaments. Perianth-tube about half as long as the segments. Stamens reaching to the tip of the segments.

Hab. Queensland and New South Wales. Introduced into cultivation with *C. purpureum* in 1819.

3. *C. ALBUM* R. Br. Prodr. 298.—Leaves contemporary with the flowers, with a long petiole and a thin oblong acute blade 4–5 in. long, veined as in *Eurycles*. Peduncle slender, 1–1½ ft. long. Flowers 12–20 in an umbel; pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; spathe-valves lanceolate. Perianth white,  $\frac{1}{2}$  in. long; tube as long as the narrow acute segments. Staminal cup furnished with conspicuous entire or bifid teeth between the free tips of the filaments.

Hab. Gulf of Carpentaria, *R. Brown!* I have more than once seen garden plants named as this species, but never rightly so. It is most like *Eurycles Cunninghami*, much reduced in size in flower and leaf.

## Suborder 2. ALSTRÆMERIÆÆ.

### 51. IXIOLIRION *Fisch.*

*Perianth* regular, without any tube above the ovary; segments subequal, oblanceolate, ascending, acute. *Stamens* shorter than the segments, attached to their claws; anthers oblong, basifixed. *Ovary* clavate, 3-celled; ovules many, superposed; style filiform; stigma trifid. *Capsule* loculicidally 3-valved. *Seeds* small, angled, with a black testa.—*Rootstock* a tunicated bulb. *Leaves* linear, mostly aggregated at the base of the slender erect stem. *Flowers* in a terminal umbel, with often a few others added. Differs from the typical *Alstræmeria*, which are exclusively American, by its bulbous rootstock.

1. *I. MONTANUM* Herb. App. 37; Bot. Reg. 1844. t. 66. *I. Pallasii* F. & M. *Amaryllis montana* Labill. Syr. Dec. ii. 5, t. 1; Red. Lil. t. 241. *Alstræmeria montana* Ker. *A. triflora* Griff. Ic. t. 273.—Bulb ovoid, 1 in. diam., with a neck 2–3 in. below the basal tuft of leaves. Stem about a foot long, with about 4 long linear persistent ascending leaves aggregated at its base and several much smaller ones higher up. Flowers about 4 in a terminal umbel, on long unequal pedicels and often one or two solitary flowers below the umbel. Perianth bright lilac,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long; segments oblanceolate, acute, with 3–5 distinct ribs. Filaments filiform, attached to the base of the segments.

Var. *I. TATARICUM* Herb. App. 37. *I. Ledebourii* F. & M.—Stems more slender. Leaves subulate. Flowers all in a terminal umbel, smaller than in the type.

Hab. The type; Syria, Lebanon, and the Cilician Taurus, where it ascends to 6000 ft., to Central Siberia, Afghanistan and Beloochistan. The variety on the Altai and Mountains of Soongaria. *I. macranthum* Hort. is a form with an unusually large flower. Regel (Descr. vii. 206) calls the collective species *I. tataricum*, and describes five varieties of it.

2. *I. KOLPAKOWSKIANUM* Regel Descr. xii. 208. *Kolpakowskia iviolirioides* Regel Gartenfl. 1878, 294, t. 953.—Bulb  $\frac{1}{2}$  in. diam. Leaves ascending, about 4 aggregated in a basal tuft and 1-2 small ones above it. Flowers 2-4, generally all in a terminal umbel. Perianth-segments  $\frac{3}{4}$ -1 in. long, very narrow, cohering loosely in the lower half. Filaments very short, inserted half-way up the segments.

Hab. Turkestan, alt. 3000-6000 ft. Discovered by Dr. Albert Regel in 1878. Described from a plant flowered by Mr. Elwes in April, 1880.

## 52. ALSTRÆMERIA *Lim.*

*Perianth-tube* none; limb more or less irregular, the lower segment especially of the inner row being different from the other two of the same row in size and marking, and the three outer a different shape from the three inner. *Stamens* slightly declinate, attached to the base of the segments, often unequal; filaments filiform; anthers small, oblong, basifixed. *Ovary* turbinate, 3-celled; ovules many, superposed; style filiform; stigma trifid. *Capsule* loculicidally 3-valved, umbonate at the apex. *Seeds* globose.—*Root* of thickened fibres; rootstock none. *Leaves* cauline, usually resupinate by the twisting of the base or petiole, more fully developed on the short flowerless stems than on those that produce the flowers. *Flowers* various in colour, often spotted, arranged in a simple or compound umbel.

### Brazilian species.

Leaves rigid, strongly nerved.

Umbel simple . . . . . Sp. 1-6.

Umbel compound . . . . . Sp. 7-12.

Leaves thin.

Leaves of flower-stem small, linear or lanceolate . . . . . Sp. 13-16.

Leaves of flower-stem large, oblong or oblong-lanceolate . . . . . Sp. 17-20.

### Chilian species.

Leaves of flowering-stem linear . . . . . Sp. 21-31.

Leaves of flowering-stem lanceolate . . . . . Sp. 32-38.

Leaves of flowering-stem oblong- or obovate-spatulate . . . . . Sp. 39-44.

1. *A. PLANTAGINEA* Mart. in Roem. et Schultes Syst. vii. 739; Schenck in Fl. Bras. iii. 178, tab. 21, fig. 2.—Flowering-stems stiffly erect,  $1\frac{1}{2}$ -2 ft. long. Fully developed leaves crowded, sessile, lanceolate, erecto-patent, 2-3 in. long, moderately firm in texture; those of the flowering-stem usually much smaller, distant, linear or lanceolate. Flowers 5-9 in a simple umbel; bracts 8-12, small, linear; pedicels 1-2 in. long, with linear bracteoles. Perianth 1-1 $\frac{1}{4}$  in. long; segments oblanceolate-unguiculate; inner longer and broader than outer, yellow, spotted with claret-purple. Stamens and style nearly as long as limb.

Hab. Central Brazil; Provinces of Bahia, Goyaz and Minas Geraes, *Martius, Burchell! Gardner!*

2. *A. ISABELLINA* Herb. Amaryll. 86.—Flowering stem 3 ft. long; leaves simple, distant, rigid, lanceolate, ascending, at most 4-5 in. long; edges thickened, stramineous. Umbel simple, 10-15-flowered; bracts numerous, minute, lanceolate; pedicels  $\frac{1}{2}$ - $1\frac{1}{2}$  in. long. Perianth  $1\frac{1}{4}$  in. long; segments all oblanceolate, acute, not spotted,  $\frac{1}{8}$  in. broad, reddish yellow, conspicuously tipped with green. Stamens as long as the segments.

Hab. Central and Southern Brazil; gathered by Isabelle, Sello, Tweedie and lately by Dr. Glaziou (6734).

3. *A. STENOPETALA* Schenk in Mart. Fl. Bras. iii. 174. Flowering stem 3- $3\frac{1}{2}$  ft. long. Leaves lanceolate, rigid, sessile, resupinate, the central ones the largest, 2- $2\frac{1}{2}$  in. long;  $\frac{1}{4}$  in. broad. Umbel simple, many-flowered; pedicels  $\frac{1}{2}$ - $\frac{3}{4}$  in. long; bracts many, linear, sometimes longer than the pedicels. Perianth under an inch long; segments oblanceolate; inner ones acuminate. Stamens as long as the perianth.

Hab. Central Brazil; Serra de Manuel Gomez, *Pohl* 1639.

4. *A. SCHENKIANA* Baker. *A. cuneata* Schenk in Mart. Fl. Bras. iii. 172, non Vellozo.—Flowering stem  $1\frac{1}{2}$ -2 ft. long. Leaves remote, lanceolate, rigid, not resupinate, the central ones an inch long,  $\frac{1}{4}$  in. broad. Umbel simple, 4-5-flowered; pedicels 1- $1\frac{1}{4}$  in. long; bracts 5-6, linear,  $\frac{1}{3}$ - $\frac{1}{2}$  in. long. Perianth horizontal; segments reddish, unspotted; outer oblanceolate-spathulate, inner narrow. Stamens included, the three inner half as long as the limb.

Hab. Central Brazil; San Joao das Antas, *Pohl*. Must be very near *A. isabellina*.

5. *A. GARDNERI* Baker in Journ. Bot. 1877, 261.—Sterile stem a foot long, its leaves spaced out over the upper third, lanceolate, 3 in. long,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad, sharply nibbed. Fertile stem 3 ft. long; its leaves few, small, lanceolate, rigid, ascending. Umbel simple, 5-6-flowered; bracts small; pedicels 2 in. long, not bracteolate. Perianth  $1\frac{1}{2}$  in. long; inner and outer segments both oblanceolate unguiculate, unequal in length,  $\frac{1}{4}$  in. broad. Stamens rather shorter than the segments.

Hab. Central Brazil; Province of Goyaz, *Gardner* 4369!

6. *A. PLATYPHYLLA* Baker in Journ. Bot. 1877, 261.—Sterile stem  $1\frac{1}{2}$  ft. long; its leaves oblong, subpetiolate, reaching 4 in. long,  $1\frac{1}{2}$ - $1\frac{3}{4}$  in. broad, firm in texture, strongly ribbed. Flowering stem above 2 ft. long, its leaves small, distant, ascending, rigid, lanceolate. Umbel simple, 6-flowered; bracts many, small, lanceolate; pedicels 1- $1\frac{1}{2}$  in. long. Perianth  $1\frac{3}{4}$  in. long; segments all oblanceolate, acute, about  $\frac{1}{4}$  in. broad. Stamens distinctly shorter than the perianth-limb.

Hab. Central Brazil; Province of Goyaz, *Gardner* 4368!

7. *A. LONGISTYLA* Schenk in Mart. Fl. Bras. iii. 173.—Flowering stem 2-3 ft. long. Leaves linear, not resupinate, firm in texture,

the central ones the largest, 4-4½ in. long, ⅙ in. broad. Umbel of 5 2-3-flowered rays; bracts 5, linear-lanceolate, 2-4 in. long. Perianth above an inch long; outer segments oblong-spathulate; inner oblanceolate, spotted with purple. Stamens shorter than segments. Style exserted.

Hab. Minas Geraes, near Barbacena, *Pohl*.

8. *A. APERTIFLORA* Baker.—Flowering stem above 3 ft. long, its leaves distant, linear, rigid, lanceolate, acuminate, ascending, at most 1½-2 in. long. Umbel of 4-5 long 4-5-flowered rays; bracts very minute, rigid, lanceolate. Perianth an inch long; segments oblanceolate-unguiculate, reflexing when expanded from half-way down like a Martagon lily, the three inner narrower and more acute than the three outer. Stamens distinctly shorter than the segments.

Hab. Paraguay, between Villa Rica and Caaguazu, *Balansa* 528!

9. *A. SELLOWIANA* Seubert in Mart. Fl. Bras. iii. 173.—Flowering stem above a foot long. Leaves linear, rigid, reaching an inch in length on the flowering stem, 3-4 in. on the sterile stem. Umbel of 2-5 2-3-flowered branches; bracts few, linear, rigid, under an inch long. Perianth-segments an inch long, all oblanceolate-unguiculate. Stamens distinctly shorter than the segments.

Hab. South Brazil, *Sello, Weir* 439!

10. *A. ZAMIOIDES* Baker in Journ. Bot. 1877, 262.—Sterile stem a foot or more long. Leaves lax, erecto-patent, sessile, lanceolate, firm in texture, strongly veined, 4-5 in. long, ¾-1 in. broad. Fertile stem 3-4 ft. long. Leaves distant, sessile, lanceolate, ascending, 2-3 in. long. Umbel of about 6 compound rays 6-8 in. long; bracts many, linear, 1½ in. long. Perianth 1¼-1½ in. long; segments oblanceolate-unguiculate, ⅙-⅓ in. broad, yellow, much spotted with claret-purple. Stamens an inch long.

Hab. Brazil; Province of Goyaz, *Gardner* 4009!

11. *A. BRASILIENSIS* Spreng. Syst. ii. 81.—Flowering stem 3-4 ft. long. Leaves remote, subcoriaceous, not resupinate, the central ones the largest, oblong-lanceolate, 2 in. long, ⅓-½ in. broad. Umbel of 5 1-3-flowered rays; bracts 5, linear. Perianth 1¼ in. long; segments oblong-spathulate, reddish yellow, inner spotted with brown. Stamens shorter than the segments.

Hab. Central Brazil; Provinces of Goyaz and Minas Geraes; gathered by *Pohl* and *Sello*.

12. *A. BURCHELLII* Baker in Journ. Bot. 1877, 262.—Sterile stem 2 ft. long; its leaves mainly confined to the upper half, lanceolate, 3-4 in. long, ¾ in. broad, moderately firm in texture, glaucous beneath. Leaves of the fertile stem linear, erecto-patent, 3-4 in. long. Umbel of 2-3 simple or forked rays 2-3 in. long; bracts about 4, large, linear. Perianth about an inch long; segments all oblanceolate-unguiculate, ¼ in. broad. Stamens about as long as the perianth.

Hab. Central Brazil; Goyaz, *Burchell* 6883-2!

13. *A. CARYOPHYLLEA* Jacq. Hort. Schoen. t. 465. *A. Ligtu* Curt. in Bot. Mag. t. 125, non Linn.—Sterile stem  $\frac{1}{2}$  ft. long, with several thin lanceolate petioled leaves, aggregated near its apex, reaching  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad. Flowering stem  $\frac{1}{2}$ – $1\frac{1}{2}$  ft. long; its leaves few, linear, ascending, very small. Umbel simple, 3–4-flowered; pedicels  $1\frac{1}{2}$ –2 in. long; bracts many, thin, linear, sometimes petioled,  $1$ – $1\frac{1}{2}$  in. long. Perianth-segments oblanceolate, with a long claw, very unequal, the longest  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. long. Stamens shorter than the upper segments.

Hab. Southern Provinces of Brazil, *Gardner* 844! *Mosen* 3805! I cannot from the description alone separate definitely *A. filipendula* Schenck.

14. *A. MONTICOLA* Mart. in Roem. et Schultes Syst. vii. 739; Schenck in Fl. Bras. iii. 175 tab. 22, fig. 1.—Flowering stem 2 ft. long, its leaves thin, linear-lanceolate, remote, glabrous, glaucous beneath,  $2\frac{1}{2}$ –3 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad. Umbel 5–6 rays; pedicels usually simple,  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long; bracts 6–8, linear,  $1\frac{1}{2}$ –2 in. long. Perianth horizontal, nearly 2 in. long; segments all oblanceolate-unguiculate. Stamens nearly as long as the perianth.

Hab. Brazil; Serra dos Lagos, Province of Bahia, *Martius*.

15. *A. FOLIOSA* Mart. in Roem. et Schultes Syst. vii. 740; Schenk in Fl. Bras. iii. 175, tab. 21, fig. 1. —Flowering stem 2 ft. long, its leaves many, thin, ascending, linear, subpetiolate, 3–4 in. long,  $\frac{1}{4}$  in. broad, pubescent beneath. Umbel 3–6-rayed; pedicels 2–3 in. long, 1–2-flowered; bracts many, thin, linear, as long as the pedicels. Perianth  $1\frac{1}{2}$  in. long; outer segments with a long claw and a cuneate-orbicular limb  $\frac{1}{2}$  in. broad; the others oblanceolate-unguiculate. Stamens nearly as long as the perianth.

Hab. Central Brazil; Province of Minas Geraes, *Martius*, *Sello*! *Glaziou* 15499! Three varieties are described.

16. *A. PIAUHYENSIS* Gardn. MSS. — Flowering stem 3 ft. long, its leaves few, distant, linear, erecto patent, not more than an inch long. Sterile stem a foot long, with many thin oblong-spathulate petioled leaves aggregated near its apex, the largest 2–3 in. long,  $1$ – $1\frac{1}{4}$  in. broad. Umbel simple, 4–6-rayed; pedicels 1–2 in. long; bracts many, thin, linear or lanceolate, about an inch long. Perianth  $1\frac{1}{4}$  in. long; segments oblanceolate-unguiculate, acute, not spotted, the outer  $\frac{1}{4}$  in., the inner  $\frac{1}{8}$  in. broad. Stamens shorter than the perianth.

Hab. Brazil; shady woods near Veiras, Province of Piahy, *Gardner* 2324! Nearly allied to *A. pulchella*.

17. *A. PULCHELLA* Linn. fil. Suppl. 206. *A. psittacina* Lehm.; Hook. in Bot. Mag. t. 3033; Lindl. in Bot. Reg. t. 1540. *A. Banksiana* Roem.—Sterile stems under a foot long, with a number of thin oblong petioled leaves 2–3 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad, aggregated at its apex. Flowering stem 2–3 ft. long; leaves scattered, lanceolate or oblong-spathulate. Umbel simple, 5–6-flowered; pedicels  $1$ – $1\frac{1}{2}$  in. long; bracts many, large, lanceolate, foliaceous. Perianth-segments  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. long, dark red, tipped with green, all spotted inside with brown, very unequal, the upper with an obovate-cuneate limb  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad. Stamens nearly as long as the limb.

Hab. Northern Brazil. This is the only Brazilian species now in cultivation. Several of them are only known from a small number of dried specimens, and need further investigation.

18. *A. SCABERULA* Baker in Journ. Bot. 1877, 261. — Flowering stem 4–5 ft. long, with about 30 ascending resupinate leaves of thin texture, pubescent all over and rather glaucous beneath, the lower oblong-lanceolate, 4–5 in. long, an inch broad at the middle, the upper growing gradually smaller. Umbel simple, 5–6-flowered; pedicels  $1\frac{1}{2}$  in. long; bracts 6–9, lanceolate, shorter than the pedicels. Perianth  $1\frac{1}{2}$  in. long; segments all oblanceolate-spathulate, subacute,  $\frac{1}{6}$  in. broad, copiously spotted with claret-brown. Stamens shorter than the segments.

Hab. Central Brazil; Province of Goyaz, *Gardner* 3473!

19. *A. LONGISTAMINEA* Mart. in Roem. et Schultes Syst. Veg. vii. 739; Schenk in Fl. Bras. iii, tab. 20, fig. 2. — Flowering stem under 2 ft. long, its leaves distant, lanceolate or linear, the largest 2–3 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad. Umbel 5-rayed; pedicels short, simple or forked; bracts obsolete, a few large, linear. Perianth an inch long; segments all oblanceolate-spathulate. Stamens as long as the perianth.

Hab. Brazil; Province of Bahia, *Martius*.

20. *A. INODORA* Herb. Amaryll. 90, tab. 2, fig. 1. — Flowering stem 2–3 ft. long, its leaves thin, lanceolate or oblong, narrowed into a long winged petiole, reaching 3–4 in. long, an inch broad. Umbel simple, 2–6-flowered; pedicels 1–3 in. long; bracts many, large, lanceolate, thin. Perianth  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long; segments oblanceolate-unguiculate, the outer  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad, the inner narrower, plain or spotted towards the tip with claret-brown. Stamens as long as the segments.

Var. *A. NEMOROSA* Gardn. in Bot. Mag. t. 3958. — Leaves and bracts longer and thinner, the latter sometimes 3–4 in. long, 1– $1\frac{1}{4}$  in. broad, overtopping the flowers.

Hab. Widely spread in Central and Southern Brazil. Allied to *A. pulchella*, *hemantha*, and *aurantiaca*.

21. *A. PYGMÆA* Herb. Amaryll. 100, 397, tab. 8, figs. 4–13. — Underground stems 2–4 in. long. Stem not produced above the surface, bearing a dense tuft of ascending linear or lanceolate leaves  $\frac{1}{2}$ –1 in. long. Flower solitary, sessile in the centre of the tuft of leaves; segments oblanceolate-unguiculate, whitish, unspotted,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, 1–12th to 1–8th in. broad. Stamens nearly as long as the segments.

Hab. Andes of Pasco, Peru, *Mathews* 865! Gregory Bay, *Dr. Cunningham*! East Patagonia, *Capt. King*! Andes of Bolivia, alt. 11,000–12,000 ft., *Mandon* 1207!

22. *A. REVOLUTA* Ruiz et Pav. Fl. Peruv. iii. 59. — Flowering stem a foot or more. Leaves crowded, ascending, linear, the longest 1– $1\frac{1}{2}$  in. long. Umbel of 6–12 or more simple or forked short rays; bracts many, small, linear. Perianth purplish,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; segments oblanceolate-unguiculate, 1–12th to 1–8th in. broad, reflexing or spreading from the middle when expanded; inner

tinged with yellow and spotted. Stamens shorter than the segments; anthers very small.

Hab. Chili; Province of Colchagua, &c., *Pavon!* *Bridges* 1227! *C. Gay!*

23. *A. VERSICOLOR* Ruiz et Pav. Fl. Peruv. iii. 59. — Flowering stem in the type about  $\frac{1}{2}$  ft. long. Leaves many, linear, ascending, the lower about an inch long. Umbel of few simple forks; bracts few, linear. Perianth about an inch long; segments all oblanceolate-unguiculate, acute, yellow spotted with purple; outer  $\frac{1}{4}$  in. broad; inner narrower. Stamens about as long as the segments.

Var. *A. RECUMBENS* Herb. Amaryll. 97. — Stem scarcely at all produced above the surface of the ground. Umbel many-rayed; some of the pedicels forked.

Var. *A. CUMINGIANA* Herb. Amaryll. 96. — Stems  $\frac{1}{2}$ –1 ft. long. Leaves scattered, linear, about  $\frac{1}{2}$  in. long. Umbel 4–6-rayed, some or all of the pedicels forked. Perianth 1–1 $\frac{1}{4}$  in. long.

Hab. Chili, about Valparaiso, Conception, &c. I cannot, from the material at my command, separate specifically *A. tenuifolia* Herb., *A. nivalis* Meyen, *A. Kingii* Phil., *A. xanthina* Phil., *A. puberula* Phil., *A. tigrina* Phil., and *A. citrina* Phil.

24. *A. INCONSPICUA* Phil. Descr. Nuev. 1873, 70. — Flowering stem 6–9 in. long. Leaves crowded, linear-subulate, an inch long. Umbel 2–3-rayed; rays 1–7-flowered; flowers racemed, secund, small, purplish.

Hab. Chili; Province of Santiago, *Philippi*. Of a large proportion of the Chilian species recently described by Dr. Philippi I have not seen specimens.

25. *A. NIVALIS* Phil. in Linn. xxix. 69, non Meyen.—Flowering stem a span long. Leaves crowded, linear, under an inch long. Umbel of 3 simple rays. Perianth 1 $\frac{1}{2}$ –2 in. long; outer segments obovate-unguiculate,  $\frac{3}{4}$  in. broad; inner longer, narrower, the upper tinged with yellow at the middle and marked with oblique purple lines and spots.

Hab. Chili; Province of Santiago, near the snow-line, *Germain*. Allied to *A. Ligtu*.

26. *A. PAUPERCULA* Phil. Fl. Atac. 51, No. 371.—Flowering stem about 2 in. long. Leaves  $\frac{1}{4}$ – $\frac{1}{3}$  in. long, undulated at the edge. Umbel 2–3-flowered; pedicels simple or forked,  $\frac{1}{2}$  in. long. Perianth pale lilac; outer segments obovate-spathulate, emarginate, with a green mucro, under 1 $\frac{1}{2}$  in. long, under  $\frac{1}{2}$  in. broad; inner  $\frac{1}{4}$  in. longer, acuminate, with a green tip and a yellow base, inconspicuously spotted.

Hab. Atacama, on a desert coast mountain, called Mejillones, alt. 1200 ft., *Philippi*. Allied to *A. violacea*.

27. *A. ROSEA* Phil. Sert. Mendoc. alt. 43, non Hook.—Flowering stem 1 $\frac{1}{2}$  ft. long. Leaves regular, narrow linear, about  $\frac{1}{2}$  in. long. Umbel 5-rayed; branches about 3 in. long, usually 3-flowered. Perianth 1 $\frac{1}{2}$ –1 $\frac{3}{4}$  in. long; outer segments rose-red, obovate-spathulate, above  $\frac{1}{2}$  in. broad; inner narrower, yellow, spotted, with a rose-red cusp.

Hab. Mendoza, *Philippi*. Allied to *A. Ligtu*.

28. *A. ARAUCANA* Phil. Descr. Nuev. Plant. 1873, 71.—Flowering stem erect, densely leafy, under a foot long. Leaves linear, few-nerved, not resupinate,  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{6}$ – $\frac{1}{4}$  in. broad. Umbels few-rayed; rays mostly 2-flowered. Perianth-segments orange-yellow, nearly 2 in. long; outer ovate-spathulate, with a rounded apex; inner subrhomboid, acute.

Hab. Chili; Province of Araucania, *Volckmann*. Allied to *A. Ligtu*.

29. *A. VOLCKMANNI* Baker. *A. stenopetala* Phil. Descr. Nuev. Plant. 1873, 71, non Schenck. — Flowering stem 6–15 in. long. Leaves distant, small, linear-lanceolate, the largest  $\frac{3}{4}$  in. long. Umbel 2-rayed; rays 1–2-flowered. Perianth 2 in. long; outer segments oblanceolate-unguiculate,  $\frac{3}{8}$  in. broad; inner narrower, punctate.

Hab. Chili; Province of Araucania, *Volckmann*. Allied to *A. Ligtu*.

30. *A. VIOLACEA* Phil. Fl. Atac. 51, No. 370. — Leaves of the sterile stem ovate-oblong, petioled, 5-nerved, with a blade 2 in. long, nearly an inch broad. Flowering stem  $1\frac{1}{2}$  ft. long; leaves distant, scattered, erecto-patent, linear, under an inch long. Umbel 5-rayed; pedicels forked, 2–3 in. long; bracts about 6, small, ascending, linear. Perianth bright lilac,  $1\frac{1}{2}$ –2 in. long; outer segments obovate-unguiculate,  $\frac{3}{4}$  in. broad, truncate, with a small cusp; inner oblong, acute,  $\frac{1}{2}$  in. broad, with many small spots. Stamens much shorter than the segments.

Hab. Chili; Desert of Atacama, *Philippi*! Allied to *A. Ligtu*.

31. *A. LIGTU* Linn. Sp. Pl. 462 (Feuill. Obs. ii. 710, t. 4); Lindl. in Bot. Reg. 1839, t. 3. — Flowering stem  $1\frac{1}{2}$ –2 ft. long. Leaves 20–30, thin, ascending, linear or lanceolate, the largest 2–3 in. long,  $\frac{1}{4}$ – $\frac{1}{2}$  in. broad. Umbel 3–8-rayed; rays often forked, 2–3 in. long; bracts several, linear, 1– $1\frac{1}{2}$  in. long. Perianth about  $1\frac{1}{2}$  in. long; outer segments obovate-unguiculate, obtuse or cuspidate,  $\frac{1}{2}$  in. broad, whitish or pale lilac or pale red, obliquely streaked with purple; inner narrower and more acute. Stamens shorter than the segments.

Var. *A. PULCHRA* Sims in Bot. Mag. t. 2421. *A. bicolor* Hook. Exot. Flora, t. 65; Lodd. Bot. Cab. t. 1147. *A. Flos-Martini* Ker in Bot. Reg. t. 731; Sweet, Brit. Flow. Gard. ser. ii. t. 277. *A. bicolor* Lodd. Bot. Cab. t. 1497. — Leaves narrower and longer than in the type. Flowers as large, variously coloured, both the outer and inner segments cuspidate or acute.

Hab. Frequent in Chili, and often seen in cultivation in numerous forms. I cannot distinguish specifically *A. angustifolia* Herb., *A. Presliana* Kunth, *A. pallida* Graham in Bot. Mag. t. 3040, *A. Hookeriana* R. & S. (*A. rosea* Hook. Exot. Flora, t. 281; *A. Hookeri* Lodd. Bot. Cab. t. 1272), and *A. exserens* Meyen. The following species recently described by Dr. Philippi must also be near allies:—*A. flava*, *hirtella*, *Diazi*, *flava*, *pallens*, *inequalis*, and *chiloensis*.

32. *A. PARVULA* Philippi in Linn. xxxiii. 261.—Flowering stem not more than an inch long above the surface of the ground. Leaves crowded, subsulate, oblanceolate-spathulate, about  $\frac{1}{2}$  in. long,  $\frac{1}{8}$  in. broad. Umbel simple, about 5-flowered; pedicels  $\frac{1}{2}$  in. long; bracts resembling the proper leaves, as long as the pedicels.

Perianth rose-red, under an inch long; outer segments obovate-spathulate, nearly  $\frac{1}{2}$  in. broad; inner narrower, linear-oblong.

Hab. Chili; High Andes of Santiago and Aconcagua, *Philippi*.

33. *A. NUBIGENA* Philippi in Linn. xxix. 67. — Flowering stem about 4 in. long. Leaves oblanceolate-spathulate, 5-nerved, an inch long, under  $\frac{1}{4}$  in. broad. Umbel simple, 8-9-flowered; pedicels under an inch long. Perianth under an inch long; outer segments rose-red, with a green tip; inner red at the tip, yellow at the middle and dotted, whitish at the base. Stamens much shorter than the segments.

Hab. Chili; High Andes of the Province of Santiago, *Germain*.

34. *A. PHILIPPI* Baker. *A. violacea* Phil. Descr. Nuev. Plant. 1873, 72, non Fl. Atac. No. 370. — Flowering and sterile stems slender, decumbent, each about a foot long. Leaves of the sterile stem thin, oblong, glabrous, petioled, with a blade about an inch long, above  $\frac{1}{2}$  in. broad, those of the fertile stem lanceolate-spathulate,  $\frac{1}{6}$ - $\frac{1}{4}$  in. broad. Umbel 2-rayed; pedicels sometimes forked. Perianth bright violet,  $1\frac{1}{2}$ -2 in. long; outer segments oblong-unguiculate, obtuse,  $\frac{1}{2}$  in. broad; inner, narrower, acute, spotted. Stamens shorter than the segments.

Hab. Chili; 20 miles from Carrizal Bajo, *King*!

35. *A. PELEGRINA* Linn. Sp. Pl. 461 (Feuill. Obs. ii. t. 5); Bot. Mag. t. 139; Jacq. Hort. Vind. i. t. 50; iii. t. 73; Red. Lil. t. 46; Lodd. Bot. Cab. t. 1205. — Flowering stem stout,  $\frac{1}{2}$ -1 ft. long. Leaves about 30, thin, lanceolate, ascending,  $1\frac{1}{2}$ -2 in. long,  $\frac{1}{4}$ - $\frac{1}{2}$  in. broad. Umbel few-rayed and simple in the wild plant, but many-rayed and compound in cultivation; bracts similar in style to the leaves in shape and texture. Perianth lilac,  $1\frac{1}{2}$ -2 in. long; outer segments an inch broad, oblong-cordate with a large cusp: inner oblong-spathulate, cuspidate,  $\frac{1}{2}$  in. broad, copiously spotted with red-purple. Stamens declinate, much shorter than the segments.

Hab. Chili, near Valparaiso, &c., introduced into cultivation in 1753. There is a specimen from Lee's garden at Hammersmith in 1774 at the British Museum. *A. quillotensis* Herb. is a robust cultivated form. *A. alba* Hort. is a form with unspotted white flowers.

36. *A. GAYANA* Phil. in Linn. xxix. 71.—Flowering stem 2-3 ft. long. Leaves lanceolate, ciliated, not resupinate, the lower 3-4 in. long,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad, the upper growing gradually smaller. Umbel of about 8 forked rays 3 in. long; bracts lanceolate, an inch long. Perianth  $1\frac{3}{4}$  in. long, pale violet; outer segments obovate-emarginate, an inch broad; inner acute, the two upper  $\frac{1}{2}$  in. broad, flushed with yellow and punctate; lower with an almost orbicular blade  $\frac{5}{8}$  in. broad.

Hab. Chili, in shady places, *C. Gay*. Intermediate between *Pelegrina* and *hemantha*.

37. *A. HEMANTHA* Ruiz et Pav. Fl. Peruv. iii. 60; Sweet, Brit. Flow. Gard. ser. ii. t. 158; Regel, Gartenfl. t. 264. *A. pulchella* Sims in Bot. Mag. t. 2354; Hook. Exot. Flora, t. 64; Lindl. in Bot. Reg. t. 1008. *A. Simsi* Spreng.; Sweet in Brit. Flow. Gard. t. 267.—Flowering stem 2-3 ft. long. Leaves crow

lanceolate, subpetiolate, glaucous beneath, the lower 3-4 in. long,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad, the upper linear. Umbel very compound, many-flowered, with branches 4-6 in. long; bracts thin, lanceolate. Perianth  $1\frac{1}{2}$ -2 in. long; outer segments oblong spathulate, acute, bright red, tipped with green,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad; inner oblanceolate-unguiculate, with red-purple spots on a red-yellow ground. Stamens declinate, much shorter than the segments.

Hab. Chili. Common at the present day in European gardens. Var. *albida* Herb. is a form with whitish flowers.

38. *A. AURANTIACA* D. Don in Sweet Brit. Flow. Gard. ser. 2, t. 205; Lindl. in Bot. Reg. t. 1843. *A. aurea* Meyen; Hook. in Bot. Mag. t. 3350. — Flowering stem 2-4 ft. long. Leaves 40-50, thin, lanceolate, subpetiolate, rather glaucous below, the lower 3-4 in. long,  $\frac{1}{2}$  in. broad. Flowers 10-30 in an umbel with long compound rays; bracts like the leaves in size and shape. Perianth bright yellow,  $1\frac{1}{2}$ - $1\frac{3}{4}$  in. long; outer segments oblong-unguiculate, subobtusate, tipped with green,  $\frac{1}{2}$ - $\frac{5}{8}$  in. broad; inner narrower, deeper in colour, acute, copiously spotted with claret-brown. Stamens declinate, much shorter than the segments.

Hab. Chili. Common at the present time in European gardens. *A. mutabilis* Kunze is probably a form either of this or of *A. haemantha*, which are closely allied to one another. *A. concolor* Steud. is a form with pale unspotted flowers.

39. *A. VENUSTULA* Phil. in Linn. xxxiii. 260. — Flowering stem 2-3 in. long, densely leafy only at the apex. Leaves oblong-spathulate,  $\frac{1}{2}$  in. long, obtuse or subacute, thick in texture, shortly hispid all over both surfaces. Umbel simple, 3-4-flowered; pedicels very short. Perianth  $\frac{1}{2}$ - $\frac{5}{8}$  in. long; outer segments with an oblong blade  $\frac{1}{8}$  in. broad and a long slender claw; inner oblanceolate-unguiculate, acute, copiously spotted. Stamens as long as the segments.

Hab. Chili, *Philippi!*

40. *A. LINEATIFLORA* Ruiz et Pav. Fl. Peruv. iii. 60, t. 289.— Leaves thin, oblong-spathulate, acute, glabrous, 3-4 in. long,  $1-1\frac{1}{2}$  in. broad. Umbel with 3-5 rays reaching 6-8 in. long, bearing each 2-4 flowers; bracts about 6, like the leaves in shape and texture. Perianth lilac, 2 in. long; outer segments obovate-unguiculate, acute, an inch broad; inner oblong, acute, under  $\frac{1}{2}$  in. broad, much spotted. Stamens much shorter than the segments.

Hab. Chili, *Pavon!* (Herb. Mus. Brit.).

41. *A. CHORILLENENSIS* Herb. in Bot. Reg. 1843, Misc. No. 95. *A. lineatiflora* Lindl. in Bot. Reg. 1843, t. 58, non R. & P.— Flowering stem about a foot long. Leaves thin, oblong-spathulate, bright green, 2-3 in. long,  $\frac{3}{4}$  in. broad. Umbel 3-rayed, 8-10-flowered; bracts thin, oblong-spathulate. Perianth  $1\frac{1}{2}$  in. long; outer segments rose-red, obovate, slightly emarginate,  $\frac{1}{2}$  in. broad; inner acute,  $\frac{3}{8}$  in. broad, flushed with yellow at the middle and dotted. Stamens shorter than the segments.

Hab. Described from a plant cultivated at Chiswick, sent from Lima by Maclean.

42. *A. CROCEA* Phil. in Linn. xxxiii. 262.—Flowering stem  $\frac{1}{2}$  ft. long, closely leafy in the upper third. Leaves oblong, acute, firm in texture, about an inch long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad. Umbel simple, 2-flowered; pedicels short. Perianth yellow; outer segments obovate-unguiculate, obtuse,  $1\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. broad; inner  $\frac{1}{4}$  in. longer, narrower, acute. Stamens as long as the outer segments.

Hab. Chili, *Philippi*! Allied to *A. spathulata*.

43. *A. SPATHULATA* Presl, Rel. Haenk. ii. 122, tab. 22, fig. 2.—Flowering stem  $\frac{1}{2}$ –1 ft. long. Leaves crowded in the upper part of the stem, oblong-spathulate, thick in texture, glabrous, crisped and scarioso at the edge, subobtuse, 1–2 in. long,  $\frac{1}{4}$ – $\frac{3}{4}$  in. broad. Umbel simple, few-flowered; pedicels short. Perianth reddish, 1– $1\frac{1}{2}$  in. long; outer segments obovate-unguiculate, obtuse,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad; inner oblong-unguiculate, acute,  $\frac{1}{4}$  in. broad. Stamens usually shorter than the segments.

Hab. Andes of Chili and Mendoza, *Gillies*! *Bridges*! *C. Gay*! *A. sericantha* Schauer (*A. umbellata* Meyen) is probably a dwarf form of this species, and *A. Neillii* Hook. in Bot. Mag. t. 3105, a robust cultivated condition. *A. andina* Phil. in Linn. xxix. 69, seems to differ mainly by its smaller flowers, but we have a dwarf alpine form of *spathulata* from *C. Gay* with perianth only 7–8 lines long and stamens as long as the segments.

44. *A. CRISPATA* Phil. in Linn. xxix. 70.—Flowering stem 3–4 in. long, densely leafy only in the upper quarter. Leaves with a sub-orbicular very much crisped blade  $\frac{1}{6}$ – $\frac{1}{4}$  in. long and broad, and a long flat petiole. Flowers 6–12 in a simple umbel; pedicels  $\frac{1}{2}$ – $\frac{3}{4}$  in. long; bracts many, small, lanceolate. Perianth  $\frac{5}{8}$  in. long; segments obovate-unguiculate, obtuse, with a long claw and a small blade  $\frac{1}{8}$ – $\frac{1}{6}$  in. broad. Stamens a little longer than the segments.

Hab. Chili, *Philippi*! A very distinct and curious little species.

### 53. BOMAREA *Mirb.*

*Perianth* funnel-shaped; tube none; segments of each row uniform, but those of the two rows dissimilar, the three outer firmer in texture, oblanceolate-oblong, the three inner broadest at the point and narrowed to a distinct grooved claw. *Stamens* attached to the base of the segments, about equalling them; filaments filiform; anthers oblong, basifixed. *Ovary* 3-celled; ovules many, superposed; style filiform; stigma trifid. *Capsule* turbinate, truncate at the apex, 6-ribbed, finally dehiscing. *Seeds* subglobose, with a pulpy testa. — *Root-fibres* slender, often thickened towards the tip into large tubers. *Stems* usually elongated and sarmentose. *Leaves* usually resupinate, obscurely petioled, usually oblong, acute. *Umbels* simple or compound. *Inner segments* of the perianth equalling or exceeding the outer.

Subgenus SPILÆRINE. High mountain types with suberect stems, of which the leafy part is not more than  $\frac{1}{2}$  ft. long.

Leaves linear or lanceolate . . .	Sp. 1–8.
Leaves oblong or oblong-lanceolate . . .	Sp. 9–20.

Subgenus *WICHURÆA*. High mountain types with suberect stems, much decurved at the top, and crowded ascending non-resupinate leaves . . . . . Sp. 21-23.

Subgenus *BOMAREA* PROPER. Stems elongated, sarmentose. Leaves resupinate, usually oblong.

Perianth-segments equal. Umbel simple.

Flowers small . . . . . Sp. 24-29.

Flowers middle-sized . . . . . Sp. 30-42.

Flowers large . . . . . Sp. 43-51.

Perianth-segments equal. Umbel compound.

Flowers small . . . . . Sp. 52.

Flowers middle-sized . . . . . Sp. 53-56.

Flowers large . . . . . Sp. 57-63.

Inner perianth-segments distinctly longer than the outer. Umbel simple.

Flowers middle-sized . . . . . Sp. 64-65.

Flowers large . . . . . Sp. 66-71.

Inner perianth-segments distinctly longer than the outer. Umbel compound.

Flowers small . . . . . Sp. 72-73.

Flowers large . . . . . Sp. 74-75.

#### Subgenus *SPHÆRINE*.

1. *B. LINIFOLIA* Baker in Journ. Bot. 1882, 201. *Alstræmeria linifolia* H. B. K. *A. rosmarinifolia* Benth. *Sphærine linifolia* Kunth. — Stems slender, pubescent upwards, erect,  $\frac{1}{2}$ – $1\frac{1}{2}$  ft. long. Leaves linear or lanceolate, spreading,  $1$ – $1\frac{1}{2}$  in. long,  $\frac{1}{6}$ – $\frac{1}{3}$  in. broad, firm in texture, with strongly revolute edges, glaucous and glabrous beneath. Umbel simple, 3–6-flowered, bracteated by a whorl of lanceolate leaves; pedicels  $\frac{1}{2}$ – $1$  in. long, often bracteate. Ovary turbinate, densely pilose. Segments all  $\frac{1}{3}$ – $\frac{1}{2}$  in. long; outer much tinged with red; inner yellow, spotted.

Hab. High Andes of New Granada and Ecuador, 10,000–13,000 ft.

2. *B. LEHMANNI* Baker in Journ. Bot. 1883, 373. — Stems suberect, slender, glabrous, 2–3 ft. long. Leaves crowded, ascending, rigid, linear, with recurved edges, glaucous beneath, 3 in. long. Umbel erect, compound; bracts 6–8, similar to the leaves; rays 6–8, 4–5 in. long, 2–3-flowered, pubescent upwards; flower-bracts lanceolate, rigid,  $1$ – $1\frac{1}{2}$  in. long. Ovary hairy, obconic. Segments of both rows  $\frac{1}{2}$  in. long; outer dark red, pubescent externally; inner light red.

Hab. Andes of Candimarcá, alt. 10,000–11,000 ft., Lehmann 2420!

2 A B. *cruevia* Kränzl. (*Chacabambensis*)

3. *B. PHYLLOSTACHYA* Masters MSS. — Stems glabrous, erect. Leaves lax, linear, erecto-patent, rigid, with revolute edges, strongly ribbed and densely pilose beneath, 4–5 in. long. Umbel erect, compound; bracts few, just like the leaves; rays 4, 3–4 in. long, 2–3-flowered, with large bracts at the forks. Ovary small, obconic,

glabrous. Perianth-segments all  $\frac{3}{4}$ – $\frac{7}{8}$  in. long; outer tinged with red; inner greenish yellow, nearly  $\frac{1}{4}$  in. broad at the tip.

Hab. Andes of Columbia, *Lobb!*

4. *B. HISPIDA* Baker in Journ. Bot. 1882, 202. — Stems 1–2 ft. long, decumbent at the base, leaty in the upper half or third. Leaves moderately close, ascending, lanceolate, firm in texture,  $1\frac{1}{2}$ –2 in. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad, glaucous and densely hispid on the ribs beneath. Umbel erect; bracts large, lanceolate; rays 2–3, 1–2-flowered,  $1\frac{1}{2}$ –2 in. long, bracteate at the middle. Ovary small, turbinate, pubescent. Segments all  $\frac{1}{2}$ – $\frac{3}{8}$  in. long; outer tinged with red; inner yellow, tinged with red.

Hab. New Granada; Paramos of Ocana, 8000–10,000 ft., *Schlim* 486! *Goudot!* *Kalbreyer* 563!

5. *B. MINIMA* Baker in Journ. Bot. 1882, 202. — Stems slender,  $1\frac{1}{2}$  ft. long, decumbent at the base, leaty and hairy in the upper third. Leaves close, ascending, lanceolate, slightly hairy beneath, firm in texture, 1– $1\frac{3}{4}$  in. long; edges narrowly revolute. Umbel simple, 2-flowered; bracts large, lanceolate; pedicels  $1\frac{1}{2}$  in. long, with a lanceolate bract at the middle. Ovary hemispherical, glabrous. Segments all  $\frac{1}{2}$  in. long; outer tinged with red, narrowed in the lower half; inner rather shorter, greenish yellow, spotted.

Hab. New Granada; Paramo of Cuchero, *Purdie!*

6. *B. CHIMBORACENSIS* Baker in Engl. Jahrb. 1887, 212. — Stem short, suberect, glabrous, cernuous at the apex. Leaves crowded, ascending, lanceolate, rigid, glabrous, closely strongly ribbed, 2–3 in. long,  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad. Umbel dense, simple, 6–10 flowered; bracts 4–5, just like the leaves; pedicels slender, naked, under an inch long. Ovary turbinate, glabrous. Segments all  $\frac{5}{8}$  in. long; outer reddish; inner spatulate, yellowish green,  $\frac{1}{6}$  in. broad.

Hab. Ecuador; Paramos of Chimborazo, alt. 12,000 ft., *Lehmann!*

7. *B. BREVIS* Baker in Journ. Bot. 1882, 202. *Sphærine brevis* Herb.—Stems suberect, glabrous, leaty in the upper half. Leaves oblanceolate, acute, moderately firm in texture, 3–4 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad at the middle, glabrous beneath. Umbel simple, 3-flowered; bracts one large, the others small; pedicels an inch long, not bracteated. Ovary turbinate, pubescent. Segments all  $\frac{3}{8}$  in. long; outer oblanceolate-oblong, tinged with red, emarginate and connate below the tip.

Hab. Andes of Peru, *Mathews* 1660!

8. *B. NERVOSA* Baker in Journ. Bot. 1882, 202. *Sphærine nervosa* Herb.—Stems suberect, glabrous, leaty in the upper foot. Leaves lanceolate, firm in texture, acuminate, glaucous and glabrous beneath, 4–5 in. long, under an inch broad. Umbel simple, erect, 20–30-flowered; bracts 3, large, oblong-lanceolate; pedicels  $1\frac{1}{2}$  in. long, stiffly erect, pubescent, not bracteated. Ovary turbinate, pubescent. Segments all  $\frac{1}{2}$  in. long; outer linear-oblong; inner with a claw as long as the cuneate limb.

Hab. Andes of Peru, *Mathews* 1661!

9. *B. STENOPETALA* Baker in Engl. Bot. Jahrb. 1887, 212.—Stems slender, erect, glabrous, slightly flexuose, 2–3 ft. long. Leaves lax, erecto-patent, oblong-lanceolate, very acute, rigid, glabrous, strongly ribbed; lower 3–4 in. long,  $\frac{3}{4}$  in. broad. Umbel few-flowered, erect, simple or compound; bracts 2–3, large, linear or lanceolate; rays flexuose, 2–3 in. long, naked or bracteolate. Ovary obconic, glabrous. Perianth-segments all  $\frac{3}{4}$  in. long; outer dark lake-red; inner orange-red, with a long claw and small cuneate limb.

Hab. New Granada; Woods of Antioquia, alt. 8000–10,000 ft., *Lehmann!*

10. *B. PUMILA* Griseb. in Lechl. Pl. Peruv. Exsic. No. 2240.—Stems very slender, decumbent at the base, flexuose, leafy only in the top, 1–2 in. Leaves oblong, obtuse,  $\frac{3}{4}$ –1 $\frac{1}{4}$  in. long, thin, glaucous and glabrous beneath. Flower solitary, horizontal; pedicel densely pilose, under an inch long. Ovary turbinate, densely pilose. Perianth-segments equal in length, greenish yellow,  $\frac{1}{3}$  in. long; outer oblanceolate; inner cuneate.

Hab. Peru; Sachapata, *Lechler!*

10A *B. filicoides* Krnzl. (Huancayo, Peru)

11. *B. BRACHYSEPALA* Benth. Plant. Hartweg. 157.—Stems  $\frac{1}{2}$ –1 $\frac{1}{2}$  ft. long, decumbent at the base, glabrous, flexuose and leafy in the upper third. Leaves 6–8, oblong, firm in texture, obtuse, cuspidate, 1 $\frac{1}{2}$ –2 in. long, half as broad, glabrous beneath. Umbel 2–3-rayed; bracts 2–3, just like the leaves; pedicels 1–2 in. long, naked or minutely bracteate. Outer segments oblong,  $\frac{1}{2}$  in. long; inner  $\frac{3}{4}$  in. long, cuneate, with a long claw.

Hab. Andes of Peru; Loxa, *Hartweg* 855!

12. *B. SECUNDIFOLIA* Baker in Journ. Bot. 1882, 202. *Alstrameria secundifolia* Ruiz et Pav. Fl. Peruv. iii. 60, t. 290A. *Spharinea secundifolia* Herb.—Stems suberect, 2 ft. long, glabrous, leafy in the upper half. Leaves oblong-lanceolate, firm in texture, 3–4 in. long, an inch broad, strongly ribbed, glabrous beneath. Umbel simple; bracts small, lanceolate; pedicels pubescent, an inch long; Segments all  $\frac{3}{4}$ – $\frac{7}{8}$  in. long; outer reddish, externally pubescent; inner yellow, spotted.

Hab. Andes of Peru, near Muna, *Pavon!* (Herb. Mus. Brit.).

13. *B. RECURVA* Baker.—Stems slender, glabrous, 1–1 $\frac{1}{2}$  ft. long, leafy in the upper half, much recurved at the apex. Leaves oblong, acute, glabrous, moderately firm in texture, 3 in. long, an inch broad. Umbel simple, 2–3-flowered; one large bract; pedicels an inch long. Fruit glabrous, turbinate. Inner segments  $\frac{3}{4}$  in. long, obovate, with a narrow claw as long as the blade, yellowish green.

Hab. Andes of Peru; Sachapata, *Lechler* 2629!

14. *B. ANGUSTIPETALA* Baker in Journ. Bot. 1882, 202. *Spharinea angustipetala* Benth.—Stems slender, erect, glabrous, a foot long, leafy in the upper half. Leaves oblong-lanceolate, very acute, 1 $\frac{1}{2}$ –2 in. long, moderately firm in texture, hispid on the raised ribs beneath. Umbel simple, 4-rayed; bracts 5–6, large, lanceolate or oblong-lanceolate; pedicels about 3 in. long, with a lanceolate

bract at the middle. Ovary obconic, glabrous. Segments all  $\frac{3}{4}$ -1 in. long, oblanceolate,  $\frac{1}{8}$ - $\frac{1}{4}$  in. broad.

Hab. Andes of Bogota, alt. 9000 ft., *Hartweg*!

15. *B. DISTICHOPHYLLA* Baker in Journ. Bot. 1882, 202. *Alstræmeria distichophylla* Ruiz et Pav. Fl. Peruv. iii. 60, t. 287 A. *Sphærine distichophylla* Herb.—Stems suberect, glabrous,  $1\frac{1}{2}$ -2 ft. long, leafy in the upper half, not flexuose. Leaves lax, oblong, acute, moderately firm in texture, 2-3 in. long,  $\frac{3}{4}$ - $\frac{7}{8}$  in. broad, glaucous and slightly pilose beneath. Umbel simple; bracts 2, similar to the leaves; rays 3-6, slender, curved, glabrous, an inch long, not bracteate. Ovary turbinate, glabrous. Segments all  $\frac{1}{3}$ - $\frac{1}{2}$  in. long; outer bright red.

Hab. Peru; Andes of Muna, alt. 10,000-11,000 ft., *Pavon*! *Pearce* 159!

16. *B. PODOPETALA* Baker in Journ. Bot. 1882, 202. —Stems suberect, glabrous,  $1$ - $1\frac{1}{2}$  in. long, very flexuose in the leafy upper half. Leaves lax, oblong, rigid, glabrous,  $2$ - $2\frac{1}{2}$  in. long, under an inch broad, glaucous beneath. Umbel simple, 2-3-flowered; bracts 2-3, large, oblong; pedicels slender, curved, 2-3 in. long. Ovary very small. Outer segments oblong, reddish,  $\frac{3}{8}$  in. long; inner  $\frac{3}{4}$  in. long, cuneate, with a long claw.

Hab. Andes of Southern Ecuador, alt. 9000-10,000 ft., *André* 4611 bis!

16. *B. POLYGONATOIDES* Baker in Journ. Bot. 1882, 202.—Stems suberect, glabrous, above a foot long, not flexuose in the leafy upper half. Leaves 12-15, lax, ascending, oblong, acute, firm in texture, 2-3 in. long,  $\frac{3}{4}$ -1 in. broad. Umbel simple, 2-flowered; pedicels  $\frac{1}{2}$  in. long. Ovary small, glabrous. Segments all  $\frac{1}{4}$  in. long, bright yellow.

Hab. Andes of Southern Ecuador, alt. 9000-10,000 ft., *André*!

18. *B. COCCINEA* Baker in Journ. Bot. 1882, 202. *Alstræmeria coccinea* Ruiz et Pav. Fl. Peruv. iii. 62, tab. 291, fig. a. *Sphærine coccinea* Herb.—Stems about 3 ft. long, pilose, flexuose and leaty in the upper half. Leaves oblong, acute, 3 in. long,  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. broad at the middle, pilose beneath. Umbels simple; bracts suppressed; rays 2-4, pilose,  $2$ - $2\frac{1}{2}$  in. long. Ovary turbinate, pubescent. Segments all about  $\frac{1}{2}$  in. long; outer bright red; inner greenish yellow, spotted.

Hab. Andes of Peru, *Ruiz & Pavon*. This I have not seen.

19. *B. HARTWEGII* Baker in Journ. Bot. 1882, 203. *B. simplex* Benth. Pl. Hartweg. 156, non Herb.—Stems suberect, 1-2 ft. long, leaty, densely pubescent and flexuose in the upper half. Leaves lax, petioled, oblong, acute, rounded at the base, 2-3 in. long, moderately firm in texture, strongly nerved and densely pubescent beneath. Umbel simple, 4-8-flowered; bracts suppressed or 2, like the leaves; pedicels curved, densely pilose,  $1$ - $1\frac{1}{2}$  in. long, not bracteolate. Perianth-segments red, equal in length,  $\frac{3}{4}$  in. long; outer oblanceolate; inner with a small blade and long claw.

Hab. Peru; Cordilleras of Loxa, *Hartweg*! South Ecuador, alt. 9000-10,000 ft., *André*!

20. *B. DISSITIFOLIA* Baker in Journ. Bot. 1882, 203. — Stems suberect, 1–1½ ft. long, straight, leaty in the upper half. Leaves lax, oblong-lanceolate, acute, 2–3 in. long, firm in texture, green and glabrous beneath, with about 40 close raised veins. Flowers 6–8 in a simple umbel; bracts minute, lanceolate; pedicels curved, densely pubescent, not bracteolate, 1–1½ in. long. Perianth-segments equal in length, ¾ in. long; outer oblanceolate, orange-red; inner narrowly obovate-unguiculate, spotted with violet.

Hab. Andes of South Ecuador, alt. 9000 ft., André!

20A *B. squamulosa* Kvanzl. (Colombia or Ecuador)

Subgenus WICHURÆA.

21. *B. GLAUDESCENS* Baker in Journ. Bot. 1882, 201. *Alstræmeria glaucescens* H. B. K. *Collania glaucescens* Herb. *Wichuræa glaucescens* Roem.—Stems 1–2 ft. long, stiffly erect, decurved at the apex. Leaves rigid, linear, with very revolute edges, very ascending, 1–2 in. long. Umbel simple, 3–6-flowered; pedicels about ½ in. long; bracts rigid, lanceolate, an inch long. Ovary glabrous. Perianth ¾ in. long; segments equal in length; outer tinged with red; inner spotted with claret-red.

Var. *DULCIS* Baker. *Alstræmeria dulcis* Hook. Bot. Musc. ii. 237, t. 95. *Collania dulcis* Herb.; Lindl. in Bot. Reg. 1837, t. 34. *Wichuræa dulcis* Roem.—A depauperated form, with slender less rigid stems, smaller leaves and bracts, and only 1–2 flowers.

Var. *PUBERULA* Baker. *Collania puberula* Herb. *Wichuræa puberula* Roem.—Umbel much laxer, many-flowered, compound, with pedicels 2–3 in. long, with a large lanceolate bract at the fork. Flowers larger.

Hab. High Andes of Ecuador, Bolivia and Peru, ascending to 13,000 ft. on Pichincha and 14,000 on Sorata. *Collania nutans* Herbert MSS. is a form with an elongated slender sarmentose stem.

22. *B. ANDIMARCANA* Baker in Journ. Bot. 1882, 201. *Collania andimarcana* Herb.; Hook. in Bot. Mag. t. 4247. *Wichuræa andimarcana* Roem.—Stems stout, suberect, glabrous or pubescent, much decurved at the top. Leaves crowded, sessile, erecto-patent, glossy, lanceolate, moderately firm in texture, 3–5 in. long, ¼–½ in. broad, glaucous and pubescent beneath. Umbel of few simple or forked rays about an inch long; bracts like the leaves or broader. Perianth 1¾–2 in. long; segments equal in length; outer linear-oblong, much tinged with red; inner yellowish green, ⅓–½ in. broad at the tip. Stamens exerted.

Hab. High Andes of Peru, Mathews 1164! Maclean! The plant figured in the 'Botanical Magazine,' which was flowered by Messrs. Veitch in 1846, from seeds collected by Lobb, has a lax umbel, with pedicels 3–4 in. long, with large bracts at the fork.

23. *B. INVOLUCROSA* Baker in Journ. Bot. 1882, 201. *Collania involucrosa* Herb. Amaryll. 103, t. 9. *Wichuræa involucrosa* Roem.—Stems stout, suberect, 3–4 ft. long, very cernuous at the apex. Leaves crowded, ascending, linear, with revolute edges, firm in texture, erecto-patent, 4–5 in. long, glaucous and densely pilose beneath. Flowers 6–20 in a dense simple umbel, surrounded by

numerous oblong glossy bracts  $1\frac{1}{2}$ –2 in. long; pedicels very short. Perianth 2 in. long; all the segments oblanceolate,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad.

Hab. High Andes of Peru and Bolivia.

23. *B. macrocephala* Pax (Ayacucho)

23C *B. macranthera* Kraenzl.

23B *B. Firibga* Kraenzl. (Bolivia)

23D *B. stans* Kraenzl. (Bolivia)

Subgenus BOMAREA proper.

24. *B. TORTA* Herb. Amaryll. 115. *Alstrameria torta* H. B. K. *B. cumbrensis* Herb. — Stems elongated, slender, sarmentose, glabrous. Leaves crowded upwards, linear or lanceolate,  $1\frac{1}{2}$ –2 in. long, moderately firm in texture, glabrous beneath. Flowers 6–10 in a simple umbel; bracts large, lanceolate, pedicels very slender,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Ovary hemispherical, glabrous. Perianth-segments equal in length,  $\frac{3}{8}$ – $\frac{3}{4}$  in. long; outer oblanceolate, tinged red; inner cuneate-unguiculate, yellowish green, spotted.

Hab. Andes of Ecuador and Peru, gathered by Humboldt, Jameson, and Mathews.

24A *B. Engleriana* Kraenzl. (Huancayo, Peru)

24B *B. isopetalata* Kraenzl.

25. *B. UNCIFOLIA* Herb. in Bot. Reg. 1842, Musc. No. 88. *B. platypetala* Benth. Stems slender, glabrous, elongated, sarmentose. Leaves lax, linear or lanceolate, 2–3 in. long, moderately firm in texture, glabrous and glaucous beneath. Flowers 4–10 in a simple umbel; bracts several, large, lanceolate; pedicels slender, 1–2 in. long, not bracteolate. Perianth-segments equal in length,  $\frac{3}{4}$  in. long; outer oblong; inner cuneate-unguiculate, with a blade  $\frac{1}{4}$  in. broad.

Hab. Andes of Ecuador, ascending to 12,000 ft. Gathered by Jameson, Hartweg, Spruce, and André.

26. *B. ANGUSTIFOLIA* Benth. Pl. Hartweg, 156. — Stems elongated, sarmentose, strongly angled, glabrous. Leaves spreading, lanceolate, 3–4 in. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad, moderately firm in texture, green, glabrous and closely ribbed beneath. Flowers 20–30 in a simple umbel; bracts many, just like the leaves; pedicels 1–2 in. long, very slender, glabrous, not bracteolate. Perianth-segments equal in length,  $\frac{3}{4}$  in. long; outer oblanceolate; inner with a small blade and very long claw.

Hab. Peru; Cordilleras of Loxa, Hartweg 853!

27. *B. GLOMERATA* Herb. Amaryll. 115, tab. 15, fig. 1. — Stems elongated, slender, sarmentose, pubescent upwards. Leaves lax, oblong-lanceolate, 2–3 in. long, moderately firm in texture, glabrous or pubescent beneath. Flowers a dozen or more in a dense simple umbel; bracts minute, linear; pedicels slender, downy,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Ovary pilose. Perianth-segments equal in length,  $\frac{1}{2}$  in. long; outer oblanceolate; inner oblanceolate-unguiculate.

Hab. Andes of Columbia and Peru, Mathews 1662! Lobb 256!

27A *B. sclerophylla* Kraenzl. (Huancayo, Peru)

28. *B. PACHYPHLEBIA* Baker in Journ. Bot. 1882, 204. — Stems elongated, sarmentose, glabrous. Leaves lax, shortly petioled, oblong-lanceolate, acute, firm in texture, 2–2 $\frac{1}{2}$  in. long,  $\frac{1}{2}$ – $\frac{5}{8}$  in. broad, obscurely pilose beneath, with about 40 crowded raised veins. Umbel simple, 6–8-flowered; bracts small, lanceolate; pedicels densely pubescent, ebracteolate, under an inch long.

Perianth-segments equal in length,  $\frac{3}{8}$  in. long; outer oblanceolate, tinged with red; inner cuneate-unguiculate, yellow.

Hab. Andes of Southern Ecuador, alt. 10,000 ft., *André!* Allied to *B. tomentosa*.

29. *B. TOMENTOSA* Herb Amaryll. 117. *Alstræmeria tomentosa* Ruiz et Pav. Fl. Peruv. iii. 62, t. 293 B. *B. setacea* Herb. *Alstræmeria setacea* Ruiz et Pav. Fl. Peruv. t. 262 B. *B. densiflora* Herb.; Bot. Mag. t. 5531.—Stems elongated, sarmentose, pubescent. Leaves lax, petioled, oblong, acute, 2-4 in. long, moderately firm in texture, densely pubescent beneath. Umbel simple, dense, many-flowered; bracts many, small, lanceolate; pedicels 1-2 in. long, pubescent, not bracteolate. Perianth-segments equal,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long; outer oblanceolate, tinged with red; inner cuneate-unguiculate, yellow.

Hab. Andes of New Granada, Ecuador and Peru, 6000-11,000 ft. Introduced into cultivation in 1865 by Messrs. Veitch.

30. *B. LANCIFOLIA* Baker in Journ. Bot. 1882. 202.—Stems elongated, stout, sarmentose, finely pubescent. Leaves lax, ascending, lanceolate, acuminate, 3-4 in. long,  $\frac{1}{3}$ - $\frac{1}{2}$  in. broad low down, green and glabrous on both surfaces. Flowers 30-40 in a simple umbel; bracts small, lanceolate; pedicels ebracteolate, about an inch long, Ovary turbinate, pubescent. Perianth-segments equal in length,  $\frac{3}{4}$ - $\frac{7}{8}$  in. long; outer oblanceolate, tinged with red; inner golden yellow, with a long distinct claw.

Hab. Andes of Quito, alt. 6000-9000 ft., *André!*

304 *B. subincensis* (Cav.) Baker (Cv. 1882)   
 31. *B. CERNUA* Griseb. in Plant. Lechler, No. 2597.—Stems elongated, very slender, sarmentose, finely pubescent. Leaves lax, lanceolate,  $1\frac{1}{2}$ -2 in. long,  $\frac{1}{2}$  in. broad, thin in texture, glaucous and pubescent beneath. Flowers 3-4 in a simple umbel, very cernuous; bracts 3-4, just like the leaves; pedicels 1-1 $\frac{1}{2}$  in. long, densely pubescent, not bracteolate. Ovary hemispherical, densely pubescent. Perianth-segments equal in length, an inch long; outer oblanceolate-spathulate; inner obovate-unguiculate,  $\frac{1}{3}$  in. broad.

Hab. Peru; Andes of Sachapata, *Lechler!*

32. *B. FIMBRIATA* Herb. Amaryll. 116. *Alstræmeria fimbriata* Ruiz et Pav. Fl. Peruv. iii. 63, t. 293 A.—Stems elongated, sarmentose, glabrous. Leaves lax, lanceolate, 3-5 in. long,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad, firm in texture, closely ribbed, glabrous or slightly pubescent beneath. Flowers many in a dense simple umbel; bracts small, lanceolate; pedicels 1-1 $\frac{1}{4}$  in. long, pubescent, not bracteolate. Perianth-segments about equal in length, an inch long; outer dark-coloured, oblanceolate-spathulate; inner obovate-unguiculate,  $\frac{1}{3}$  in. broad, yellow, copiously spotted.

Hab. Andes of Peru and Bolivia, *Mathews* 867! *Mandon* 1202! I cannot distinguish specifically *B. subglobosa*, *floribunda* and *anceps* Herb.

33. *B. STENOPETALA* Baker.—Stems elongated, sarmentose, acutely angled, pubescent. Leaves lax, petioled, oblong, acute, 3-4 in. long, about an inch broad, very thick and rigid in texture, densely pubescent on the thick crowded veins beneath. Flowers

many in a dense simple umbel; bracts minute; pedicels densely pubescent, 1-1½ in. long, not bracteolate. Perianth-segments equal in length, an inch long; outer oblanceolate, red-brown; inner bright yellow, oblanceolate-unguiculate, under ¼ in. broad.

Hab. Andes of New Granada; Ocana and Cauca. *Kalbreyer!* *Lehmann* 2783!

34. *B. CRASSIFOLIA* Baker.—Stems elongated, sarmentose, very flexuose, persistent, shortly pubescent. Leaves lax, lanceolate, 2-3 in. long, ½-¾ in. broad, very thick, rigid, pubescent beneath, strongly ribbed. Flowers 12-15 in a simple umbel; bracts minute, linear; pedicels an inch long, densely pubescent, not bracteolate. Ovary small, pubescent. Perianth-segments equal in length, under an inch long; outer oblanceolate, red-brown; inner cuneate-unguiculate, ½ in. broad, yellowish green, spotted.

Hab. New Granada; Andes of Antioquia, alt. 8000-9000 ft., *Lehmann!* Near *B. fimbriata* Herb.

35. *B. HALLIANA* Herb. Amaryll. 112, tab. 10, fig. 3.—Stems elongated, slender, sarmentose, glabrous. Leaves lax, petioled, lanceolate, 3-4 in. long, ¾ in. broad, thin in texture, distantly ciliated on the ribs beneath. Flowers about 6 in a simple umbel; bracts small; pedicels 1-1½ in. long, pubescent, not bracteolate. Ovary densely pubescent. Perianth-segments equal in length, an inch long; outer oblanceolate; inner cuneate-unguiculate, yellow, spotted with claret-brown, ⅓ in. broad.

Hab. Andes of Ecuador; Patatecha, *Col. Hall!*

36. *B. AURANTIACA* Herb. Amaryll. 399, t. 46, fig. 1. *B. Macleanica* Herb.—Stems stout, elongated, sarmentose, densely pubescent. Leaves lax, oblong, acute, 3-4 in. long, 1-½ in. broad, densely matted with grey pubescence beneath. Flowers very numerous, arranged in a dense globose umbel; bracts small, numerous; pedicels 1½-2 in. long, pubescent, not bracteolate. Perianth-segments equal in length, an inch long; outer brownish, oblanceolate-spathulate; inner obovate-unguiculate, bright yellow, not spotted, ½ in. broad.

Hab. Andes of Peru and Bolivia, *Mathews* 1160! *Mandon* 1203!

37. *B. ANGULATA* Benth. Pl. Hartweg, 156.—Stems elongated, sarmentose, glabrous, acutely angled. Leaves lax, petioled, oblong, acute, 3-4 in. long, 1-1½ in. broad, moderately firm in texture, glaucous and slightly pubescent beneath. Flowers about 20 in a simple umbel; bracts many, large oblong, leaf-like; pedicels 1-1½ in. long, glabrous, not bracteolate. Ovary glabrous. Perianth-segments equal in length, an inch long; outer oblanceolate; inner a little longer, obovate-unguiculate, ⅓ in. broad.

Hab. Peru; Andes of Loxa, *Hartweg!* Very near *B. multiflora* Mirbel.

38. *B. MULTIFLORA* Mirb. in Roem. Amaryll. 276. *Alstræmeria multiflora* Linn. fil. *B. Bredemeyeriana* Herb.; *Flore des Serres*, t. 2316. *A. Bredemeyeriana* Willd. *B. Fanningiana* Herb.—Stems elongated, sarmentose, finely pubescent. Leaves lax, petioled, oblong, acute, 3-4 in. long, thin in texture, glabrous or pubescent

beneath. Flowers 20-40 in a dense simple umbel; bracts many, oblong, foliaceous; pedicels  $\frac{3}{4}$ -1 in. long, pubescent, not bracteolate. Perianth-segments nearly equal in length; outer oblanceolate, an inch long, tinged with red; inner a little longer, obovate-unguiculate,  $\frac{1}{2}$  in. broad, reddish yellow, copiously spotted with claret-brown.

Hab. Mountains of Venezuela and New Granada. Description mainly taken from the original specimen gathered by Mutis, in the Linnean Herbarium.

38A B. *trachypetala* Ruiz & Pav. (Bolivia)  
 39. *B. CORNIGERA*, Herb. Amaryll. 110, tab. 17, fig. 2.—Stems very slender, elongated, sarmentose, glabrous. Leaves lax, petioled, oblong-lanceolate,  $1\frac{1}{2}$ -2 in. long,  $\frac{1}{2}$  in. broad, thin in texture, glabrous beneath. Flowers 1-3 in a simple umbel; bracts unequal, sometimes large; pedicels  $1\frac{1}{2}$  in. long, with small bracteoles near the base. Perianth-segments equal in length, an inch long; outer oblong-spathulate, emarginate, with a distinct apical spur; inner obovate-unguiculate.

Hab. Andes of Peru, *Mathews* 1659!

40. *B. ROSEA* Herb. Amaryll. 118. *Alstrameria rosea* Ruiz. et Pav. *B. variabilis* Herb. *B. simplex* Herb. in Bot. Mag, t. 3863.—Stems elongated, sarmentose, glabrous. Leaves lax, petioled, oblong, acute, 3-4 in. long, thin in texture, glaucous and pubescent beneath. Umbel usually simple; flowers few or many; bracts small; pedicels slender, glabrous,  $1\frac{1}{2}$ -2 in. long, often bracteolate at the middle. Perianth-segments equal, an inch long; outer oblanceolate, pale red tipped with green; inner obovate-unguiculate, greenish yellow, spotted.

Hab. Andes of Peru, Bolivia and Tucuman. Herbert's two varieties, placed under *B. purpurea*, are apparently many-flowered forms of this species.

41. *B. OLIGANTHA* Baker in Gard. Chron. 1877, ii. 648.—Stems slender, elongated, sarmentose, glabrous. Leaves lax, oblong, acute, 3-4 in. long, thin in texture, densely pubescent beneath. Flowers 6-8 in a simple umbel; bracts large, foliaceous; pedicels pubescent, 1- $1\frac{1}{2}$  in. long, often bracteolate. Ovary densely pubescent. Perianth segments equal in length, 1- $1\frac{1}{4}$  in. long; outer oblanceolate, dull red outside; inner cuneate-unguiculate,  $\frac{1}{3}$  in. broad, bright yellow, with claret-brown spots.

Hab. Andes of Peru; introduced by Leichlin in 1877. The specimens from which the original description was made are very poor and weak.

42. *B. PURPUREA* Herb. Amaryll. 118. *Alstrameria purpurea* Ruiz et Pav. Fl. Peruv. iii. 63, t. 294 A.—Stems elongated, sarmentose, pubescent. Leaves lax, oblong-lanceolate, acute, 3-4 in. long, an inch broad, pubescent beneath. Flowers 20-60 in a dense simple umbel; bracts small, linear-lanceolate; pedicels  $1\frac{1}{2}$  in. long, often furnished with a small lanceolate bracteole at the middle. Perianth-segments equal, purple, an inch long; outer oblanceolate; inner obovate-unguiculate.

Hab. Woods of the Peruvian Andes, *Pavon*!

43. *B. MULTIPES* Benth. Pl. Hartweg, 156.—Stems elongated, sarmentose, glabrous. Leaves lax, lanceolate, acuminate, 4-5 in. long,  $\frac{3}{4}$  in. broad, moderately firm in texture, glabrous beneath.

Flowers 40–50 in a lax irregular simple umbel; outer bracts large, leafy; pedicels 3–4 in. long, glabrous, not bracteolate. Ovary glabrous. Perianth-segments equal in length,  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. long; outer oblanceolate, tinged with red, scarcely  $\frac{1}{4}$  in. broad; inner rather longer, obovate, with a very long narrow claw.

Hab. Andes of Peru, *Hartweg* 854!

43A B. *Stuebelii* Poe (Bogotau, Peru)

44. *B. CRINITA* Herb. Amaryll. 119, t. 15, fig. 4. — Stems elongated, sarmentose, finely pubescent. — Leaves distinctly petioled, lanceolate, acuminate, 3–4 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad, firm in texture, glaucous and slightly pubescent beneath. Flowers 6–10 in a simple umbel; bracts large, lanceolate; pedicels 5–6 in. long, densely pubescent, not bracteolate. Ovary turbinate, densely pubescent. Perianth-segments equal in length,  $1\frac{3}{4}$  in. long; outer oblanceolate-spathulate,  $\frac{1}{3}$  in. broad; inner oblong, with a claw as long as the blade.

Hab. Andes of Peru, *Mathews* 1664!

45. *B. GONIOCAULON* Baker in Journ. Bot. 1882, 204. — Stems elongated, sarmentose, stout, acutely angled. Leaves lax, sessile, lanceolate, acuminate, moderately firm in texture, 4–6 in. long,  $\frac{3}{4}$ – $\frac{1}{2}$  in. broad low down, green and glabrous beneath. Flowers 30 or more in a simple umbel; bracts numerous, unequal, lanceolate, foliaceous; pedicels 2–3 in. long, not bracteolate. Perianth-segments equal in length,  $1\frac{3}{4}$ –2 in. long; outer oblong, lanceolate, acute, red towards the base, green at the tip; inner obovate-unguiculate, greenish, spotted with violet.

Hab. Mount Corazon, Andes of Quito, alt. 8000 ft., *André* 3646!

46. *B. CROCEA* Herb. Amaryll. 119. *Alstrameria crocea* Ruiz et Pav. Fl. Peruv. iii. 61. — Stems elongated, sarmentose, glabrous. Leaves linear, lanceolate, very acute, 4–5 in. long,  $\frac{1}{3}$  in. broad, pubescent beneath. Flowers many, arranged in a simple umbel; bracts oblong-lanceolate, 1– $1\frac{1}{2}$  in. long; pedicels pubescent, purplish. Perianth-segments equal in length,  $1\frac{1}{2}$  in. long; inner segments crocus-yellow.

Hab. Andes of Peru, *Pavon* (not seen).

46A B. *Sanaoquina* Kellaz! (Cuzco, Peru) 46 B. *Saluyana* Jodice (Cuzco)

47. *B. ACUMINATA* Baker in Engl. Jahrb. 1887, 212. — Stems slender, elongated, sarmentose, glabrous. Leaves lax, petioled, oblong-lanceolate, acuminate, 4–5 in. long, an inch broad, moderately firm in texture, glabrous beneath. Flowers 4–5 in a very lax simple umbel; bracts small, lanceolate; pedicels 2–3 in. long, with a small lanceolate bracteole at the middle. Perianth-segments equal in length,  $1\frac{3}{4}$  in. long; outer oblanceolate,  $\frac{1}{3}$  in. broad; inner not much broader, yellow, with purple spots.

Hab. New Granada; Province of Antioquia, alt. 5000–6000 ft. *Lehmann*!

48. *B. LONGIPES* Baker in Journ. Bot. 188, 204. — Stems elongated, sarmentose, glabrous. Leaves lax, distinctly petioled, oblong, acute, rounded at the base, 4–5 in. long,  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. broad low down, moderately firm in texture, shortly pubescent beneath. Flowers about 8 in a lax simple umbel; bracts few, unequal, one large and leaf-like; pedicels 5–6 in. long, obscurely bracteolate.

Perianth-segments equal in length, 15–16 lines long; outer oblanceolate, purplish,  $\frac{1}{3}$  in. broad, inner not much broader, yellowish.

Hab. Andes of South Ecuador, alt. 9000 ft. *André*, 4614!

49. *B. SUPERBA* Herb. Amaryll. 117, tab. 6, fig. 1. — Stems elongated, sarmentose, glabrous. Leaves lax, spreading, lanceolate, 4–5 in. long,  $\frac{3}{4}$  in. broad, moderately firm in texture, green and glabrous beneath. Flowers 40–50 in a dense simple umbel; outer bracts large, leaty; pedicels pubescent, 1–1 $\frac{1}{2}$  in. long, not bracteolate. Ovary densely pubescent. Perianth-segments equal in length, 1 $\frac{3}{4}$  in. long; outer oblanceolate-spathulate,  $\frac{1}{3}$  in. broader; inner unguiculate, scarcely broader.

Hab. Andes of Peru; Province of Chacapoyas, *Mathews* 1663!

50. *B. FORMOSISSIMA* Griseb. in Pl. Lechl. No. 2141, non Herb. *Alstrameria formosissima* Ruiz et Pav. Fl. Peruv. t. 296. — Stems stout, elongated, sarmentose. Leaves lax, oblong, acute, distinctly petioled, 4–5 in. long, 1–1 $\frac{3}{4}$  in. broad, glabrous beneath. Flowers very numerous, arranged in a dense simple umbel; bracts large, foliaceous; pedicels 1 $\frac{1}{2}$ –2 in. long, pubescent, not bracteolate. Perianth-segments equal in length, 1 $\frac{1}{2}$  in. long; outer oblanceolate, reddish; inner a little longer, twice as broad, cuneate-unguiculate, yellow.

Hab. Andes of Peru, *Pavon*! The above description is from Pavon's type-specimen. Lechler's 2141 differs by its lanceolate leaves, and agrees with Herbert's description of *B. Turneriana* from Santa Fé de Bogota. Columbian specimens from Lobb and Bolivian from Pearce agree substantially with Pavon's.

51. *B. VESTITA* Baker in Engl. Jahrb. 1887, 213. — Stems elongated, sarmentose, very stout, acutely angled, pubescent. Leaves lax, distinctly petioled, oblong, acute, 5–6 in. long, 1 $\frac{1}{2}$  in. broad, firm in texture, pubescent beneath. Flowers very numerous, arranged in a dense simple umbel 4–5 in. diam.; bracts about 8, oblanceolate, resembling the outer perianth-segments in shape and texture; pedicels pubescent, an inch long, not bracteolate. Perianth-segments equal in length, 1 $\frac{1}{4}$  in. long; outer oblanceolate; inner obovate-unguiculate,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad, yellowish red, not spotted.

Hab. New Granada; Paramo of Ruiz, Antioquia, 8000–10,000 ft., *Lehmann*!

51A *B. weberbaueriana* Kränzl. (*Sandia*, Peru)

52. *B. SALSILLA* Herb. Amaryll. 110. *Alstrameria Salsilla* Linn., non Gawl. *A. oculata* Lodd. Bot. Cab. t. 1851; Bot. Mag. t. 3341. — Stems elongated, sarmentose, slender, glabrous. Leaves lax, spreading, petioled, lanceolate or oblong-lanceolate, 2–4 in. long,  $\frac{1}{2}$ –1 in. broad, moderately firm in texture, glabrous beneath. Umbel 4–15-rayed, compound; bracts small; rays 1–3 in. long, 1–3-flowered; bracteoles small, lanceolate; lower pedicels ascending,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Ovary turbinate, glabrous. Perianth-segments equal in length,  $\frac{1}{2}$  in. long, all mauve-purple; outer oblanceolate-spathulate; inner broader, obovate-unguiculate, with a horse-shoe shaped dark zone at the base of the blade.

Hab. Chili, near Valparaiso, &c. Received alive recently from Mr. Wilson Saunders and Herr Leichtlin. Lechler's plant, named "*B. multiflora*, n. sp." by Grisebach, is not Mirbel's *multiflora*, but a form of this species.

52A *B. farmensis* Kränzl. (*Junin*, Peru)

53. *B. PARVIFOLIA* Baker. — Stems elongated, sarmentose, pubescent. Leaves sessile, linear, glabrous, 1-1½ in. long, ¼ in. broad, moderately firm in texture. Umbel of 10-12 2-3-flowered rays 3-4 in. long; bracts many, just like the leaves; lower pedicels ascending, 1-1½ in. long; bracteoles nearly as large as the bract. Ovary turbinate, glabrous. Perianth-segments equal in length, 1¼ in. long; both rows oblanceolate, bright pink, with a dark purple tip. Stamens and style exerted.

Hab. Andes of Peru, *Maclean!*

54. *B. HOOKERIANA* Herb. Amaryll. 398, tab. 46, fig. 2. — Stems elongated, sarmentose, pubescent. Leaves lax, distinctly petioled, oblong, acute, 5-6 in. long, under 2 in. broad, firm in texture, strongly ribbed and pubescent beneath. Umbel very dense; bracts minute; rays very numerous, 2 in. long, densely pubescent, 1-2-flowered. Ovary densely pubescent. Perianth-segments equal in length, under an inch long; outer oblanceolate, ¼ in. broader; inner not broader, oblanceolate-unguiculate.

Hab. Andes of Peru; Province of Chacapoyas, *Mathews!*

55. *B. ACUTIFOLIA* Herb. Amaryll. 112. *Alstræmeria acutifolia* Link & Otto, Ic. i. 5, t. 29; Bot. Mag. t. 3050, 3871, 6444; Sweet, Brit. Flow. Gard. ser. 2, t. 77. — Habit and leaves of *B. edulis*, from which it differs by its short simple or at most 2-flowered peduncles and more brightly-coloured (yellow) inner perianth-segments.

Hab. Mexico and Guatemala, ascending to 10,000 ft. on the Peak of Orizaba. Received alive lately from Mr. Elwes. Intermediate between *B. edulis* and *multiflora*.

56. *B. EDULIS* Herb. Amaryll. 111. *Alstræmeria edulis* Tussac, Fl. Antill. i. 109, t. 14; Andr. Bot. Rep. t. 649. *A. Salsilla* Gawl. in Bot. Mag. t. 1613, non Linn. — Stems elongated, sarmentose, slender, glabrous. Leaves lax, petioled, oblong or oblong-lanceolate, acute, 3-4 in. long, 1-1½ in. broad, thin in texture, glabrous beneath. Umbel compound, few or many- (4-20) rayed; bracts large, foliaceous; branches 3-6 in. long, 1-4-flowered; bracteoles small, lanceolate; lower pedicels 1-1½ in. long. Ovary turbinate, glabrous. Perianth-segments equal in length, about an inch long; outer oblanceolate-oblong, ½ in. broad, pink, with a green tip; inner cuneate-unguiculate, retuse, mucronate, ½ in. broad, greenish, copiously spotted with claret brown. Capsule 1 in. diam.

Var. *B. CHONTALENSIS* Seem. in Gard. Chron. 1871, 479; Hook. fil. in Bot. Mag. t. 5927. — A fine variety with large thin leaves, an umbel with few long branches, larger flowers, more obovate outer segments, and pale yellowish green inner segments.

Var. *B. OVATA* Mirbel. *Alstræmeria ovata* Cav. Ic. i. 54, t. 76; Hook. in Bot. Mag. t. 2846. *B. hirtella* Herb. *Alstræmeria hirtella* H. B. K. — Leaves broader, more rounded at the base, pubescent beneath. Flowers larger.

Var. *B. CORNUTA* Herb. Amaryll. 114, t. 17, fig. 4. — Outer segments of the perianth furnished with a distinct spur at the apex.

Hab. Throughout Tropical America from Cuba and Mexico to Peru and the South of Brazil. Very variable. Besides those placed above as varieties, I

cannot distinguish specifically *B. caraccensis*, *pauciflora*, *bracteata*, *obovata*, *Moritziana*, *latifolia*, *grandifolia*, *macrocarpa*, and *punctata* of Herbert, *B. Moritziana* Klotzsch, *B. miniata* and *affinis* Kunth, and *B. Brauniana*, *spectabilis*, *Schenkiana*, *Martiana*, and *salsilloides* Seubert. 560 B. ayavacensis Kr. (Ayavaca, Per.)

57. *B. JACQUESIANA* Kunth, Enum. v. 800. *Alstromera Jacquesiana* Van Houtte Flore des Serres, t. 182. — Stems elongated, glabrous, sarmentose, dark brown. Leaves distinctly petioled, oblong, acute, 4–6 in. long, 2 in. broad, moderately firm in texture, glabrous beneath. Umbel drooping, 6–12-rayed; bracts large, leaf-like; rays reach a foot or more long, 1–3-flowered; bracteoles small, lanceolate. Ovary turbinate, glabrous. Perianth-segments equal in length,  $1\frac{3}{4}$ –2 in. long; outer oblong-spathulate, bright pink, spotted only towards the edge; inner not broader, unguiculate in the lower half, greenish white, spotted all over the blade. Capsule turbinate,  $2\frac{1}{2}$  in. long, with 6 strong ribs. 565 B. baltipae Kr. (Cauca, Col.)

Hab. Brazil. Described from a plant that flowered at Kew in 1875. Allied to *B. edulis*.

58. *B. DIFFRACTA* Baker in Journ. Bot. 1882, 206. — Stems elongated, sarmentose, slender, glabrous. Leaves lax, distinctly petioled, oblong, acuminate, 6–8 in. long, 2 in. broad, thin in texture, green and glabrous beneath. Umbel of two racemose forks a foot long, bearing each 3–5 flowers on short or long ascending pedicels; bracteoles small, lanceolate. Perianth-segments equal in length,  $1\frac{3}{4}$  in. long; outer oblanceolate, pink, tipped with green; inner greenish, oblong, with a long claw, spotted all over the face.

Hab. Central Cordillera of New Granada, *André* 2310! Candinamarca, alt. 6000–7000 ft., *Lehmann* 2499!

59. *B. HERBERTIANA* Baker. *B. formosissima* Herb. et Benth. excl. syn. Ruiz et Pav. — Stems stout, elongated, sarmentose, glabrous. Leaves lax, petioled, oblong, acuminate, 5–6 in. long, moderately firm in texture, green and glabrous beneath. Umbel of 12–16 rays half a foot long, bearing each 2–3 flowers near the end; bracts many, small, foliaceous; pedicels short, ascending, pubescent. Perianth-segments equal in length,  $1\frac{3}{4}$  in. long; outer obovate-cuneate,  $\frac{3}{4}$  in. broad; inner obovate-unguiculate, copiously spotted with claret-brown. 58A B. trilobata Kr. (Ancash, Peru.)

Hab. Andes of Bogota, *Hartweg! Mark!* This is quite different from the Peruvian *B. formosissima*, figured Fl. Peruv. t. 296.

60. *B. KRANZLINI* Baker in Engl. Jahrb. 1887, 213. — Stems elongated, slender, sarmentose, terete, glabrous. Leaves lax, petioled, oblong-lanceolate, glabrous, 4–5 in. long. Umbel of 3–4 slender arcuate rays 4–9 in. long, bearing usually 2 flowers each; bracts small. Ovary deeply sulcate, glabrous. Perianth-segments equal in length,  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. long; outer segments oblanceolate, reddish,  $\frac{1}{2}$  in. broad; inner obovate-unguiculate, greenish yellow, copiously spotted with claret-brown.

Hab. Andes of New Granada; Antioquia and Cauca, alt. 7000–8000 ft., *Lehmann* 2921! *Kalbreyer* 1462!

61. *B. CARDERI* Masters in Gard. Chron. 1876, i. 795, fig. 143; Floral Mag. n. s. t. 239. — Stems elongated, sarmentose, glabrous.

Leaves lax, petioled, oblong, acute, 4-6 in. long,  $1\frac{1}{2}$ -3 in. broad, moderately firm in texture, glabrous. Umbel compound, a foot long; rays 6-9, simple or 2-4-flowered; bracts large, leaf-like; bracteoles lanceolate, an inch long. Ovary turbinate, glabrous. Perianth-segments equal in length, 2 in. long; outer oblanceolate,  $\frac{1}{2}$  in. broad, pale pink, spotted with claret-brown towards the tip; inner greenish white, cuneate-unguiculate,  $\frac{1}{2}$  in. broad, much spotted. Capsule turbinate, 2 in. long, 1 in. diam., with 6 strong ribs.

Hab. Andes of New Granada. Introduced into cultivation by Mr. Carder, through Mr. W. Bull, in 1876. Described from plants in flower at Kew, November, 1887.

62. *B. SHUTTLEWORTHII* Masters in Gard. Chron. 1882, i. 76, tabs. 77 & 85.—Stems slender, elongated, sarmentose, glabrous. Leaves petioled, oblong, acute, 5-6 in. long. Umbel of 5-10 rays reaching a foot in length, bearing about 3 flowers each on long ascending pedicels; bracts large, leaty. Ovary turbinate, glabrous. Perianth-segments equal in length, 2 in. long; outer oblanceolate,  $\frac{1}{3}$  in. broad, tinged with red; inner not broader, unguiculate in the lower half, yellow tinged with green, copiously spotted with red-brown. Capsule turbinate, 2 in. long, with 6 strong ribs.

Hab. Andes of New Granada; Province of Ocaña, alt. 5000 ft., *Lehmann* 3351! Introduced into cultivation by Carder in 1882. Pearce 727, with 20-30 rays to the umbel, is probably the same species.

63. *B. WILLIAMSIE* Masters in Gard. Chron. 1882, ii. 553.—Stems elongated, sarmentose, slender, glabrous. Leaves oblong, acuminate, membranous, glabrous. Umbel few-rayed, compound, about 12-flowered; rays  $\frac{1}{2}$  ft. long. Ovary pubescent. Perianth-segments equal in length, 2 in. long; outer oblanceolate, bright pink, white inside, copiously spotted with dark purple; inner obovate-unguiculate, whitish green, copiously spotted on the face. Capsule turbinate, 2 in. long.

Hab. New Granada; Mt. Quindio. Introduced by Mrs. Rosa Williams in 1882, through Messrs. Shuttleworth and Carder. Flowered in 1884 by Mr. Richardson at the Liverpool Botanic Garden.

64. *B. CALDASIANA* Herb. Amaryll. 119. *Alstræmeria Caldasii* H. B. K.; Bot. Mag. t. 5442.—Stems elongated, sarmentose, glabrous or slightly pubescent. Leaves thin, spreading, oblong, acute, distinctly petioled, 3-6 in. long,  $1-1\frac{1}{2}$  in. broad, rather glaucous, glabrous or pubescent beneath. Umbel simple, 6-30-flowered; bracts many, oblong-lanceolate; pedicels 1-2 in. long, pilose. Ovary hemispherical, pubescent. Perianth-segments unequal; outer oblanceolate, reddish brown,  $\frac{3}{4}$ -1 in. long; inner  $\frac{1}{2}$  in. longer, cuneate-unguiculate, bright yellow.

Hab. Andes of Ecuador and New Granada, alt. 8000-11,000 ft. Introduced into cultivation by Messrs. Veitch in 1865. A high mountain form recently received from Messrs. Sander from the Andes of Pasto, in New Granada, has leaves not more than an inch and flowers only  $\frac{3}{4}$  in. long, and we have a similar plant from Costa Rica from Mr. Sherring.

64A. *B. costaricensis* Kraenzl. (Costa Rica)  
65. *B. KALBREYERI* Baker in Journ. Bot. 1882, 204; André in Rev. Hort. 1883, 516, with figure.—Stems elongated, sarmentose,

pubescent. Leaves lax, shortly petioled, oblong, acute, 2-3 in. long, densely pubescent beneath. Umbel simple, 10-15-rayed; bracts many, small; pedicels about an inch long, densely pubescent. Ovary hemispherical, densely pubescent. Perianth-segments unequal; outer segments  $\frac{3}{4}$  in. long, oblanceolate, red-brown; inner  $\frac{1}{2}$  in. longer, cuneate-unguiculate, bright yellow, with claret-brown spots.

Hab. Andes of New Granada, alt. 9000-10,000 ft. Doubtfully distinct from *B. Caldasiana*.

66. *B. FRONDEA* Mast. in Gard. Chron. n. s. xvii. 669, fig. 102. Stems elongated, sarmentose, pubescent. Leaves lax, spreading, oblong, acute, moderately firm in texture, 4-5 in. long, pubescent, beneath. Umbel dense, simple, many-flowered; bracts many, oblong-lanceolate, foliaceous; pedicels pubescent,  $1\frac{1}{2}$ -2 in. long. Ovary pubescent. Perianth-segments unequal in length; outer oblanceolate, reddish brown,  $1-1\frac{1}{4}$  in. long; inner  $\frac{1}{2}$  in. long, cuneate-unguiculate, bright yellow, with copious spots.

Hab. Andes of New Granada, 8000-10,000 ft. Introduced into cultivation in 1882 by Messrs. Shuttleworth and Carder. Nearly allied to *B. Caldasiana*.

67. *B. ANDREANA* Baker in Journ. Bot. 1882, 205. — Stems elongated, sarmentose, pubescent. Leaves oblong-lanceolate, acute, 3-5 in. long,  $\frac{3}{4}$ -1 in. broad, thin in texture, finely pubescent beneath. Umbel simple, 10-15-rayed; bracts small; pedicels  $1\frac{1}{2}$ -2 in. long. Perianth-segments unequal in length; outer oblanceolate,  $1\frac{1}{4}$  in. long, reddish brown; inner  $\frac{1}{2}$  in. longer, bright yellow, spotted with claret-brown.

Hab. Andes of New Granada, *André* 675! 2756! *Kalbreyer* 1502! Nearly allied to *B. frondea*.

68. *B. LUTEA* Herb. Amaryll. 120, t. 5, figs. 3-5. — Stems slender, elongated, sarmentose. Leaves lax, spreading, oblong-lanceolate, 3-4 in. long, moderately firm in texture, glabrous beneath. Umbel simple, 5-6-rayed; bracts small, linear; pedicels  $1\frac{1}{2}$ -2 in. long, bracteolate, densely pubescent. Perianth-segments unequal; outer  $1\frac{1}{2}$  in. long, oblanceolate, brown, densely pubescent; inner 2 in. long, cuneate-unguiculate, bright yellow, unspotted.

Hab. Andes of Ecuador; western slope of Pichincha, *Jameson*! *Hall*!

69. *B. PATINI* Baker. — Stems elongated, sarmentose, pubescent. Leaves lax, drooping, petioled, oblong-lanceolate, 3-4 in. long, moderately firm in texture, pubescent beneath. Flowers very numerous, forming a simple umbel; bracts large, foliaceous; pedicels  $1\frac{1}{2}$ -2 in. long, pubescent, not bracteolate. Perianth-segments unequal; outer oblanceolate, brownish; inner plain yellow, 2 in. long,  $\frac{3}{2}$  in. broad, cuneate-unguiculate.

Hab. Andes of New Granada; Province of Antioquia, *Patin*! *Jervois*! Nearly allied to *B. patacoensis* Herb.

70. *B. PATACOENSIS* Herb. Amaryll. 120, t. 14, fig. 3; Hook. fil. in Bot. Mag. t. 6692. *B. conferta* Benth.; Masters in Gard. Chron. 1882, 186, t. 31. — Stems elongated, sarmentose, purple-tinted, pubescent. Leaves lax, oblong-lanceolate, 5-6 in. long, moderately firm in texture, pubescent beneath. Flowers 20-30 in a simple

umbel; bracts large, foliaceous; pedicels pubescent,  $1\frac{1}{2}$ -2 in. long, not bracteolate. Perianth-segments unequal; outer oblanceolate, bright red,  $1\frac{1}{2}$  in. long; inner cuneate-unguiculate, 2 in. long,  $\frac{1}{2}$  in. broad, bright red, with a yellow keel, with a few spots.

Hab. Andes of Ecuador and New Granada. Described from a plant that flowered at Kew in October, 1882, from Messrs. Shuttleworth and Carder.

71. *B. PARDINA* Herb. Amaryll. 120, t. 14, fig. 1.—Stems stout, elongated, glabrous, sarmentose. Leaves lax, petioled, oblong, acute, 4-6 in. long,  $1\frac{1}{2}$ -2 in. broad, thin in texture, glabrous beneath. Flowers 20 or more in a dense simple umbel; bracts foliaceous; pedicels  $\frac{1}{2}$ -1 in. long, densely pubescent. Perianth-segments unequal; outer oblanceolate,  $1\frac{1}{2}$ -2 in. long, brown tinged with red; inner nearly an inch longer,  $\frac{1}{2}$  in. broad, white, copiously spotted with violet-purple. Fruit bright red.

Hab. Andes of New Granada and Ecuador, gathered recently by Lobb, Spruce, Pearce, and André.

72. *B. DISPAR* Herb. Amaryll. 115, t. 17, fig. 1. *B. declinata* Klotzsch. *Alstrameria declinata* Popp. & Endl. Nov. Gen. ii. 44, t. 160.—Stems slender, sarmentose, glabrous. Leaves thin, oblong, acute, 6-8 in. long, 2 in. broad, green and glabrous on both surfaces. Umbel 3-5 rayed; bracts almost suppressed; pedicels 4-5 in. long, 2-3-flowered, with small bracts at the forks. Ovary turbinate, glabrous. Perianth-segments unequal; outer reddish,  $\frac{3}{4}$  in. long; inner yellowish green, an inch long.

Hab. Andes of Peru, *Mathews* 1658! *Poppig*.

73. *B. HIRSUTA* Herb. Amaryll. 114. *Alstrameria hirsuta* H.B.K.—Stems 10-15 ft. long, sarmentose, strongly angled. Leaves lax, oblong-lanceolate, very acute, 4-5 in. long,  $1-1\frac{1}{2}$  in. broad, moderately firm in texture, crisped at the base, densely pubescent beneath. Umbel 6-8-rayed; bracts few, large or altogether suppressed; pedicels 5-6 in. long, 2-3-flowered, bearing small lanceolate bracts at the forks. Ovary turbinate, pubescent. Perianth-segments unequal in length; outer reddish brown,  $\frac{1}{2}$  in. long; inner obovate-unguiculate,  $\frac{3}{4}$  in. long, yellow, spotted with claret-brown.

Hab. Andes of New Granada. Gathered originally by Humboldt; re-gathered lately by Kalbreyer.

74. *B. LYNCEA* Herb. Amaryll. 398, tab. 46, fig. 2.—Stems elongated, sarmentose, glabrous. Leaves lax, drooping, distinctly petioled, oblong, acute, 2-3 in. long,  $1-1\frac{1}{4}$  in. broad, moderately firm in texture, green and glabrous on both surfaces. Umbel dense, 20-30-rayed; bracts many, small, unequal; pedicels an inch long, densely pubescent, simple or forked. Ovary densely pubescent. Perianth-segments unequal in length; outer brownish, oblanceolate, pubescent,  $1\frac{1}{4}$  in. long; inner  $\frac{1}{2}$  in. longer, cuneate with a narrow claw, yellowish, very much spotted with claret-red.

Hab. Andes of Peru, *Mathews* 1668!

75. *B. VITELLINA* Mast. in Gard. Chron. 1882, 143, t. 151.—Stems elongated, sarmentose, glabrous. Leaves lax, ovate-oblong,

acute, 3-4 in. long. Umbel about 12-rayed; bracts 4-5, large, leaf-like; pedicels 5-6 in. long, usually once forked above the middle. Perianth-segments unequal, bright yellow; outer linear-oblong,  $1\frac{1}{4}$ - $1\frac{1}{2}$  in. long; inner obovate-unguiculate, retuse, apiculate, 2 in. long,  $\frac{3}{4}$  in. broad.

Hab. New Granada; Province of Ocana. Introduced into cultivation by Carder in 1882.

#### 54. LEONTOCHIR *Phil.*

*Perianth*-tube none; segments all alike, cuneate with a long slender claw. *Stamens* shorter than the segments, attached to their base; filaments filiform; anthers oblong, basifixed. *Ovary* turbinate, 1-celled, with 3 parietal placentas; style filiform; stigmas 3, linear, spreading. *Fruit* a strongly-ribbed capsule dehiscing at the apex. *Seeds* small, globose.

1. *L. OVALLEI* Phil. Descr. Nuev. Plant. 69; Hook. Ic. t. 1389. —Stems sarmentose, reaching a length of several feet. Leaves numerous, sessile, resupinate, oblong, acute, lower 3-4 in. long, upper gradually smaller. Umbel very dense, simple, many-flowered; pedicels very short; bracts small. Perianth-segments an inch long, reddish, not spotted, with an orbicular-cuneate blade  $\frac{1}{3}$  in. diam. Style shorter than the stamens. Capsule  $\frac{1}{2}$  in. long.

Hab. Chili, at Conception, *Bridges* 1377! Carrizal Bajo, *King*! Mr. Goldring showed me it living in February, 1883, from Kelly gardens.

### Suborder III.—AGAVEÆ.

#### 55. POLIANTHES *Linn.*

*Perianth* with a long narrowly funnel-shaped curved tube and short subequal segments. *Stamens* inserted at the middle of the tube, not exerted from its throat; filaments filiform, very short; anthers linear, erect, dorsifixed. *Ovary* 3-celled, free at the apex; ovules many, superposed; style filiform; stigmas 3, ovate, falcate. *Fruit* ovoid, crowned by the persistent perianth. *Seeds* flat, with a lax testa.

1. *P. TUBEROSA* Linn. Sp. Pl. 453; Red. Lil. t. 147; Bot. Mag. 1817; Bot. Reg. t. 63. —Rootstock tuberous. Basal leaves 6-9 to a stem, thin, linear, bright green, 1- $1\frac{1}{2}$  ft. long, deeply channelled in the lower half, spotted with red-brown on the back. Stem 2-3 ft. long, with 8-12 abbreviated leaves. Flowers in pairs in a lax spike; bracts green, lanceolate. Perianth pure waxy white.  $1\frac{1}{2}$ - $2\frac{1}{2}$  in. long; segments oblong-lanceolate, spreading,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long.

Var. *P. GRACILIS* Link & Otto, Ic. t. 24. —Habit more slender. Leaves narrower. Perianth with a long slender tube and linear segments.

Hab. Mexico. Long cultivated in all parts of the world for its fragrant flowers. We flowered *P. gracilis* at Kew in August, 1880.

## 56. PROCHNYANTHES S. Wats.

*Perianth* subpersistent, its tube subcylindrical at the base, then abruptly geniculate and dilated; segments broad, short, equal, erect. *Stamens* inserted below the throat of the perianth; filaments filiform; anthers linear, versatile. *Ovary* 3-celled; ovules numerous, superposed; style filiform; stigmas oblong. *Capsule* globose, loculicidally 3-valved. *Seeds* many, flattened, with a close dark testa.

1. *P. VIRIDESCENS* S. Wats. Cont. xiv. 457.—Stem erect from a short thick bracteate caudex, simple, leafy below, sparsely bracteate above, 4–6 ft. long. Leaves linear-lanceolate, subcoriaceous, unarmed, scabrous on the margin, a foot long, 1–1½ in. broad at the middle, narrowed to a long winged petiole. Flowers laxly racemose, greenish yellow, tinged with brown; bracts lanceolate, ½ in. long; pedicels 1–1½ in. long, not jointed. Ovary ¼ in. long, equalling the cylindrical base of the tube; throat ½ in. long; segments ¼ in. long, broadly ovate. Capsule ½ in. long.

Hab. Mexico, in the Province of Jalisco, *Dr. Palmer* 9! Discovered in 1886.

## 57. BRAVOA Llav. et Lex.

*Perianth* with a long subcylindrical tube and short ovate or oblong subequal segments. *Stamens* inserted about the middle of the perianth-tube; filaments short, filiform; anthers linear, dorsifixed. *Ovary* ovoid, umbonate at the apex, 3-celled; ovules many, superposed; style filiform; stigma trifid. *Capsule* loculicidally 3-valved. *Seeds* flattened, with a black testa.—*Rootstock* tuberous. Basal leaves few, long, lanceolate or linear, thin, entire-edged; stem-leaves much reduced. *Flowers* red or whitish, usually in distant pairs; bracts small, scariose; pedicels articulated at the apex.

Flowers bright red	.	.	Sp. 1.
Flowers whitish	.	.	Sp. 2–4.

1. *B. GEMINIFLORA* Llave et Lex. Descr. i. 6. *Catocapnia geminiflora* Link & Otto, Abbild. 35, t. 18.—Tuber globose, 1–1½ in. diam.; tunics copiously fibrous at the apex. Basal leaves 5–6, ensiform, 1–1½ ft. long, ½–¾ in. broad. Peduncle 1–1½ ft. long, bearing about 4 reduced leaves. Raceme 3–12 in. long, with flowers in distant pans; pedicels ¼–½ in. long; bracts scariose, lower lanceolate, upper ovate. *Perianth* bright red, ¾–1 in. long; segments ovate, greenish, ⅞ in. long. Anthers reaching to the throat of the tube. Capsule small, globose.

Hab. Mountains of Central Mexico, ascending to 7000 ft. Introduced into cultivation in 1838. It is almost hardy in the neighbourhood of London.

2. *B. SESSILIFLORA* Hemsl. in Biol. Cent. Amer. Bot. iii. 338, t. 86.—Tuber oblong, with tunics slitting into fine fibres at the top. Basal leaves linear, acuminate. Peduncle including inflorescence 1½–2 ft. long, bearing about 3 much-reduced leaves. Flowers

whitish, sessile in about 3 distant pairs; outer bracts small, ovate. Perianth-tube  $1-1\frac{1}{4}$  in. long; segments oblong,  $\frac{1}{4}$  in. long. Anthers a little protruded from the tube.

Hab. Mexico; San Luis Potosi, alt. 6000—8000 ft., *Parry & Palmer* 867!

3. *B. SINGULIFLORA* S. Wats. in Proc. Amer. Acad. xxii. 479.—Tuber  $1\frac{1}{2}$  in. diam. Basal leaves numerous, linear, a foot or less long,  $\frac{1}{6}-\frac{1}{3}$  in. broad, undulate on the edges. Peduncle including the inflorescence 3 ft. long. Flowers usually or always solitary; pedicels very short; outer bracts deltoid. Flowers greenish white; tube with the ovary  $1\frac{1}{4}$  in. long, tinged with purple; segments oblong,  $\frac{1}{4}-\frac{1}{3}$  in. long. Anthers reaching nearly to the tip of the segments. Capsule oblong, under an inch long.

Hab. Mexico; mountains near Chihuahua, *Pringle*. Discovered in 1886.

4. *B. BULLIANA* Baker in Gard. Chron. 1884, ii. 328. — Tuber ovoid, above 1 in. diam., the outer tunics slit into copious fibres at the top. Basal leaves lanceolate, acuminate, bright green,  $\frac{1}{2}$  ft. long,  $1-1\frac{1}{2}$  in. broad. Peduncle 2–3 ft. long, flexuose, bearing only a single much-reduced leaf. Raceme of 5–6 pairs of whitish nearly sessile flowers; bracts minute, ovate. Perianth  $1\frac{1}{2}$  in. long; tube  $\frac{1}{3}$  in. diam. at the top; segments ovate,  $\frac{1}{6}$  in. long and broad. Stamens reaching to the tip of the segments.

Hab. Mexico. Described from a plant flowered by Mr. Wm. Bull in 1884.

### 58. BESCHORNERIA *Kunth*.

*Perianth* with a very short funnel-shaped tube and subequal ascending lanceolate segments. *Stamens* inserted at the base of the segments and about equalling them; filaments filiform; anthers linear-oblong, versatile. *Ovary* clavate, 3-celled; ovules many, superposed; style thickened at the base; stigma capitate. *Capsule* subglobose, loculicidally 3-valved. *Seeds* crowded, flattened, brownish black.—*Rootstock* short, tuberous. *Basal leaves* rosulate, ascending, lanceolate, glaucous, scabrous on the margin; stem-leaves bract-like. *Flowers* clustered, greenish or reddish, arranged in simple or paniced racemes; pedicels articulated at the apex; bracts ovate, scarious. The species are all very closely allied to one another.

1. *B. TUBIFLORA* Kunth, Enum. v. 844; Hook. in Bot. Mag. t. 4642; Regel, Gartenfl. t. 851. — Leaves a dozen or more in a rosette, about a foot long,  $\frac{1}{2}$  in. broad in the wild, an inch broad in the cultivated plant, very scabrous on both surfaces. Peduncle 2–3 ft. long including the simple raceme; bract-leaves about a dozen, lanceolate; flowers 2–3 in a cluster, with unequal pedicels and a cluster of unequal ovate scarious bracts. Whole flower  $1\frac{1}{2}$  in. long; ovary  $\frac{1}{2}$  in. long; segments reddish green, an inch long,  $\frac{1}{6}$  in. broad below the tip. Stamens a little shorter than the segments.

Hab. Mountains of Central Mexico, ascending to 6000—8000 ft. Introduced into cultivation by Ehrenberg in 1845, and by Roezl in February, 1857. See Belg. Hort. 1883, p. 133. I cannot separate specifically *B. Cohniana* Jacobi inedit, which flowered at Kew, April, 1877.

2. *B. TONELIANA* Jacobi, Index, 11 (name only); Hook. fil. in Bot. Mag. t. 6091.—Leaves 15–20 in a rosette,  $1\frac{1}{2}$ –2 ft. long, 2 in. broad above the middle, narrowed to an inch above the base, very glaucous, scabrous on the margin and under surface. Peduncle 4 ft. long including the long simple raceme, reddish purple; flowers 2–5-nate; bracts and pedicels reaching an inch long. Whole flower 2 in. long; ovary cylindrical,  $\frac{3}{4}$  in. long; limb greenish; segments  $\frac{1}{8}$  in. long.

Hab. Mexico. Described from a plant flowered by Mr. Wilson Saunders at Reigate in 1874.

3. *B. YUCCOIDES* Hook. in Bot. Mag. t. 5203.—Leaves about 20 in a basal rosette,  $1\frac{1}{2}$  ft. long, 2 in. broad at the middle, narrowed to  $\frac{1}{2}$  in. above the dilated base, moderately glaucous when mature, scabrous on the edge and under surface. Peduncle 4 ft. long including the panicle, bright red; lower branches  $\frac{1}{2}$  ft. long, spreading. Whole flower 2–2 $\frac{1}{2}$  in. long; ovary cylindrical, an inch long; segments entirely green, above an inch long,  $\frac{1}{6}$  in. broad.

Hab. Mexico. Flowered in 1860 by Mr. Wilson Saunders at Reigate, and at Kew in April, 1875.

4. *B. BRACTEATA* Jacobi, Index, 11 (name only); Baker in Bot. Mag. t. 6641.—Leaves 20–30 in a basal rosette,  $1\frac{1}{2}$ –2 ft. long, 2 in. broad above the middle, contracted to less than an inch above the base, glaucous, scabrous on the edge and under surface. Peduncle 4–5 ft. long including the panicle, reddish brown; bract-leaves 3–4, lanceolate, erect. Panicle rhomboid, 2 ft. long; central branches 8–9 in. long; pedicels  $\frac{3}{4}$ –1 in. long; bracts ovate, scarious, bright red. Whole flower 2 in. long; ovary cylindrical; segments an inch long, at first red, finally tinged with red.

Hab. Mexico. Described from a plant flowered at Kew, March, 1882.

5. *B. DECOSTERIANA* Baker in Bot. Mag. t. 6768.—Leaves 15–20 in a basal rosette, 2–2 $\frac{1}{2}$  ft. long, 2–2 $\frac{1}{2}$  in. broad above the middle, narrowed to an inch above the dilated base, firm in texture for the genus, glaucous, smooth on the face, scabrous on the margin and under surface. Peduncle 7–8 ft. long including the lax panicle; lower branches a foot long, subtended by large lanceolate bracts; pedicels sometimes an inch long. Whole flower 2–2 $\frac{1}{2}$  in. long; ovary cylindrical; segments reach  $1\frac{1}{2}$  in. long. Capsule 1 in. diam.

Hab. Mexico. Flowered at Kew, February, 1884. Received from Max Leichtlin.

#### *Imperfectly-known Species.*

I know nothing of *B. Galcotti*, *pumila*, *Schlechtendalii*, and *Verlindeniana*, mentioned by name alone in Jacobi's 'Index.' We grow a plant at Kew under the name of *B. superba*, received from Mr. Thomas Hanbury, of Mentone, with greener leaves than any of the foregoing, but have not as yet flowered it.

#### 59. *DORYANTHES Correa.*

*Perianth* with scarcely any tube above the ovary; segments long, equal, falcate. *Stamens* inserted at the base of the perianth-

segments; filaments filiform, thicker downwards; anthers oblong or linear-oblong, erect, basifixed. *Ovary* clavate or cylindrical, 3-celled; ovules many, superposed; style elongated, trisulcate; stigma capitate. *Capsule* turbinate, with a woody endocarp, loculicidally 3-valved. *Seeds* flattened, reniform, with a brown testa.—*Rootstock* none. *Leaves* ensiform, forming a dense basal rosette. *Stem* with thyrsoïd or congested inflorescence attaining a height of 20 ft. or more. *Stem-leaves* much reduced. *Flowers* large, bright red, often replaced by bulbillæ, as in *Furcraa*.—A very curious and distinct genus, and all the other *Agaveæ* are American.

1. *D. EXCELSA* Correa in Trans. Linn. Soc. vi. 213, t. 23-24; Bauer, Illust. t. 13-15; Bot. Mag. t. 1685; Regel, Gartenfl. t. 421; Flore des Serres, t. 1912.—Leaves 50-100 in a rosette, ensiform, falcate, 5-6 ft. long, 3-4 in. broad at the middle, narrowed gradually to a winged petiole an inch broad, with a cylindrical point 2-3 in. long. *Stem* 10-20 ft. long, with numerous ascending bract-leaves. *Inflorescence* a terminal capitulum a foot in diam.; final bracts oblong-lanceolate, subcoriaceous, bright red, 3 in. long. *Ovary* cylindrical-triquetrous, 1½ in. long; segments linear, 2½-3 in. long. *Stamens* nearly as long as the segments; anthers linear, an inch long.

Hab. New South Wales. First properly flowered in cultivation by the Right Hon. C. Long in 1815.

2. *D. PALMERI* W. Hill; Benth. Fl. Austral. vi. 452; Hook. fil. in Bot. Mag. t. 6665; Gard. Chron. 1874, t. 44-45; Flore des Serres, t. 2097-8.—Leaves 100 or more, ensiform, strongly ribbed, 6-8 ft. long, 4-6 in. broad, narrowed downwards to a winged petiole an inch broad and furnished with a cylindrical point 4-6 in. long. *Peduncle* 6-10 ft. long, with copious short ascending leaves. *Inflorescence* a dense thyrsoïd panicle 3 ft. long; final bracts ovate, bright red, 2 in. long. *Ovary* clavate, 1½ in. long; segments lanceolate, not longer than the ovary. *Stamens* a little shorter than the segments; anthers linear-oblong, ½ in. long.

Hab. Queensland. Flowered at Brisbane, 1870; at Kew, April, 1882. Mr. Charles Moore, of the Sydney Botanic Garden, sends photographs of two marked varieties, one with a compact inflorescence and long leaves, the other with a laxer panicle and shorter leaves.

## 60. AGAVE *Linn.\**

*Perianth* funnel-shaped; tube short; segments subequal, ob-lanceolate, falcate. *Stamens* inserted at or below the throat of the tube; filaments filiform, generally much longer than the segments;

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\* Reprinted, with alterations, from the 'Gardeners' Chronicle' in 1877. The paper was translated into Italian by Baron Ricasoli, and appeared, with the original woodcuts, in vol. iv. (1879) of the 'Report of the Tuscan Horticultural Society.' For fuller details see Jacobi's elaborate Monograph, which originally appeared in the 'Hamburg Gartenzeitung,' 1864-1867, and its two Nachtrages; Engelmann's paper in vol. iii. of the 'Transactions of the Academy of Science of St. Louis'; Salmdyck in 'Hortus Dyckianus,' 1834, and Bonplandia, 1859, pp. 85-96; K. Koch in 'Wochenschrift,' 1869; Todaro's recent

anthers linear, versatile. *Ovary* oblong-cylindrical, rostrate, 3-celled; ovules many, superposed; style subulate; stigma capitate, 3-lobed. *Fruit* an oblong capsule, loculicidally 3-valved. *Seeds* discoid, with a thin black testa. — Monocarpic and acaulescent, rarely polycarpic with a produced trunk. *Leaves* densely rosulate, more or less fleshy and usually firm in texture, with a pungent end-spine and copious horny marginal prickles. *Inflorescence* densely subspicate or a thyrsoid panicle; peduncle with only reduced leaves; flowers greenish yellow, proterandrous.

*Key to Subgenera founded on inflorescence.*

**EUAGAVE.** Flowers in clusters, which are placed at the end of the branches of a deltoid thyrsoid panicle.

**LITTEA** (Tagl.). Flowers in pairs, forming a dense cylindrical subspicate inflorescence.

**MANFREDA** (Salisb.). Flowers solitary, forming a lax simple subspicate raceme or spike.

*Key to Series and Groups founded on the shape, size and texture of the leaves.*

**Series I. CORIACEO-CARNOSÆ.** Leaves persistent, both rigid and thick in texture, not at all flexible. End-spine large and pungent.

**Group 1. FILIFERÆ.** Edge of the leaf splitting off into distinct threads . . . . . Sp. 1-5.

**Group 2. MARGINATÆ.** Edge of the leaf furnished with a continuous toothed horny border from top to bottom.

Leaves ensiform.

Grandifoliæ . . . . . Sp. 6-10.

Parvifoliæ . . . . . Sp. 11-16.

Leaves oblong- or oblanceolate-spathulate.

Grandifoliæ . . . . . Sp. 17-20.

Parvifoliæ . . . . . Sp. 21-23.

**Group 3. SUBMARGINATÆ.** Edge of the leaf furnished with a continuous toothed horny border in the upper half or third, but not down to the base.

Parvifoliæ . . . . . Sp. 24-30.

Grandifoliæ . . . . . Sp. 31-34.

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figures and descriptions of new species in 'Hort. Bot. Panorm. '; and Terraciano's Synopsis (1885) of the species cultivated at Naples. My own descriptions were mostly drawn up from the living plants at Kew, and in the collections of Mr. Wilson Saunders at Reigate and Mr. J. T. Peacock at Hammersmith. Besides the published figures, there are at Kew sets of photographs made from the collections of Mr. Wilson Saunders, Baron van Elmeect, and M. van Bemmele.

Group 4. *AMERICANÆ*. Edge of the leaf without any continuous horny border below the tip; marginal teeth large, with the edge repand between them.

Leaves oblong-spathulate . . . Sp. 35-45.

Leaves oblanceolate-spathulate.

Grandifoliæ . . . Sp. 46-53.

Parvifoliæ . . . Sp. 54-60.

Group 5. *RIGIDÆ*. Edge of the leaf without any continuous horny border below the tip; teeth small, with the edge not repand between them.

Leaves oblong-spathulate . . . Sp. 61-64.

Leaves oblanceolate or ensiform . . . Sp. 65-75.

Group 6. *STRIATÆ*. Edge of the leaf minutely serrulate; surfaces strongly ribbed . . . Sp. 76-79.

Group 7. *INTEGRIFOLIÆ*. Edge of the leaf entire; surfaces not ribbed . . . Sp. 80-82.

Series II. *CARNOSO-CORIACÆ*. Leaves persistent, more fleshy and less rigid than in the last series; end-spine smaller and less pungent.

Group 8. *GEMINIFLORÆ*. Edge of the leaf splitting off into threads . . . Sp. 83.

Group 9. *ALOIDEÆ*. Edge of the leaf furnished with small distinct horny teeth.

Leaves oblong-spathulate . . . Sp. 84-92.

Leaves oblanceolate or ensiform.

Grandifoliæ . . . Sp. 93-103.

Parvifoliæ . . . Sp. 104-113.

Group 10. *SERRULATÆ*. Edge of leaf minutely serrulate. Sp. 114-115.

Group 11. *ATTENUATÆ*. Edge of leaf entire. Sp. 116-117.

Series III. *FLEXILES*. Leaves persistent, but thinner and more flexible than in the two previous series. End-spine small, scarcely pungent.

Group 12. *VIVIPARÆ*. Leaves distinctly toothed.

Leaves linear-ensiform . . . Sp. 118-119.

Leaves lanceolate . . . Sp. 120-123.

Leaves oblanceolate-oblong . . . Sp. 124-125.

Group 13. *YUCEFOLIÆ*. Leaves subentire or obscurely serrulate Sp. 126.

Series IV. HERBACEÆ (= MANFREDA). Leaves dying down annually, almost herbaceous. End-spine not at all pungent.

Stamens short . . . . .	Sp. 127.
Stamens much longer than the perianth-segments.	
Perianth-segments at least as long as the tube . . . . .	Sp. 128-134.
Perianth-segments longer than the tube . . . . .	Sp. 135-138.

#### Group 1.—FILIFERÆ.

1. A. (*Littæa*) FILIFERA Salmdyck, Hort. Dyck. 8, 309; Lemaire, Ill. Hort. t. 243; Baker in Gard. Chron. 1877, fig. 49; Berl. Monat. 1887, t. 5. — Acaulescent. Leaves 60-100 in a dense rosette, stiff, straight, ensiform, 6-9 in. long, an inch broad, narrowed gradually to a grey pungent tip, pale green, the continuous edge splitting off into grey wiry threads, the back marked with grey lines where the edges of other leaves have pressed against it. Peduncle 3-4 ft. long; bract-leaves subulate, the upper squarrose. Flowers in a dense spike 2-4 ft. long; bracts purplish brown, linear. Perianth 2 in. long including the ovary; ovary with a long beak; tube an inch long; segments linear, greenish brown,  $\frac{1}{2}$  in. long. Filaments purple,  $1\frac{1}{2}$  in. long.

Var. A. FILAMENTOSA Salmdyck in Bonpland. vii. 94; Baker in Saund. Ref. Bot. t. 164. — Leaves larger, reaching a length of 18-21 in. Peduncle including 5-6 ft. spike 10-12 ft. long.

Hab. Mexico, first described by Prince Salmdyck in 1834. Flowered at Kew in 1875 and 1887. *A. Romani* Hort. De Smet, is said to be a hybrid between this species and *A. walapensis*.

2. A. (*Littæa*) SCHIDIGERA Lemaire, Ill. Hort. t. 330; Hook. fil. in Bot. Mag. t. 5641. — Habit of *A. filifera*, from which it differs by the white marginal flæ being flattened, not subulate.

Hab. Mexico, introduced into cultivation by Verschaffelt in 1861. Flowered at Kew, 1878, 1879, 1881. According to Roetzl, in Belg. Hort. 1883, the leaves of the wild plant are sometimes bright red and sometimes dull purple. *A. Ortgiesiana* Hort. is a dwarf form, with a pale central band down the face. It flowered at the Palermo Botanic Garden in 1882.

3. A. (*Littæa*) SCHOTTII Engelm. Notes, 17. *A. geminiflora* var. *Sonora* Torrey. — Acaulescent. Leaves linear,  $\frac{1}{2}$ -1 ft. long,  $\frac{1}{4}$ - $\frac{1}{3}$  in. broad, very rigid in texture, flat or concave on the face, triquetrous on the back, very pungent at the tip, the margin splitting off into copious fine white threads. Peduncle with inflorescence 5-6 ft. long. Flowers in lax ascending pairs; pedicels very short. Perianth with ovary  $1\frac{1}{2}$  in. long; segments equalling the narrowly funnel-shaped tube. Filaments twice as long as the segments.

Hab. Sierras of Southern Arizona, *Pringle!* Discovered by the late Dr. Arthur Schott in 1855. We have a form from the Missouri Botanic Garden without any marginal threads.

4. A. (*Littæa*) PARVIFLORA Torrey in Bot. Mex. Bound. 214. — Acaulescent. Leaves linear-lanceolate from a deltoid base, rigid in texture,  $2\frac{1}{2}$ -3 in. long,  $\frac{1}{3}$  in. broad, ending in a pungent grey

spine, the edge furnished with minute brown cartilaginous teeth below the middle, above it splitting off into a few short stout white threads. Peduncle with inflorescence 4-5 ft. long. Flowers not more than  $\frac{1}{2}$  in. long; ovary oblong,  $\frac{1}{8}$  in. long; tube campanulate, a little longer than the ovary. Filaments  $\frac{1}{3}$  in. long, inserted low down in the tube, scarcely protruded beyond the tip of the segments.

Hab. Sierras of Southern Arizona, also discovered by Dr. Schott during the expedition sent to explore the Mexican boundary in 1855.

5. *A. (Littæa) ANGUSTISSIMA* Engelm. Notes, 18.—Leaves narrow linear, rigid, 2-3 ft. long,  $\frac{1}{4}$  in. broad, convex on the back, filamentose on the edges, ending in a short pungent brown spine. Peduncle with spike 5-6 ft. long.

Hab. Western Mexico, near Ocotillo, gathered by Dr. Gregg.

#### Group 2.—MARGINATÆ.

6. *A. KARATTO* Miller, Gard. Dict. No. 6, non Salmdyck.—Leaves ensiform, dark green,  $2\frac{1}{2}$ -3 ft. long, 3 in. broad, the end spine black, the border reddish brown and slightly serrated. Inflorescence unknown.

Hab. West Indies; Island of St. Kitts. A plant lately received at Kew from St. Kitts, from the Hon. J. H. H. Berkeley, is probably Miller's species in a young state. It has bright green leaves, a little narrowed below the middle and a very narrow red-brown edge, with very small hooked deltoid-cuspidate teeth.

7. *A. (Littæa) LOPHANTHA* Schiede in Linnæa, iv. 582.—Acaulescent. Leaves 30-40 in a rosette, rigid, ensiform, 2-3 ft. long,  $1\frac{1}{2}$  in. broad at the middle, dull green in the typical form,  $\frac{1}{4}$  in. thick in the centre, rather concave down the face, rounded on the back, ending in a pungent brown spine an inch long, margined by a narrow grey continuous horny line, furnished with distant grey falcate teeth about a line long. Peduncle with spike reaching a length of 15-20 ft. Flowers dense,  $1\frac{1}{4}$  in. long; tube very short; segments linear-oblong, pale green, tinged with brown, as long as the ovary. Stamens twice as long as the perianth-segments.

Hab. Mexico, introduced by Schiede about 1840. Now common in collections, with many named varieties. Flowered at Kew in the autumn of 1887. *A. cærulescens* Salmdyck is a variety with very glaucous leaves, which runs into the type through vars. *subcanescens* and *grisea*. *A. Funkiana* K. Koch & Bouché appears to be a variety with vittate leaves.

8. *A. (Littæa) UNIVITTATA* Haw. in Phil. Mag. x. 414; Baker in Saund. Ref. Bot. t. 215; Gard. Chron. 1877, fig. 58; Bot. Mag. t. 6655.—Acaulescent. Leaves 50 or more in a rosette, ensiform, very rigid in texture, 2-2 $\frac{1}{2}$  ft. long, 2-3 in. broad at the middle, narrowed very slightly downwards and gradually to a pungent end-spine an inch long, the face very slightly concave, dull dark green, with a broad pale band down the middle, the edge furnished with a continuous narrow brown margin, with distant small falcate prickles. Peduncle 3-4 ft. long, with dense squarrose bract-leaves. Spike dense, 7-8 ft. long, 4 in. diam. Ovary cylindrical, glaucous-green, an inch long; tube very short; segments yellowish,  $\frac{1}{2}$  in.

long. Stamens inserted at the throat of the tube, more than twice as long as the segments.

Hab. Mexico, introduced into cultivation about 1830. Flowered at Kew in 1880, with Mr. Peacock about the same time, and with Mr. Wilson Saunders in 1869. I cannot, from the description, separate *A. ensifera* Jacobi, Nacht. 14.

9. *A. (Littæa)* SPLENDENS Jacobi, Nacht. ii. 63.—Shortly caulescent. Leaves 50–60 in a rosette, ensiform, very rigid, above 2 ft. long, 2 in. broad at the middle, subopaque olive-green, not vittate, narrowed to a pungent point an inch long, margined with a very broad border, brown, fading to grey, the teeth very large crowded irregular subdeltoid hooked, sometimes confluent.

Hab. Described by Jacobi in 1870 from the collections of Mulman at Utrecht and Baron de Jonge van Elemeet. Allied to *A. xylonacantha*. It flowered at the Missouri Botanic Garden in January, 1885, and Mr. Shaw sent us a leaf for the Kew Herbarium.

10. *A. (Littæa)* XYLONACANTHA Salmdyck in Bonpland. vii. 92; Hook. fil. in Bot. Mag. t. 5660; Gard. Chron. 1877, fig. 81.—Shortly caulescent. Leaves not more than 20 in a rosette, ensiform, 1½–3 ft. long, 2–3 or even 4 in. broad at the middle, a slightly glaucous dead green, narrowed gradually to a pungent brown point an inch long, pale green, marked with a few darker green lines on the back, furnished with a broad continuous horny border and a few very large irregular deltoid hooked often geminate teeth. Peduncle 5–6 ft. long; bract-leaves subulate, ascending. Spike longer than the peduncle. Flowers 1¼–1½ in. long; ovary cylindrical; tube very short; segments lanceolate, greenish yellow, ½–⅔ in. long. Stamens three times as long as the segments.

Hab. Mexico, introduced from Real del Monte by Mr. Repper in 1846. Flowered at Kew in 1867, and with Mr. Wilson Saunders in 1866 & 1867. Vars. *perbella* (Gard. Chron. 1877, fig. 22) and *hybrida* (fig. 80) are dwarf forms with vittate leaves. *A. amurensis* Jacobi, Monog. 46 (*A. Kochii* Jacobi, Monog. 211) is apparently a similar dwarf form.

11. *A. (Littæa)* MULTILINEATA Baker. *A. heteracantha* Hort. Angl., non Zucc.—Acaulescent. Leaves 30–40 in a dense rosette, ensiform, a foot long, an inch broad at the middle, dark green, neither glaucous nor vittate, narrowed gradually to a pungent apex, with a narrow continuous grey edge with irregular distant small lanceolate uncinatè teeth, rounded on the back, pale green, with copious interrupted darker green lines. Peduncle 3 ft. long. Spike slender, not dense, finally 5 ft. long. Perianth 1½ in. long; tube very short; segments linear, ½ in. long. Stamens twice as long as the segments. Capsule oblong-trigonal, ¾ in. long.

Hab. Probably Mexico. Described from a plant that flowered at Kew in the autumn of 1887. We have received it lately from Leichtlin as "*A. tetragona*."

12. *A. (Littæa)* HETERACANTHA Zuccar. in Nova Acta, xvi. 2, 675; Regel, Gartenfl. t. 639. *A. Poselgerii* Salmdyck. *A. Lechuquilla* Torrey.—Acaulescent. Leaves 20 or 30 in a dense rosette, ensiform, rigid, 1–1½ ft. long, 1½–2 in. broad at the middle, dull green, with a broad pale band down the face, rounded and marked with distinct green lines down the back, the margin furnished with a distinct moderately broad grey or brown edge, with numerous middle-sized

or large hooked brown teeth. Peduncle including the dense spike reaching a length of 6–10 ft. Flower  $1\frac{1}{2}$  in. long; tube very short; segments lanceolate, above  $\frac{1}{2}$  in. long. Stamens twice as long as the segments.

Hab. Texas and Northern Mexico, *Wright* 1907! *Palmer* 1311! *Pringle* 157! We have a specimen from Mr. Shaw of a plant that flowered at the Missouri Botanic Garden in January, 1885. The strong short fibres of the leaves is used, Mr. Morris tells me, in the manufacture of brushes.

13. *A. (Littaea) KERCHOVEI* Lemaire in Ill. Hort. 1864, 64; Gard. Chron. 1877, fig. 78. *A. Beaucarnei* Lemaire.—Acaulescent. Leaves 20–30 in a rosette, ensiform, rigid, 6–12 in. long,  $1\frac{1}{2}$ –2 in. broad low down, dull green, with a pale central band on the face, rounded on the back without any darker green lines, the pungent end-spine an inch long, the continuous grey or brown border moderately broad, the irregular grey lanceolate curved teeth  $\frac{1}{6}$ – $\frac{1}{4}$  in. long. Inflorescence a dense spike. Flowers  $1\frac{1}{2}$  in. long; segments linear-oblong, twice as long as the broadly funnel-shaped tube. Stamens twice as long as the perianth-segments. Capsule an inch long.

Hab. Mexico; Chihuahua, alt. 7000–8000 ft., *Pringle* 802! Introduced by Verschaffelt about 1864, and named by Lemaire in compliment to the Baron Kerchov von Ousselghem. Widely spread now in gardens with many varieties: *inermis* is dwarf, without any spines; *pectinata* has a broader leaf than in the type, without any central band; *macrodonata* has leaves  $1\frac{1}{2}$  ft., with copious irregular grey lanceolate prickles; and *diplacantha* few distant smaller often geminate teeth. *A. rigidissima* Jacobi, Nacht. ii. 66, seems to be also a form with few very remote deltoid teeth, sometimes entirely obsolete.

14. *A. NISSONI* Baker in Gard. Chron. 1874, i. 529. — Acaulescent. Leaves 30–40 in a rosette, ensiform, rigid, 5–6 in. long,  $\frac{3}{4}$ – $\frac{7}{8}$  in. broad above the dilated base, glaucous green on the face, with a distinct pale central band, the pungent end-spine  $\frac{1}{2}$  in. long, the margin with a very narrow continuous grey edge, with copious lanceolate spines  $\frac{1}{8}$  in. long. Inflorescence unknown.

Hab. Mexico, introduced lately by Verschaffelt. Differs from all forms of *Kerchov* by its more numerous thinner leaves with a narrower border.

15. *A. ROEZLIANA* Baker in Gard. Chron. 1877, i. 529, fig. 79.—Acaulescent. Leaves 20–30 to a rosette, ensiform, rigid, 6–7 in. long, 1– $1\frac{1}{2}$  in. broad at the middle, bright glossy green on the face, with a distinct pale central band, rounded on the back without any darker green lines, narrowed to a bright reddish brown pungent spine  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, continuously margined with a moderately broad border of red-brown fading to grey, furnished with copious spreading lanceolate little-curved teeth  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Inflorescence unknown.

Var. *INGHAMII* Baker *l. c.*—Leaves  $1\frac{1}{2}$ –2 in. broad at the middle, slightly narrowed downwards, 1– $1\frac{1}{4}$  in. broad above the base.

Hab. Mexico, introduced by Roezl.

16. *A. (Littaea) VICTORIÆ-REGINÆ* T. Moore in Gard. Chron. 1875, ii. 485, with woodcut; Engelm. in Gard. Chron. 1882, ii. 841, figs. 148, 149; Ill. Hort. n. s. t. 413. *A. Consideranti* Carriere in Rev. Hort. 1875, 429, fig. 68. — Acaulescent. Leaves 100–200, forming a dense rosette a foot in diameter, densely imbricated,

lanceolate, 6-8 in. long, 13-21 lines broad above the dilated base, narrowed gradually to a rather obtuse point, which is tipped by a pungent black spine  $\frac{1}{2}$  in. long, which has usually 1-2 small deltoid teeth on each side of it, dead green, margined with a continuous white border which leaves distinct vertical bands where it is pressed against the neighbouring leaves. Peduncle 4 ft. long. Spike dense, cylindrical, 6 ft. long. Flower greenish-yellow,  $1\frac{1}{4}$  in. long; tube very short; segments oblong-lanceolate,  $\frac{1}{2}$  in. long. Stamens three times the length of the segments.

Hab. Mexico, near Monterey, first brought to Europe by M. Considerant in 1872. Flowered for the first time at the Cambridge Botanic Garden, Boston, U.S.A., in the autumn of 1882, the plant having been brought from Monterey by Dr. Palmer. A most distinct and remarkable species.

17. *A. VANDERWINNENI* Jacobi, Nacht. 19.—Acaulescent. Rosette 5 ft. broad and nearly 3 ft. high. Leaves numerous, oblong-spathulate, 2-2 $\frac{1}{2}$  ft. long, 6-7 in. broad at the middle, dull opaque, green, not vittate, banded and glaucescent on the back, with a long pungent end-spine and a continuous straight grey-brown edge, and remote regular large deltoid-uncinate brown teeth. Inflorescence unknown.

Hab. Probably Mexico. Described from the Belgian collections in 1868.

18. *A. DEMEESTERIANA* Jacobi, Monogr. 218. — Shortly caulescent. Leaves very rigid, lanceolate-spathulate, nearly 2 ft. long, 3 $\frac{1}{2}$  in. broad at the middle, narrowed to 2 $\frac{3}{4}$  in. above the base, opaque, glaucous green, not vittate, furnished with broad transverse deeper-coloured and paler bands, the end-spine short but pungent, the margin distinct, narrow, horny, repand, with broad small teeth. Inflorescence unknown.

Hab. Probably Mexico. Described by Jacobi from the Belgian collections in 1865.

19. *A. (Littea) HENRIQUESII* Baker in Gard. Chron. 1887, i. 732, fig. 70.—Acaulescent. Leaves oblong-lanceolate, rigid, bright green, 2 ft. long, 5 in. broad at the middle, pungent at the apex, with a continuous broad brown edge, with copious deltoid-cuspidate prickles  $\frac{1}{4}$  in. long, with a very broad base, which are sometimes geminate. Peduncle including inflorescence 13-14 ft. long. Spike dense, longer than the peduncle. Ovary an inch long; tube very short; segments linear, dark brown. Stamens more than twice as long as the narrow segments.

Hab. Probably Mexico. Described from a plant that flowered at the Botanic Garden of Coimbra, May, 1887, from material supplied by its Director, Prof. Henriques.

20. *A. (Littea) HAYNALDI* Todaro, Hort. Bot. Panorm. 88, t. 24. Leaves 30-40 in a dense rosette, rigidly coriaceous, dark green, a yard long, 4-5 in. broad at the middle, narrowed to 2 $\frac{1}{2}$ -3 in. above the base, with a pungent brown end-spine an inch long, margined continuously with grey brown, furnished with copious irregular middle-sized much-hooked prickles. Peduncle including the spike about 25 ft. long, the former short. Flower green, 2 in. long; tube scarcely any; segments oblong, an inch long. Filaments 2 $\frac{1}{2}$ -3 in. long.

Hab. Probably Mexico. Described by Dr. Todaro in 1878, from a plant that flowered near Palermo. Named after Archbishop Haynald.

21. *A. GHEISBREGHTII* Lemaire; Jacobi, Monogr. 42. — Acaulescent. Leaves 30–60 in a dense rosette, lanceolate-spathulate, rigid, bright glossy green, not vittate, 9–12 in. long,  $2\frac{1}{2}$ –3 in. broad at the middle, narrowed to  $2$ – $2\frac{1}{2}$  in. above the dilated base, the pungent end-spine  $\frac{1}{2}$  in. long, the back not striated with green lines, the border red-brown till a late-stage, the copious irregular lanceolate-deltoid teeth  $\frac{1}{6}$ – $\frac{1}{4}$  in. long. Inflorescence unknown.

Var. *A. ROHANI* Jacobi, Monogr. 43. — Leaves about  $\frac{1}{2}$  ft. long. Deader green, vittate down the face.

Var. *A. LEGUAYANA* Hort. — Leaves a foot long,  $1\frac{1}{2}$  in. broad at the middle, with a narrower edge.

Hab. Mexico, sent by Gheisbreght in 1862 to Verschaffelt.

22. *A. PEACOCKII* Croucher in Gard. Chron. 1873, 1400, tab. 283. — Acaulescent. Leaves 40–60 in a rosette, rigid, oblanceolate-spathulate, 9–12 in. long, 2 in. broad above the middle, narrowed to  $1\frac{1}{2}$  in. above the dilated base, dull green, with a pale central band down the face, the pungent end-spine an inch long, the moderately broad continuous horny border at first red-brown, then grey, the large subdistant deltoid-cuspidate prickles  $\frac{1}{4}$ – $\frac{1}{3}$  in. long. Inflorescence unknown.

Hab. Central Mexico; Province of Tehuacan, imported by Roezl. Described from a plant seen at Mr. J. T. Peacock's in November, 1872.

23. *A. (Littca) HORRIDA* Lemaire; Jacobi, Monogr. 43; Baker in Bot. Mag. t. 6511. *A. Desmetiana* and *Regeliana* Hort. — Acaulescent. Leaves 30–50 in a dense rosette, rigid, lanceolate-spathulate, 9–12 in. long,  $1\frac{1}{2}$ –2 in. broad at the middle, bright green, not vittate, the pungent end-spine  $\frac{3}{4}$ –1 in. long, the margin furnished with a continuous broad grey border, with copious large deltoid-cuspidate teeth  $\frac{1}{3}$ – $\frac{1}{2}$  in. long. Peduncle stout, 3–4 times as long as the leaves; bract-leaves copious, subulate, squarrose. Spike very dense, as long as the peduncle. Flowers  $1\frac{3}{4}$  in. long; tube funnel-shaped,  $\frac{1}{3}$  in. long; segments lanceolate, yellowish green, as long as the ovary. Stamens under three times the length of the segments.

Var. *MACRODONTA* Baker in Gard. Chron. 1877, 623. — Leaves 50–60, broader than in the type ( $2\frac{1}{2}$  in.). Spines larger.

Var. *MICRACANTHA* Baker in Gard. Chron. l. c. fig. 98. *A. grandidentata* Jacobi, Monogr. 207. — Border of the leaf narrower, and spines smaller than in the typical form. *A. Morganii* Hort. differs from this by its larger teeth.

Var. *A. GILBEYI* Hort.; Gard. Chron. 1873, 1305, fig. 270; 1877, fig. 101; Regel, Gartenfl. 1874, 89, with woodcut. — Leaves about 30, not more than 3–4 in. long, 2 in. broad at the middle, dark green, with a pale stripe down the centre, the border as broad as in the type, with 3–4 large spines on each side. — Introduced by Roezl from Tehuacan.

Var. *A. TRIANGULARIS* Jacobi in K. Koch Wochen. 1869, 178. — Leaves obovate, glaucous grey, about 4 in. long by 3 in. broad, the border very broad, the teeth very large and curved.

Hab. Mexico, introduced by Verschaffelt in 1862. The type is described from a plant of Mr. J. T. Peacock's that flowered at Kew in April, 1880. We have a photograph from Dr. Todaro of a tuft that bore 10—12 spikes simultaneously in the Palermo Botanic Garden in 1885. I cannot, by the description, separate *A. Maireretiana* Jacobi, Monogr. 215.

### Group 3.—SUBMARGINATÆ.

24. *A. PUMILA* Hort. De Smet.—Acaulescent. Leaves 7—8 in a dense rosette, an inch high,  $2\frac{1}{4}$ — $2\frac{1}{2}$  in. diam., ovate, thick, rigid, more or less ascending,  $1$ — $1\frac{1}{4}$  in. broad,  $\frac{1}{2}$ — $\frac{3}{4}$  in. long, narrowed suddenly to a weak dark end-spine  $\frac{1}{4}$  in. long, which is decurved as a narrow line half-way down the blade; marginal prickles distant, lanceolate, hooked, deflexed,  $\frac{3}{4}$ — $\frac{1}{6}$  in. long. Inflorescence unknown.

Hab. Probably Mexico. Our Kew plant of this curious very dwarf species was received from De Smet in 1879, and in eight years has not increased in size materially. It produces offsets freely about the base.

25. *A. (Euagave) SHAWII* Engelm. Notes, 26, tabs. 2 and 3.—Acaulescent. Leaves 50—60 or more, oblong-spathulate, 8—10 in. long,  $3\frac{1}{2}$ — $4\frac{1}{2}$  in. broad at the middle, dull green, slightly glaucous, narrowed to a brown pungent end-spine an inch long, the horny border decurrent, the edge below it furnished with copious upcurved lanceolate brown teeth  $\frac{1}{4}$ — $\frac{1}{2}$  in. long. Peduncle 8—12 ft. Panicle thyrsoid, about 2 ft. long and broad; branches stout, 4—9 in. long. Flowers 3— $3\frac{1}{2}$  in. long, greenish yellow; tube broadly funnel-shaped,  $\frac{1}{2}$ — $\frac{3}{4}$  in. long; segments an inch or more. Stamens half as long again as the segments. Capsule oblong-trigonal, cuspidate,  $2\frac{1}{2}$ — $2\frac{3}{4}$  in. long.

Hab. Dry hills bordering the Pacific at the south-west corner of California, discovered by Dr. Parry in 1850. Named by Dr. Engelmann after Mr. Henry Shaw, who founded and endowed the Botanic Garden at St. Louis, Missouri. In 1885 Mr. Shaw kindly sent us a set for the Kew Herbarium of the leaves of all the Agaves he had in cultivation. Introduced into cultivation about 1875.

26. *A. (Euagave) DESERTI* Engelm. Notes, 22.—Acaulescent. Leaves few in a rosette, oblanceolate,  $\frac{1}{2}$ —1 ft. long,  $1\frac{1}{2}$ —2 in. broad above the middle, very glaucous, deeply concave on the face, with a long slender brown end-spine decurrent to about the middle of the edge, both this and the unbordered lower half of the leaf being furnished with crowded strong hooked horny lanceolate prickles  $\frac{1}{6}$ — $\frac{1}{4}$  in. long. Peduncle slender, reaching 6—10 ft. Panicle thyrsoid; branches very short; lower horizontal. Flower yellow, under 2 in. long; tube  $\frac{1}{5}$ — $\frac{1}{6}$  in. long and broad; segments oblong,  $\frac{3}{4}$  in. long. Stamens twice as long as the segments.

Hab. Eastern base of the mountains of Southern California, discovered by Lieut. Emory in 1846. Introduced into cultivation about 1875.

27. *A. (Euagave) HUACHUCENSIS* Baker.—Leaves very thick and rigid, oblong, 15—16 in. long,  $\frac{1}{2}$  ft. broad at the middle, the brown pungent end-spine above an inch long, decurrent as a horny border to the middle of the blade, both it and the rest furnished with copious deflexed brown prickles, the upper ones lanceolate-deltoid,  $\frac{1}{3}$ — $\frac{1}{2}$  in. long, the lower growing regularly gradually smaller. Flower  $2\frac{1}{2}$  in. long; tube funnel-shaped,  $\frac{1}{3}$ — $\frac{1}{2}$  in. long and broad;

segments  $\frac{3}{4}$  in. long, yellow, lanceolate from a deltoid base. Stamens 2-3 times the length of the segments.

Hab. Arizona; Huachuca Mountains, alt. 5000-8000, *Pringle!* Received in 1885. Nearly allied to *A. Shawii*, Engelm.

28. *A. (Euagave) APPLANATA* Lemaire; Jacobi, Monogr. 48; Sodaro Hort. Bot. Panam. ii. 29, t. 30.—Acaulescent. Leaves sometimes 150, oblong-spathulate, 8-12 in. long, 3-3 $\frac{1}{2}$  in. broad at the middle, narrowed to 2-2 $\frac{1}{2}$  in. above the base, intensely persistently glaucous, the lower half of the face flat, the upper half concave, the pungent end-spine an inch long, decurrent as a brown border the upper third or half of the blade, the bright brown deflexed lanceolate prickles  $\frac{1}{4}$ - $\frac{1}{3}$  in. long. Peduncle 3-4 times as long as the leaves. Panicle thyrsoid, as long as the peduncle; lower branches patent. Flowers greenish yellow, 2 $\frac{1}{2}$ -3 in. long; tube short; segments lanceolate, an inch long. Stamens 2-3 times the length of the segments.

Hab. Mexico, introduced into cultivation about 1862. Flowered for the first time lately with Dr. Todaro at the Palermo Botanic Garden. I cannot, from the description, clearly separate *A. cinerascens*, Jacobi Monogr. 51.

29. *A. (Euagave) ASPERRIMA* Jacobi Monogr. 61.—Acaulescent. Leaves few, oblanceolate, 1 $\frac{1}{2}$ -2 ft. long, 3-4 in. broad at the middle, dull green when mature, glaucous when young, scabrous on both surfaces, with a very large pungent end-spine decurrent for half a foot or more, the prickles very large and deltoid-cuspidate. Flowers 2 $\frac{1}{2}$  in. long; tube broadly funnel-shaped  $\frac{1}{2}$  in. long; segments yellowish, under an inch long. Stamens more than twice as long as the segments. Capsule oblong, 1 $\frac{1}{2}$ -2 in. long.

Hab. Mexico; State of Coahuila, *Palmer* 1309! *Pringle* 158! Described by Jacobi in 1864 from plants sent by Lindheimer to the Botanic Garden of Munich. Dr. Engelmann sent out seeds under the name of *A. longispina*.

30. *A. TONELIANA* Baker in Gard. Chron. 1881, i. 362.—Acaulescent. Leaves 40-50 in a dense rosette, lanceolate, rigid, 1 $\frac{1}{2}$ -2 ft. long, 3-4 in. broad at the middle, narrowed to 2 $\frac{1}{2}$ -3 in. above the base, flat in the lower half, green, glaucous only when young,  $\frac{1}{8}$  in. thick in the centre; the pungent brown end-spine an inch long, decurrent for 3-4 in., the rest of the border margined with chesnut-brown cuspidate prickles 1-8th to 1-12th in. long with a very broad base, which is confluent except for a short space above the middle of the blade. Inflorescence unknown.

Hab. Probably Mexico. Described from a plant of Mr. J. T. Peacock's, when his collection was exhibited at Kew in 1881. Named after M. Tonel, of Ghent.

31. *A. (Euagave) HOOKERI* Jacobi, Monogr. 219; Baker in Bot. Mag. t. 6589.—Acaulescent. Leaves 30-40 in a rosette, oblanceolate, 4 ft. long, 6-9 in. broad at the middle, narrowed to 4-5 in. above the base, green, only slightly glaucous when young and towards the base, narrowed gradually to a pungent end-spine 1 $\frac{1}{2}$ -2 in. long, which is decurrent as a narrow brown edge for 4-6 in., the prickles deltoid-cuspidate from a broad base  $\frac{1}{4}$ - $\frac{1}{3}$  in. long. Peduncle 30 ft. long including the panicle, 4-5 in. thick at the base. Panicle thyrsoid, 4-5 ft. long, the lower branches a

foot long. Flowers greenish yellow, 3 in. long; tube broadly funnel-shaped,  $\frac{1}{2}$  in. long; segments  $1\frac{1}{4}$  in. Stamens more than twice as long as the segments.

Hab. Mexico. Described by Jacobi in 1865 from plants at Kew and Reigate. At Kew it flowered for the first time in October, 1880. *A. Fenzliana* Jacobi Monogr. 221 differs from typical *Hookeri* (see N. E. Brown in Gard. Chron. 1883 i. 507) by its smaller prickles. I cannot from the description separate *A. inaequidens* K. Koch in Wochen. 1860, 28, and if this be the same that name is the earliest.

32. *A. (Euagave) ATROVIRENS* Karw.; Salmdyck, Hort. Dyck. 1834, 302. *A. tehuacensis*, Karw. *A. Salmiana* Otto; Rev. Hort. 1873, 373, tabs. 40-41; Gard. Chron. 1871 ii. 141, t. 31, 1877, 2, fig. 33. — Acaulescent. Leaves 12-30, oblanceolate-spathulate, 2-4 ft. long in cultivation, 4-6 in. broad above the middle, narrowed to 3-4 in. above the base, a dull slightly glaucous green, the face often very concave, the pungent end-spine  $1\frac{1}{2}$ -2 in. long and decurrent for 6-12 in., the large deltoid-cuspidate teeth hooked either up or down, with the edge repand between them. Peduncle with inflorescence reaching a length of 25-30 ft. Panicle 6-8 ft. long; flowers 4 in. long; tube short; segments  $1\frac{1}{2}$  in. long. Stamens 3 in. long. I cannot from the descriptions definitely separate *A. Jacobiana*, Salmdyck, *A. Canartiana*, *Schlechtendalii*, *defleatispina*, *Otonis* and *gracilis* Jacobi.

Var. *A. LATISSIMA* Jacobi, Monogr. 41.—Leaves broader, oblong-spathulate, 2-3 ft. long by 8-9 in. broad above the middle. From this I cannot separate *A. Lehmanni*, *mitraformis* and *coarctata* Jacobi.

Hab. Mexico, introduced into cultivation by Karwinski, who says that the leaves of the wild plant reach a length of 12 feet. It must be borne in mind that the dimensions of the leaves in these descriptions are almost invariably taken from plants cultivated in pots under glass, and that, therefore, no doubt they are often far short of what the plant reaches in its native stations. This is said to be the species specially used in the manufacture of pulque. It has flowered at Paris, Antibes, and on the shores of the Lago Maggiore, and is now doing so at Kew.

33. *A. (Euagave) COCHLEARIS* Jacobi, Nacht. ii. 67.—Acaulescent. Leaves few in a rosette, oblong-spathulate, 5-6 ft. long, above a foot broad, opaque green, with a deeply excavated face, the very stout pungent end-spine decurrent for some distance, the middle-sized deltoid-cuspidate brown prickles variously curved. Peduncle with inflorescence reaching a length of 26 feet. Flowers 4 in. long; tube short; segments yellowish green above  $1\frac{1}{2}$  in. long. Stamens 3 in. long.

Hab. Mexico. Described by Jacobi from a plant that flowered at Stuttgart in 1867. Perhaps not distinct specifically from *A. atrovirens*.

34. *A. (Euagave) SPECTABILIS* Todaro, Hort. Bot. Panorm. ii. 4, t. 25.—Acaulescent. Leaves 180 in a rosette, lanceolate, very glaucous, 6-7 ft. long, 5 in. broad at the middle, with a large pungent spine decurrent for half a foot and middle-sized lanceolate-deltoid brown teeth, with the edge not repand between them. Panicle thyrsoïd; branches erecto-patent, the lower above a foot long. Flowers greenish yellow,  $2\frac{1}{2}$  in. long; tube very short; segments above an inch long. Stamens twice as long as the segments.

Hab. Probably Mexico. Flowered in 1879 with Dr. Todaro at the Palermo Botanic Garden.

Group 5.—AMERICANÆ.

35. *A. CUCULLATA* Lemaire; Jacobi, Monogr. 89.—Acaulescent. Leaves about 20 in a dense rosette, oblong-spathulate, very glaucous, 4–4½ in. long, 3 in. broad, the pungent end-spine ½ in. long, the close horny deltoid-cuspidate teeth ⅙ in. long. Inflorescence unknown.

Hab. Mexico, introduced into cultivation by Verschaffelt about 1860. Perhaps only a dwarf variety of *A. Scolymus*. *A. Simsii*, *Croucheri* and *rotundifolia*, Hort. are closely allied forms.

36. *A. (Euagave) MEGALACANTHA* Hemsl. Diag. iii. 55; Biol. Cent. Amer. iii. t. 88 A.—Leaves oblong, 4 in. long, 3 in. broad, with a pungent end-spine above an inch long and 5–6 very large prickles on each side with a horny deltoid-cuspidate apex. Flower 1¾ in. long; tube very short; segments lanceolate, yellow, ¾ in. long. Filaments 1–1¼ in. long.

Hab. Mexico, at Pedregat, near the city of Mexico. *Bourgeau* 1020 bis! Collected during the French expedition of 1863–1866.

37. *A. (Euagave) SEEMANNIANA* Jacobi, Nacht. 29.—Acaulescent. Leaves about 20 in a rosette, oblong-spathulate, 6–9 in. long, 3–3½ in. broad at the middle, narrowed to 2 in. above the base, slightly glaucous, the face flat except near the tip, the dark brown pungent end-spine ½ in. long, the teeth small, moderately close, deltoid-cuspidate, decurved. Peduncle with panicle reaching a length of 6 ft.

Hab. Guatemala, introduced into cultivation by Dr. Seemann through Mr. W. Bull in 1868.

38. *A. (Euagave) PARRYI*, Engelm. Notes, 23.—Acaulescent. Leaves 20–30 in a rosette, oblong-spathulate, 10–12 in. long, 3–3½ in. broad at the middle, narrowed to 2½ in. above the base, the brown pungent end-spine an inch long, the slender brown horny teeth not more than ⅙ in. long in the upper part of the blade. Peduncle 8–12 ft. long. Panicle about 3 ft. long. Flower 2 in. long; tube broadly funnel-shaped, ⅓ in. long; segments lanceolate, ¾ in. long. Stamens more than twice as long as the segments. Capsule oblong-trigonus, 1¾ in. long.

Hab. Arizona and New Mexico, discovered by Lieut. Emory in 1846. Distributed in European gardens by Dr. Engelmann in 1868 from seeds gathered by Dr. Parry. Flowered at the Missouri Garden in 1879.

39. *A. (Euagave) WISLIZENI* Engelm. Notes 32. *A. scabra* Salmdyck in Bonpland. vii. 89.—Acaulescent. Leaves about 30 in a rosette, oblong, a foot long, 3–5 in. broad at the middle, very rigid, very glaucous, the end-spine hard and pungent, shortly decurrent, the subdistant middle-sized spines deltoid-cuspidate, straight or hooked. Peduncle with panicle reaching 10–12 feet. Flower 2½ in. long; tube short, obconic; segments yellowish, ¾ in. long. Stamens more than twice as long as the segments. Capsule 2 in. long.

Hab. Northern Mexico; province of Chihuahua, &c., *Palmer* 1310! *Pringle* 22! Discovered by Dr. Wislizenus in 1847.

40. *A. FEROX* K. Koch in Wochens. 1860, 23.—Acaulescent. Leaves 20–30 in a rosette, oblong-spathulate  $1\frac{1}{2}$ –2 ft. long, 6–9 in. broad at the middle, narrowed to  $4\frac{1}{2}$ –5 in. above the dilated base, a dull slightly glaucous green, the face flat except at the top, the slightly decurrent pungent point above an inch long, the very large deltoid-cuspidate brown teeth  $\frac{1}{3}$ – $\frac{1}{2}$  in. long, with the edge deeply repand between them. Inflorescence unknown.

Hab. Mexico, not unfrequent in cultivation. *A. Bonnetiana* of the Belgian Gardens is scarcely different.

41. *A. GALEOTTEI* Baker in Gard. Chron. 1877, ii. 41.—Acaulescent. Leaves 30–40 in a dense rosette, oblong-spathulate,  $1$ – $1\frac{1}{2}$  ft. long, 4–6 in. broad above the dilated base, the face flat or rather concave, green, hardly at all glaucous when mature, the pungent end-spine  $\frac{3}{4}$ –1 in. long, the close deltoid-cuspidate purplish black prickles  $\frac{1}{6}$ – $\frac{1}{4}$  in. long, straight or slightly hooked. Inflorescence unknown.

Hab. Mexico. Described from plants seen in the Saunders and Peacock collections in 1872.

42. *A. (Euagave) GUEDENEYRI* Houlet in Rev. Hort. 1875, 466.—Acaulescent. Leaves about 30 in a rosette, oblong-spathulate,  $2\frac{1}{2}$  ft. long, 4–5 in. broad above the middle, dull glaucous green, with a pungent end-spine an inch long and small brown deltoid-cuspidate prickles  $\frac{1}{8}$ – $\frac{1}{6}$  in. long. Flowering stem 10–12 ft. long. Panicle thyrsoïd, with about 20 branches. Flowers yellowish green. Stamens much exerted.

Hab. Mexico. Of this I have seen only a young plant in the collection of Mr. J. T. Peacock. It flowered in the collection of M. Guedeney at Vesinet, in 1875.

43. *A. (Euagave) LONGISEPALA* Todaro, Hort. Bot. Panorm. t. 31.—Acaulescent. Leaves moderately numerous, oblong-spathulate, glaucous green, 7–8 in. broad at the middle, narrowed to 3–4 in. above the base, the pungent end-spine an inch long, the edge slightly repand between the large broad-based deltoid-cuspidate teeth. Peduncle about 5 times as long as the leaves. Panicle shorter than the peduncle; branches ascending. Flower  $2\frac{1}{2}$ –3 in. long; tube short; segments yellowish green,  $1\frac{1}{2}$  in. long. Stamens very long.

Hab. Probably Mexico. Flowered lately with Dr. Todaro at the Palermo Botanic Garden.

44. *A. (Euagave) SCOLYMUS* Karw.; Salmdyck Hort. Dyck. 307; Baker in Saund. Ref. Bot. t. 328.—Acaulescent. Leaves 20–40 in a dense rosette, oblong-spathulate, 9–18 in. long, 3–6 in. broad above the middle, very glaucous, the pungent end-spine an inch or more long, the large horny deltoid-cuspidate teeth  $\frac{1}{4}$ – $\frac{1}{3}$  in. long, in the upper half of the blade, with the edge distinctly repand between them. Peduncle including the thyrsoïd panicle 14–16 ft. long. Flower 2–3 in. long; tube short, broadly funnel-shaped; segments greenish-yellow,  $\frac{3}{4}$ –1 in. long. Stamens twice as long as the segments.

Hab. Mexico, introduced into cultivation about 1880, and now common, with numerous varieties. Under this I place *A. Schnittspanii* Jacobi, *A.*

*amœna* Lemaire (smaller than typical *Scolymus*), *A. Verschaaffeltii* Lemaire in Ill. Hort. t. 564, Baker in Saund. Ref. Bot. t. 306, *A. Saundersii* Hook. in Bot. Mag. t. 5493 (leaves about a foot long; teeth very large), *A. crenata* Jacobi, *A. Mescal* K. Koch (less glaucous than the type), and *A. auricantha* Hort. (leaves thinner and more numerous than in the type, moderately glaucous, with smaller prickles). *A. Verschaaffeltii medio-picta* Hort. De Smet is a form with variegated leaves. A plant which, so far as leaf goes, might be a form of *Scolymus*, flowered at Kew in 1887 with panicle branches quite suppressed, thus furnishing a link of transition between the subgenera *Euagave* and *Littœa*.

45. *A. (Euagave) POTATORUM* Zuccar. in Nova Acta xvi. 2. 674.—Acaulescent. Leaves about 20 in a rosette, oblong-spathulate, 2–2½ ft. long, 7–9 in. broad at the middle, narrowed to 4–5 in. above the base, a dull glaucous green, the face slightly concave, the slightly decurrent pungent end-spine 1½–2 in. long, the horny deltoid-cuspidate prickles ¼–⅓ in. long, with the edge repand between them. Peduncle 10–12 ft. long, including the thyrsoid panicle, which is 4–5 ft. long. Flowers 3 in. long; tube short; segments greenish yellow, an inch long. Stamens twice as long as the segments.

Hab. Mexico, introduced into cultivation about 1830. Doubtfully distinct specifically from *A. Scolymus*.

46. *A. OLIGOPHYLLA* Baker in Gard. Chron. 1878, 492. *A. paucifolia* Baker non Todaro.—Acaulescent, densely cæspitose and soboliferous. Leaves 6–8 in a rosette, lanceolate, 3–4 in. long, ½–⅝ in. broad, slightly glaucescent, broadly channelled all down the face, narrowed gradually to a weak end-spine ¼–⅓ in. long, the prickles lanceolate, horny, decurved, the central ones ⅞ in. long, the upper and lower smaller. Inflorescence unknown.

Hab. Probably Mexico. Described from a plant in the possession of Mr. Justus Corderoy, of Blewbury, near Didcot, in 1878.

47. *A. (Littœa) UTAHENSIS* Engelm. Notes, 20.—Acaulescent. Leaves ensiform, ½–1 ft. long, 12–21 lines broad, thick, glaucous, rigid, the pungent end-spine an inch long, the deltoid teeth ⅓–¼ in. long, white with a darker base. Peduncle 5–7 ft. long including the 1–2 ft. spike. Flowers about an inch long; tube very short; segments ½ in. long. Stamens little exerted. Capsule oblong, an inch long.

Hab. Southern Utah and Arizona. Introduced into cultivation about 1880. This reaches the farthest north of all Agaves.

48. *A. (Littœa) MACRACANTHA* Zuccar. in Nova Acta xvi. 2, 676; Baker in Gard. Chron. 1877, ii. tab. 27. *A. flavescens* Salmdyck. *A. Bessereriana* Jacobi; Bot. Mag. t. 5940.—Acaulescent or shortly caulescent. Leaves 30–50 in a rosette, lanceolate, ½–1 ft. long, 1–1½ in. broad above the middle, very rigid, very glaucous, the face rather turgid in the lower half, the end-spine nearly black, very pungent, ½–¾ in. long, the purplish-black small subdeltoid-cuspidate prickles ⅓–¼ in. long. Peduncle 2–3 ft. long. Flowers 10–12 in a lax raceme, all solitary on ascending pedicels ¼–½ in. long. Perianth 2 in. long; segments greenish, three times as long as the tube. Stamens exerted about half an inch.

Hab. Mountains of Central Mexico, ascending to 5000–6000 ft. Introduced into cultivation about 1830. Flowered with Mr. Saunders in the spring of 1871. I cannot separate specifically *A. subfulcata* and *linearis* Jacobi.

49. *A. CONCINNA* Baker in Gard. Chron. 1877, ii. 137.—Acaulescent. Leaves about 30 in a rosette, oblanceolate, rigid, 7-8 in. long, 2 in. broad at the middle, narrowed to  $1\frac{1}{2}$  in. above the base, the face flat, slightly glaucous, the pungent end-spine nearly an inch long, the subdistant much-hooked deltoid-cuspidate prickles  $\frac{1}{4}$  in. long. Inflorescence unknown.

Hab. Probably Mexico. Described from the Peacock collection in 1872.

50. *A. FLACIDA* Jacobi, Monogr. 226; Baker in Gard. Chron. 1877, fig. 26.—Acaulescent. Leaves 40-50 in a rosette, oblanceolate, a foot long, 3 in. broad above the middle, narrowed to  $1\frac{1}{2}$  in. above the dilated base, glaucous-green, the face flat throughout, the slightly decurrent pungent end-spine an inch long, the crowded deltoid-cuspidate slightly-hooked prickles 1-6th to 1-5th in. long. Inflorescence unknown.

Hab. Probably Mexico. Described from a plant seen in the Saunders collection in 1872. Intermediate between *Scolymus* and *macracantha*.

51. *A. VIRIDISSIMA* Baker in Gard. Chron. 1877, ii. 137.—Acaulescent. Leaves about 30 in a rosette, oblanceolate, a foot long, 3 in. broad above the middle, narrowed to  $2\frac{1}{2}$  in. above the base, very rigid, bright green, the face flat, the end-spine hard and pungent, nearly an inch long, the close grey spreading lanceolate unequal prickles  $\frac{1}{6}$ - $\frac{1}{4}$  in. long, those of the upper half of the blade slightly curved upwards. Inflorescence unknown.

Hab. Probably Mexico. Described from a plant seen in the Peacock collection, Nov., 1872.

52. *A. (Euagave) WEISSENBURGENSIS* Wittm. in Berl. Gartenzeit, 1885, 14, fig. 5.—Acaulescent. Leaves 30-40, oblanceolate, 8-9 in. long, 2- $2\frac{1}{2}$  in. broad above the middle, rigid, green, scarcely at all glaucous, the pungent end-spine  $\frac{1}{2}$  in. long, the hooked distant deltoid-cuspidate prickles  $\frac{1}{8}$ - $\frac{1}{6}$  in. Peduncle with panicle 7-8 ft. long, the latter of few very short ascending branches. Flower above 2 in. long; tube  $\frac{1}{2}$  in.; segments greenish yellow, lanceolate,  $\frac{3}{4}$  in. long. Stamens twice as long as the segments. Capsule  $1\frac{1}{2}$  in. long.

Hab. Probably Mexico. Described by Dr. Wittmack from a plant that flowered at Weissenburg, in the province of Brandenburg, in 1885.

53. *A. (Euagave) BAXTERI* Baker.—Acaulescent. Leaves about 30 in a dense rosette, oblanceolate-spathulate, 3 in. broad above the middle, narrowed to 2 in. above the face, flat on the face, moderately glaucous, the pungent end-spine about an inch long, the marginal teeth subdistant, lanceolate, hooked, horny to the base, at most  $\frac{1}{6}$  in. long. Peduncle glaucous, 4 ft. long, an inch thick. Panicle thyrsoid, 4 ft. long; branches erecto-patent, the central ones 4-5 in. long, with flowers up to 20 in a dense cluster at the end. Flowers about 2 in. long; ovary  $\frac{3}{4}$  in.; tube short.

Hab. Probably Mexico. Described from a plant that flowered at Kew in the spring of 1888, received from the Oxford Botanic Garden, named after its late Curator.

54. *A. (Euagave) PALMERI* Engelm. Notes, 31.—Acaulescent. Leaves about 30 in a rosette, oblanceolate, 1- $1\frac{1}{2}$  ft. long, 2- $2\frac{1}{2}$  in.

broad above the middle, narrowed to  $1\frac{1}{2}$  in. above the base, glaucous, the shortly decurrent pungent end-spine  $1-1\frac{1}{2}$  in. long, the edge slightly repand between the large deltoid-cuspidate prickles, of which those of the upper half of the blade are  $\frac{1}{4}-\frac{1}{3}$  in. long. Peduncle with panicle 8-12 ft. long. Flowers  $1\frac{3}{4}-2$  in. long; tube very short; segments yellowish, oblong-lanceolate,  $\frac{3}{4}$  in. long. Stamens more than twice as long as the segments. Capsule  $1\frac{1}{2}-2$  in. long.

Hab. Mountains of Southern Arizona, ascending to 6300 ft. *Vasey!* *Pringle!* Discovered by Dr. Schott in 1855. Introduced into cultivation in Europe about 1880.

55. *A. (Euagave) MARMORATA* Roezl in Belg. Hort. 1883, 238.—Acaulescent. Leaves 12-15 in a rosette, spreading, oblanceolate. 2-3 ft. long, 4-5 in. broad above the middle, narrowed to  $2-2\frac{1}{2}$  in. above the base, glaucous, concave in the upper half of the face, very rough on both sides, the pungent end-spine an inch long, the margin very repand between the close irregular large deltoid-cuspidate prickles, which are  $\frac{1}{4}-\frac{1}{3}$  in. long and broad with a curved brown horny tip. Peduncle with panicle 10-16 ft. long.

Hab. Mexico; Province of Tehuacan. Introduced into cultivation by Roezl. Described from two plants in the Kew collection in 1887. Between *A. Scolymus* and *americana*. Used by the Indians for abrasions of the skin of their horses and mules.

56. *A. (Euagave) THEOMETEL* Zuccar. in Roem. Collect. 138, t. 3.—Acaulescent. Leaves about 30, oblanceolate-spathulate,  $1\frac{1}{2}-2$  ft. long,  $4\frac{1}{2}-5$  in. broad above the middle, narrowed to 3 in. above the dilated base, the face nearly flat, green, only slightly glaucous when young, the dark brown pungent end-spine an inch long, the distant deltoid-cuspidate prickles not more than  $\frac{1}{3}$  in. long. Peduncle 10-12 ft. long including the thyrsoid panicle. Flowers yellowish green, 3 in. long. Stamens twice as long as the perianth-segments.

Hab. Mexico. Described from a plant in the Peacock collection in 1872, and the inflorescence from Zuccagni. The name *Theometel* goes back to Morison, and Kunth cites for it figures by Munting and Ray. I cannot distinguish from this what I have seen in English gardens under the name of *A. Beaulauriana* Jacobi.

57. *A. COCCINEA* Roezl; Jacobi, Monogr. 76.—Acaulescent. Leaves 20-30 in a dense rosette, oblanceolate-spathulate,  $1\frac{1}{2}-2$  ft. long, 4-6 in. broad two-thirds of the way up, narrowed to 3 in. above the dilated base, dark green, only slightly glaucous when young, the hard pungent end-spine  $1\frac{1}{2}$  in. long, the edge repand between the close irregular deltoid-cuspidate prickles, which are  $\frac{1}{6}-\frac{1}{4}$  in. long. Inflorescence unknown.

Hab. Mexico; introduced into cultivation by Roezl in 1859. Described from plants seen at Kew, Reigate, and Hammersmith. I cannot distinguish specifically a plant received at Kew in 1883 from Leichtlin, labelled *A. gracilispina*. Var. *brevifolia* Hort., is a dwarf form.

58. *A. MAXIMILIANA* Baker in Gard. Chron. 1877, ii. 202. *A. Gustaviana* Hort.—Acaulescent. Leaves about 20 in a rosette, oblanceolate-spathulate,  $1\frac{1}{2}-2$  ft. long,  $2\frac{1}{2}-3$  in. broad above the middle, narrowed to  $1\frac{1}{2}-2$  in. above the base, a slightly glaucous

green, the pungent brown-black end-spine an inch long, the bright chestnut-brown prickles larger and more irregular than in *americana*, with longer and sharper cusps, at most  $\frac{1}{4}$  in. long. Inflorescence unknown.

Hab. Probably Mexico. Described from specimens seen at Kew and Reigate, the former sent by Mr. Justus Corderoy.

59. *A. (Euagave) MEXICANA* Lam. Encyc. i. 52; Ricasoli in Gard. Chron. 1883, i. fig. 22.—Acaulescent. Leaves 20–30 in a rosette, oblanceolate-spathulate, 2–3 ft. long, 5–6 in. broad above the middle, narrowed to 3–4 in. above the base, very glaucous, the brown pungent point an inch long, the subdistant deltoid-cuspidate prickles  $\frac{1}{8}$ – $\frac{1}{6}$  in. long. Peduncle 18 ft. long, including the 7–8 ft. thyrsoid panicle. Flowers  $2\frac{1}{2}$ –3 in. long; tube  $\frac{1}{2}$ – $\frac{3}{4}$  in.; segments greenish yellow, under an inch long. Capsule 2 in. long.

Hab. Mexico. Frequent in European gardens. The above description is made from specimens at Kew and Reigate, and of the inflorescence from a plant that flowered in 1855 at Brussels. Baron Ricasoli's plant, grown in the open air at Florence, had above 100 leaves reaching a length of 4 ft. and a peduncle 23 ft. long, with 46 branches. I cannot distinguish specifically *A. cyanophylla* Jacobi.

60. *A. (Euagave) AMERICANA* Linn. Sp. Plant. 461; Andr. Bot. Rep. t. 438; Bot. Mag. t. 3654.—Acaulescent. Leaves usually 30–40, sometimes 50–60 in a rosette, oblanceolate-spathulate, 3–6 ft. long, 6–9 in. broad above the middle, narrowed to 4–5 in. above the base, glaucous green, the pungent brown end-spine,  $1\frac{1}{2}$ –2 in. long, the edge repand between the distant unequal middle-sized deltoid-cuspidate prickles. Peduncle with panicle 24–36 ft. long, the latter with 20–40 branches, the lower a foot long. Flower reaching a length of 3– $3\frac{1}{2}$  in.; tube funnel-shaped,  $\frac{1}{2}$  in. long; segments yellowish, 1– $1\frac{1}{4}$  in. long. Stamens twice as long as the segments. Capsule oblong, 2 in. long.

Hab. Widely spread in Tropical America and now introduced in many parts of the Old World. It is said to have been introduced into Europe about the middle of the 16th century, and to have first flowered in England at Hampton Court in 1714. For a full account of its history see a paper by Danielli in Nuov. Giorn. Bot. Ital. xvii. p. 49–138, tabs. 5–10. Martius (Fl. Bras. iii. 185) enumerates fifty books in which it is mentioned between 1554 and 1748. *A. Milleri* Haw. (*A. virginica* Miller non Linn.) is a dwarf variety, and *A. picta* Salmdyck and *A. ornata* Jacobi forms with variegated leaves. I cannot from the descriptions distinguish clearly *A. Fuerstenbergii* and *expansa* Jacobi.

#### Group 5. RIGIDÆ.

61. *A. DECAISNEANA* Jacobi, Nacht. 28.—Acaulescent. Leaves oblong-spathulate, about 14 in. long, 3 in. broad at the middle, narrowed to 2 in. above the base, a light rather shining green, the face concave, the end-spine strong and nearly black, the edge margined by crowded minute deltoid black teeth, which are rather recurved at the tip. Inflorescence unknown.

Hab. Mexico. Introduced about 1869. Described by Jacobi from a specimen in the Jardin des Plantes at Paris.

62. *A. WARELLIANA* Baker in Gard. Chron. 1877, ii. 264, fig. 53.—Acaulescent. Leaves about 30 in a rosette, oblong-spathulate,

9-10 in. long, 3 in. broad above the middle, narrowed to 2 in. above the base, nearly flat on the face, green, scarcely at all glaucous, tipped with a strong brown end-spine an inch long, margined with close very small deltoid prickles, which are red-brown when young and nearly black when old. Inflorescence unknown.

Hab. Probably Mexico. Described from the Saunders collection at Reigate, in 1872.

63. *A. (Littæa) MACRANTHA* Todaro, Hort. Bot. Panorm. ii. 11, t. 27.—Acaulescent. Leaves 40—50, oblong-spathulate, 5-6 in. broad at the middle, 2-3 in. above the base, dull glaucous green, the face concave, the pungent end-spine an inch long, the young leaves thinly edged with brown, the teeth small, deltoid-cuspidate, moderately close. Peduncle with dense spike 4-5 ft. long. Flowers 3 in. long; tube funnel-shaped,  $\frac{1}{2}$  in. long. Stamens about three times the length of the segments.

Hab. Probably Mexico. Flowered with Dr. Todaro at the Palermo Botanic Garden, in 1879.

64. *A. (Littæa) BOTTERI* Baker in Bot. Mag. t. 6248; Gard. Chron. 1877, ii. fig. 54.—Acaulescent. Leaves about 50 in a rosette, oblong-spathulate, 2 ft. long, 6 in. broad above the middle, narrowed to 4-4 $\frac{1}{2}$  in. above the base, pale green, hardly at all glaucous, the pungent end-spine  $\frac{1}{2}$  in. long, the crowded nearly black deltoid teeth not more than  $\frac{1}{8}$  in. long. Peduncle with dense 2-3 ft. spike 7-8 ft. long. Flowers 2 $\frac{1}{2}$  in. long; tube  $\frac{1}{4}$ - $\frac{1}{3}$  in. long. Stamens more than twice as long as the segments.

Hab. Mexico. Sent by Botteri by Mr. Wilson Saunders. Flowered with Mr. J. T. Peacock, in the spring of 1875.

65. *A. (Euagave) RIGIDA* Miller, Gard. Dict. No. 8; Engelm. Notes, 28. *A. ixtli* Karw. *A. Karwinskii* Zuccar. *A. ixtlioides* Hook. in Bot. Mag. t. 5893. *Fourcroya rigida* Haw.—Acaulescent or shortly caulescent. Leaves 30-40 in a rosette, ensiform, 1 $\frac{1}{2}$ -2 ft. long, 1 $\frac{1}{2}$ -2 in. broad at the middle, narrowed to an inch above the base, rigidly erecto-patent, glaucous, the pungent end-spine an inch long, the subdistant dark brown or nearly black deltoid teeth not more than  $\frac{1}{8}$  in. long. Peduncle, including thyrsoid panicle, 12-15 ft. long. Flowers 1 $\frac{1}{2}$ -2 in. long; tube very short; segments narrow, greenish, an inch long. Stamens twice as long as the segments. Capsule 1 $\frac{1}{2}$ -2 in. long.

Var. *A. ELONGATA* Jacobi, Monogr. 108. *A. fourcroyoides* Jacobi. *A. ixtlioides* Lemaire. *A. rigida* var. *longifolia* Engelm. *A. Candelabrum* Todaro, Hort. Bot. Panorm. i. 66, t. 15.—Leaves 100 to a rosette, 3-4 ft. long, 4-5 in. broad. Peduncle including ample thyrsoid panicle 20-25 ft. long.

Var. *SISALANA* Engelm. Notes, 28.—Trunk short.—Leaves 4-6 ft. long, 4-6 in. broad, generally without teeth. Peduncle including panicle 25-30 ft. long.

Hab. South Mexico; Provinces of Vera Cruz, Yucatan, &c. This is the species which yields the most valuable fibre, for a full account of which see Morris in 'Kew Bulletin,' No. 3. The export from Yucatan in 1883 was worth £658,000. *A. rigida* Miller was named from a dwarf form with entire leaves.

What is probably the same is amongst the unpublished drawings at the British Museum made from the Syrhagen Garden in 1720, under the name of "*Aloe pita foliis non spinosis*." My description of the typical form refers to the plant as commonly grown in English and Belgian Gardens. The little-known *A. angustifolia* Haworth is probably a form of this species. We have received it lately in flower from Demerara and Central Madagascar. We have a photograph from Dr. Todaro of a plant in flower which is probably *sisalana* grown as *A. brevis* at the Palermo Garden.

66. *A. CORDEROYI* Baker in Gard. Chron. 1877, ii. 399, fig. 79. —Acaulescent. Leaves 40–50 in a dense rosette, ensiform, rigidly erecto-patent,  $1\frac{1}{2}$  ft. long, an inch broad above the middle, narrowed to  $\frac{3}{4}$  in. above the base, slightly channelled down the face, bright green, the pungent end-spine an inch long, the sub-distant erecto-patent, deltoid-cuspidate dark brown spines of the edge  $\frac{1}{8}$  in. long. Inflorescence unknown.

Hab. Mexico, introduced by Roez. Named after Mr. Corderoy by De Smet, from whose establishment at Ledeborg-lez-Gand, in Belgium, a great many of the plants in the Saunders and Peacock collections were purchased.

67. *A. (Euagave) PRINGLEI* Engelm.—Leaves ensiform, very rigid, 15–18 in. long, the dilated base 3–3½ in. broad, narrowed gradually from 2 in. above the base to the pungent apex, the distant marginal prickles small, brown, deltoid-cuspidate, hooked. Flower  $1\frac{1}{2}$  in. long; tube short, subcylindrical; segments narrow, yellow,  $\frac{1}{2}$  in. long. Stamens twice as long as the segments. Capsule oblong, 1–1½ in. long.

Hab. Central mountains of Lower California, alt. 6000 ft., *Orcutt!* Described from a dried specimen sent to Kew by Mr. C. G. Pringle. We have a specimen of an allied plant that flowered with Mr. J. T. Peacock in 1881, that was labelled *A. scaberrima*.

68. *A. (Euagave) EXCELSA* Jacobi, Monogr. 238. — Shortly caulescent. Leaves about 30 in a rosette, ensiform, rigid, 2 ft. long, 2 in. broad at the middle, green when fully mature, slightly glaucous when young, the pungent end-spine,  $\frac{1}{2}$  in. long, the prickles small, nearly black, deltoid-cuspidate, distant. Peduncle with thyrsoïd panicle 12–15 ft. long. Flowers like those of *A. rigida*.

Hab. Mexico. Described from a plant flowered at the Glasgow Botanic Garden in August, 1884, by Mr. Bullen.

69. *A. REGELIANA* Jacobi, Monogr. 236.—Acaulescent. Leaves oblanceolate,  $1\frac{1}{2}$  ft. long,  $2\frac{3}{4}$  in. broad above the middle, narrowed to  $1\frac{3}{4}$  in. above the base, a light pruinose green, the face slightly concave, the end-spine pungent, the marginal teeth very minute, crowded, colourless. Inflorescence unknown.

Hab. Mexico. Described by Jacobi in 1865, from a plant shown by Messrs. Glynn, of Utrecht, at the Amsterdam Exhibition. I cannot clearly separate *A. ananassoides* De Jonghe and Jacobi, Nacht. 32, of which we have a photograph in the Element series. The plant which usually does duty under the name of *Regeliana* in gardens is *A. horrida* Lemaire.

70. *A. (Euagave) MIRADORENSIS* Jacobi, Nacht. 31.—Acaulescent. Leaves about 30 in a rosette, oblanceolate,  $2\frac{1}{2}$ –3 ft. long,  $2\frac{1}{2}$  in. broad above the middle, narrowed to  $1\frac{1}{2}$ –2 in. above the base, bright pale green, glaucous when young, the pungent chestnut-

brown end-spine an inch long, the prickles very minute, deltoid, hardly at all horny. Peduncle including 5-6 ft. thyrsoid panicle 23 ft. long. Flowers 2 in. long; tube very short; segments under an inch long. Stamens twice as long as the segments.

Hab. Mexico. Described by Jacobi from the Belgian Gardens in 1867. The above description and three sketches, now in the Kew Herbarium, were made from a plant that flowered with Mr. J. T. Peacock, at Hammersmith, in December, 1877. I cannot by the description separate the earlier-named *A. Desmetiana* Jacobi Monog. 241.

71. *A. (Littaa) POLYACANTHA* Haw. Revis. Succ. 35. *A. wala-pensis* Roezl. *A. uncinata* and *chiapensis* Jacobi.—Acaulescent. Leaves about 30 in a rosette, oblanceolate, 1-2 ft. long, 3-5 in. broad above the middle, narrowed to 2-3 in. above the base, bright green, only slightly glaucous in an early stage, the dark brown shortly decurrent end-spine  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, the crowded dark brown irregular patent deltoid prickles not more than 1-12th to 1-8th in. long. Peduncle 8-12 ft. long, including the dense 3-4 ft. spike. Flower  $1\frac{1}{2}$ -2 in. long; tube subcylindrical,  $\frac{1}{3}$  in. long; segments  $\frac{3}{4}$  in. long, yellowish brown. Filaments more than twice as long as the segments.

Hab. Mexico. Introduced into cultivation about 1820. We have lately received it from Trinidad, from Mr. Hart. A plant from the Saunders collection flowered with Mr. F. Pawle, at Reigate, in 1875.

72. *A. (Littaa) DENSIFLORA* Hook. in Bot. Mag. t. 5006.—Acaulescent. Leaves 30-40 in a rosette, oblanceolate-spathulate, 2-3 ft. long, 3-5 in. broad above the middle, narrowed to  $2\frac{1}{2}$ -4 in. above the base, bright green when mature, only slightly glaucous when young, the pungent shortly decurrent end-spine  $\frac{1}{2}$  in. long, the irregular crowded bright brown spreading deltoid prickles  $\frac{1}{2}$ -1 line long. Peduncle including the dense spike 6-8 ft. long. Flowers  $1\frac{1}{2}$ -2 in. long; tube funnel-shaped,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long; segments lanceolate, greenish brown,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Stamens 2 in. long. Capsule  $\frac{3}{4}$ -1 in. long.

Hab. Mexico. First described by Sir W. J. Hooker, from a plant that flowered at Kew in 1857. It has since often flowered, both at Kew and Reigate.

73. *A. (Euagave) LURIDA* Ait. Hort. Kew, i. 472; Gawl. in Bot. Mag. t. 1522; Baker in Saund. Ref. Bot. t. 307. *A. vera-cruz* Miller, an earlier name, altered by Haworth to *vera-crucis*.—Acaulescent or shortly caulescent. Leaves 30-40 in a rosette, oblanceolate, 2-3 ft. long,  $2\frac{1}{2}$ - $3\frac{1}{2}$  in. broad above the middle, narrowed to 2 in. above the base, very glaucous, the pungent end-spine an inch long, the subdistant deltoid prickles  $\frac{1}{3}$  in. long, at first red-brown, finally nearly black. Peduncle including the 3-6 ft. thyrsoid panicle 12-16 ft. long. Flowers 3 in. long; tube broadly funnel-shaped,  $\frac{1}{2}$  in. long; segments greenish yellow, narrow, an inch long. Stamens twice as long as the segments. Capsule  $1\frac{3}{4}$ -2 in. long.

Var. *A. JACQUINIANA* Schult. Syst. Veg. vii. 727; Hook. in Bot. Mag. t. 5097; Belg. Hort. ix. t. 25. *A. lurida* Jacq. Collect. iv. 94, t. 1.—Trunk 1- $1\frac{1}{2}$  ft. long. Leaves  $2\frac{1}{2}$ -3 ft. long. Flowers small.

Hab. Mexico, the most widely-spread species next to *A. americana*. It was figured by Commelinus in 1706. The above description was made from a plant that flowered with Mr. Wilson Saunders in 1870. We have it in flower from Madras (1810), Coimbra (1881), and Hong-Kong (1882). A leaf, 6 ft. long and 7 in. broad, sent from the Bahamas by the Colonial Secretary in 1887, apparently belongs to this species.

74. *A. SALMDYCKII* Baker in Gard. Chron. 1877, ii. 490. *A. Keratto* Salmdyck et Jacobi non Miller.—Acaulescent. Leaves 40–50 in a rosette, oblanceolate, 4–5 ft. long, 5–6 in. broad above the middle, narrowed to 4–5 in. above the base, bright green, the end-spine scarcely pungent, the crowded minute deltoid-cuspidate dark-brown spines not more than 1-12th in. long. Inflorescence unknown.

Hab. Mexico. Described from living plants at Kew and Reigate in 1872.

75. *A. (Euagave) MORRISII* Baker in Gard. Chron. 1887, i. 643, fig. 105.—Acaulescent. Leaves 20–30 in a rosette, oblanceolate-spathulate, 4–6 ft. long,  $\frac{1}{2}$ –1 ft. broad above the middle, narrowed to 4–6 in. above the base, green, hardly at all glaucous, quite smooth on both surfaces, the pungent end-spine an inch long, the subdistant deltoid-cuspidate dark brown prickles  $\frac{1}{8}$ – $\frac{1}{6}$  in. long. Peduncle including the thyrsoid panicle 15–20 ft. long; branches 30–50, the lower horizontal, above a foot long. Flowers 2–2 $\frac{3}{4}$  in. long; tube short; segments bright yellow, an inch long. Stamens nearly twice as long as the segments. Capsule an inch long.

Hab. Jamaica, confused by Grisebach and others with *A. americana*. The data for describing it have been collected by Mr. Morris, now Assistant-Director of Kew Gardens, during his residence in the island, and he has also introduced into cultivation at Kew both the type and a fine form with variegated leaves.

#### Group 6.—STRIATÆ.

76. *A. (Littæa) STRIATA* Zuccar. in Nova Acta xvi. 2, 678; Hook. in Bot. Mag. t. 4950.—Acaulescent or shortly caulescent. Leaves 150–200 in a dense rosette, linear from a very dilated base, 2–2 $\frac{1}{2}$  ft. long,  $\frac{1}{4}$ – $\frac{1}{3}$  in. broad above the base, narrowed gradually to the brown pungent tip, scabrous on the edge, glaucous green, the face rather raised, the back subtriquetrous, both surfaces marked with close vertical ribs. Peduncle including the dense 2–3 ft. spike 6–8 ft. long. Flowers 1–1 $\frac{1}{2}$  in. long; tube broadly funnel-shaped, about equalling the brownish-green oblong segments. Stamens purple, 1 $\frac{1}{2}$  in. long, inserted low down in the tube. Capsule oblong-trigonal,  $\frac{1}{2}$  in. long.

Var. *A. RECURVA* Zuccar. *loc. cit.*—Leaves larger and more falcate than in the type, reaching 3–4 ft. End-spine not pungent.

Var. *A. STRICTA* Salmdyck. *A. Hystrix* Hort.—Leaves very stiff, about a foot long, more convex on the face.

Var. *A. ECHINODES* Jacobi, Nacht. 48. *A. ensiformis* and *Richardsii* Hort.—Still dwarfer and stiffer than var. *stricta*, the leaves only half a foot long,  $\frac{1}{3}$  in. broad at the middle.

Hab. Mountains of Mexico, now common in cultivation under a large number of forms. It was figured in the 'Botanical Magazine' from a plant that flowered at Kew in 1856, sent from Real del Monte by Mr. Repper. We have two photographs of a plant that flowered with Signor Fenzi at Florence in

October, 1876. Dr. Palmer got it lately in Coahuila. It sometimes passes muster in gardens as *Yucca hystrix*, and sometimes as *Dasyliroion junceum*. A quadrilocular capsule has lately been figured by Terracino in Nuov. Giorn. Bot. Ital. xvii. t. 19.

77. *A. (Littæa) FALCATA* Engelm. Notes, 16. *A. californica* Jacobi.—Acaulescent. Leaves 20–30 in a rosette, linear,  $1\frac{1}{2}$ –2 ft. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad above the dilated base, rigid, glaucous, narrowed gradually to the horny brown pungent tip, scabrous on the margin, distinctly keeled on the face, subtriquetrous on the back, distinctly striated on both surfaces. Peduncle 4–8 ft. long, including the lax spike. Flowers 1– $1\frac{1}{4}$  in. long; tube broadly funnel-shaped, nearly as long as the oblong segments. Stamens  $1\frac{1}{2}$ –2 in. long, inserted at the middle of the tube. Capsule oblong-trigonal,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long.

Hab. Mexico; mountains of Coahuila. *Palmer* 1314, *Pringle*! Discovered by Drs. Wislizenus and Gregg in 1846–1848. Introduced into cultivation about 1867. It was first described by Jacobi from a living plant at Kew. It is not known to grow in California.

78. *A. (Littæa) PAUCIFOLIA* Todaro, Hort. Bot. Panorm. i. 77, t. 19.—Acaulescent. Leaves few, rigid, linear,  $1\frac{1}{2}$  ft. long,  $\frac{1}{2}$  in. broad, finely striated, convex on the face, scabrous on the margin, pungent at the apex, the base suddenly dilated. Peduncle slender, about 4 ft. long. Flowers few, subspicate, greenish,  $1\frac{1}{2}$  in. long; limb as long as the ovary; tube equalling the oblong segments. Stamens purplish, 1– $1\frac{1}{2}$  in. long.

Hab. Probably Mexico. Described by Dr. Todaro from a plant that flowered at the Palermo Botanic Garden in 1877.

79. *A. (Littæa) DASYLIROIDES* Jacobi and Bouché, Monogr. 150; Hook. in Bot. Mag. t. 5716; Baker in Gard. Chron. 1877, 2, fig. 111. *A. dealbata* Lemaire.—Acaulescent. Leaves 80–100 in a dense rosette, linear, very glaucous,  $1\frac{1}{2}$ –3 ft. long,  $\frac{3}{4}$ –1 in. broad above the dilated base, stiffly erecto-patent or falcate, flat on the face and hardly at all convex on the back, narrowed gradually from the middle to a short pungent point, serrulate on the margin, finely striated vertically on both surfaces. Peduncle 10–12 ft. long, including the long dense often cernuous spike. Flowers  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. long; tube broadly funnel-shaped,  $\frac{1}{3}$  in. long; segments yellow, twice as long as the tube. Stamens  $1\frac{1}{2}$  in. long.

Hab. Mexico. Figured in the 'Botanical Magazine' from a plant that flowered at the Regent's Park in January, 1868. It has since flowered several times both at Reigate and Kew, the last time in 1887.

#### GROUP 7.—INTEGRIFOLIÆ.

80. *A. INTEGRIFOLIA* Baker.—Acaulescent. Leaves about 30 in a dense rosette, rigid, oblanceolate, recurving, very glaucous, entire, 5–6 in. long, 1– $1\frac{1}{2}$  in. broad above the middle, narrowed gradually to the base and suddenly to a brown pungent end-spine  $\frac{1}{4}$  in. long, the margin entire. Inflorescence unknown.

Hab. Mexico. Described from a plant received at Kew from the Missouri Botanic Garden in 1885.

81. *A. (Euagave) NEWBERRYI* Engelm. Notes, 21.—Acaulescent. Leaves ensiform, 7–10 in. long,  $\frac{3}{4}$  in. broad above the dilated base, rigid, entire, narrowed gradually to a pungent brown end-spine  $\frac{1}{2}$  in. long. Peduncle slender, 8 ft. long. Panicle narrow, lax; branches 1–3 in. apart, 1–2 in. long, bearing each 2–5 flowers, which are only an inch long, including the ovary, with a short tube and oblong segments. Stamens but little exerted, inserted low down in the tube.

Hab. Mountains of North-West Arizona, alt. 4000 ft., discovered by Dr. J. S. Newberry in March, 1848.

82. *A. HOULLETHI* Jacobi, Monogr. 256.—Acaulescent. Leaves 30–40 in a rosette, oblanceolate, 1–1 $\frac{1}{2}$  ft. long, 2 in. broad above the middle, narrowed to an inch above the dilated base, bright green, glaucous on the back towards the base, quite entire on the margin, the pungent end-spine  $\frac{1}{2}$  in. long. Inflorescence unknown.

Hab. Probably Mexico. Described by Jacobi from the Belgian Gardens in 1865. I have seen it alive both at Kew and Reigate. It may be an extreme variety of *A. rigida*.

#### Group 8.—GEMINIFLORÆ.

83. *A. (Littæa) GEMINIFLORA* Gawl. in Brandes Journ. iii. t. 1; Bot. Reg. t. 1145; Reich. Ic. Exot. t. 209–210; Spin. in Cat. Hort. Sebast. 1823, 3, with figure. *Littæa geminiflora* Tagl.—Acaulescent. Leaves 200–300 in a dense rosette, recurved, linear, 1 $\frac{1}{2}$ –2 ft. long,  $\frac{1}{8}$ – $\frac{1}{4}$  in. broad at the middle, bright green, convex on both sides, not striated, the pale edge splitting off into fine threads, the tip slightly pungent. Peduncle 18–24 ft. long, including the dense spike. Flowers 1 $\frac{3}{4}$ –2 in. long; tube sub-cylindrical,  $\frac{1}{3}$  in. long; segments linear, greenish brown, twice as long as the tube. Filaments twice as long as the segments.

Hab. Mexico, introduced into cultivation in 1797. It first flowered in 1815 in the garden of Count Von Litta, after whom the genus *Littæa* was named. It is often found in English gardens under the name of *Bonapartea juncea*, and has also been called *Dracæna Boscii* and *Yucca Boscii*. *A. Taylori* Hort. Williams (Gard. Chron. 1877 ii. 125) is a garden hybrid, of which *geminiflora* is one parent and *filamentosa* (not *densiflora*, as has been stated) probably the other.

#### Group 9.—ALOIDEÆ.

84. *A. REGIA* Baker in Gard. Chron. 1877, ii. 620, fig. 124. *A. revoluta* Hort. Peacock.—Acaulescent. Leaves 12–15 in a rosette oblong-spathulate, 1 $\frac{1}{4}$ –1 $\frac{1}{2}$  ft. long, 4–5 in. broad at the middle, narrowed to 2–3 in. above the base, bright green on the flat face, the subpungent brown tip  $\frac{1}{2}$  in. long, the prickles moderately close, brown, deltoid, not more than 1–12th inch long, the upper ascending, the lower deflexed. Inflorescence unknown.

Hab. Probably Mexico. Seen alive in the Kew, Reigate, and Hammer-smith collections.

85. *A. MELANACANTHA* Lemaire; Jacobi, Monogr. 117.—Acaulescent. Leaves few in a rosette, oblong-spathulate, about a foot

long, 4 in. broad at the middle, narrowed to 2 in. above the base, a light opaque green, the end-spine short and brown, the teeth subdistant, minute, brown, deltoid-cuspidate. Inflorescence unknown.

Hab. Probably Mexico. Described by Jacobi from a plant exhibited at the Ghent Exhibition of 1863.

86. *A. (Euagave) WILDINGII* Todaro, Hort. Bot. Panorm. t. 32.—Acaulescent. Leaves few, oblong-spathulate, bright green, 6–7 in. broad at the middle; end-spine short, not pungent; teeth small, close, deltoid-cuspidate, dark brown. Peduncle 4–5 times the length of the leaves. Panicle lax, about as long as the peduncle. Flowers  $1\frac{1}{2}$  in. long; tube very short; segments yellowish, as long as the ovary. Stamens twice as long as the segments.

Hab. Probably Mexico. Figured lately by Dr. Todaro from the Palermo Botanic Garden.

87. *A. RUDIS* Lemaire; Jacobi, Monogr. 118. *A. Malinezii* K. Koch.—Shortly caulescent. Leaves few, oblong-spathulate, 15 in. long, 5–6 in. broad at the middle, narrowed to 2 in. above the base, a light opaque green on the concave face, the end-spine short, brown, the teeth moderately distant, minute, brown, deltoid-cuspidate, recurved. Inflorescence unknown.

Hab. Probably Mexico. Described by Jacobi in 1864 from a living plant in the garden of Herr Tonel, at Ghent.

88. *A. LAURENTIANA* Jacobi, Monogr. 254.—Acaulescent. Leaves moderately numerous, oblong-spathulate,  $\frac{1}{2}$ –2 ft. long, 5–6 in. broad above the middle, narrowed to 3 in. above the base, the face opaque green and deeply concave, the end-spine short, stout and brown, the edge slightly repand between the minute straight brown deltoid teeth. Inflorescence unknown.

Hab. Probably Mexico. Described by Jacobi in 1865 from a plant in the collection of Herr Laurentius, at Leipsic.

89. *A. OFFOYANA* Jacobi, Monogr. 116.—Acaulescent. Leaves 25–30 in a rosette, oblong-spathulate,  $1\frac{1}{2}$ –2 ft. long, 4–5 in. broad above the middle, narrowed to 3 in. above the base, deeply concave on the bright-green face, the subpungent end-spine  $\frac{1}{2}$  in. long, the teeth moderately close, brown, deltoid, 1–12th to 1–8th in. long. Inflorescence unknown.

Hab. Cuba. My notes are taken from a plant seen at Reigate in August, 1872. It was described by Jacobi from the collection of Madame Legrelle d'Hanis at Antwerp, in 1862.

90. *A. (Littæa) CELSIANA* Hook. in Bot. Mag. t. 4934.—Acaulescent. Leaves 20–30 in a rosette, oblong-spathulate,  $1\frac{1}{2}$ –2 ft. long, 4–5 in. broad, the middle narrowed to  $2\frac{1}{2}$ –3 in. above the base, the persistently glaucous face flat in the middle, the end-spine slightly pungent, the crowded lanceolate spines very unequal both in shape and size, 1–12th to 1–8th in. long, only the largest brown and horny at the tip, those below the middle of the blade deflexed. Peduncle 5–6 ft. long, including the short dense spike. Flowers  $1\frac{1}{2}$ –2 in. long; tube very short; segments purplish green, lanceolate,  $\frac{3}{8}$ – $\frac{3}{4}$  in. long. Filaments  $1\frac{1}{2}$ –2 in. long.

Hab. Mexico. Described by Sir W. J. Hooker from a plant that flowered at Kew in May, 1856, received from M. Cels, of Paris. It flowered again in the summer of 1879, and a small variety with leaves only 8—9 in. long, with Mr. Corderoy in July, 1883.

91. A. (*Littæa*) EHRENBERGII Jacobi, Monogr. 136.—Acaulescent. Leaves moderately numerous, oblong-spathulate,  $1\frac{1}{2}$ –2 ft. long, 5 in. broad above the middle, narrowed to  $2\frac{1}{2}$  in. above the base, an opaque rather glaucous green on the concave face, the brown end-spine short, the crowded minute deltoid marginal teeth brown at the tip only. Peduncle 4–5 ft. long. Flowers  $1\frac{1}{2}$  in. long; tube short; segments linear-oblong, above  $\frac{1}{2}$  in. long. Filaments above 2 in. long.

Hab. Mexico. Described by Jacobi from plants seen at Berlin and Erfurt in 1864. It flowered with Herr Allardt at Berlin in 1867. I cannot from the description separate specifically *A. Legrelliana* Jacobi, Monogr. 253.

92. A. LINDLEYI Jacobi, Nacht. 37.—Trunk  $1\frac{1}{2}$  ft. long below the rosette of leaves. Leaves numerous, oblong-spathulate, 6–7 in. broad at the middle, narrowed to 3– $3\frac{1}{2}$  in. above the base, very thick, flat in the middle, glaucous, the end-spine dark brown, the marginal prickles close, deltoid, with a horny black tip. Inflorescence unknown.

Hab. Mexico, described by Jacobi from a plant seen in the collection of Mr. Wilson Saunders in 1867.

93. A. (*Littæa*) GOEPPERTIANA Jacobi, Monogr. 243.—Stem reaching a length of half a foot. Leaves 20–30 in a rosette, oblanceolate-oblong, 4–5 in. broad at the middle, narrowed to  $3$ – $3\frac{1}{2}$  in. above the base, bright green, the short brown tip scarcely pungent, the crowded spreading brown deltoid teeth under a line long. Peduncle including the dense 4–5 ft. spike 8–9 ft. long. Flower nearly 2 in. long; tube as long as the oblong segments. Stamens 2 in. long. Capsule  $\frac{3}{4}$  in. long.

Hab. Probably Mexico. Described by Jacobi in 1865 from plants seen at Breslau and Reigate, the former of which flowered in 1874, and is figured in the 'Index Seminum' for that year of the Breslau Garden, of which Dr. Goeppert was Director.

94. A. (*Littæa*) HORIZONTALIS Jacobi, Nacht. 33.—Caulescent. Leaves few in a rosette, oblanceolate-oblong, 2 ft. long, 4–5 in. broad at the middle, narrowed to  $2\frac{1}{2}$  in. above the base, the broad channelled face bright light green, glaucous when young, the subpungent brown end-spine short, the marginal teeth crowded, minute, brown, deltoid. Peduncle including the dense 2– $2\frac{1}{2}$  in. spike 6–7 ft. long. Flowers under 2 in. long; segments oblong, reddish brown, about as long as the broadly funnel-shaped tube. Stamens 2– $2\frac{1}{2}$  in. long.

Hab. Probably Mexico. Described by Jacobi in 1865 from a plant that flowered in the collection of Von Elemeet, of which we have a photograph.

95. A. SMITHIANA Jacobi, Monogr. 250.—Acaulescent. Leaves about 30 in a rosette, oblanceolate-oblong, 2– $2\frac{1}{2}$  ft. long, 4–5 in. broad at the middle, narrowed to 2– $2\frac{1}{2}$  in. above the base, bright green on the flat face, the subpungent brown tip  $\frac{1}{2}$  in. long, the close deltoid brown marginal prickles 1–12th in. long. Inflorescence unknown.

Hab. Mexico; San Luis, Potosi. Described by Jacobi from a plant seen at Kew in 1865, which is still there and has never flowered. I cannot clearly separate from the descriptions *A. lamprochlora* and *A. per lucida* Jacobi.

96. *A. HUMBOLDTIANA* Jacobi, Monogr. 251. — Acaulescent. Leaves 30–40 in a rosette, oblanceolate-oblong, 2½–3 ft. long, 5–6 in. broad above the middle, narrowed to 3 in. above the base, bright green, slightly glaucous when young, the subpungent brown end-spine ½ in. long, the close very minute deltoid marginal prickles tipped with brown. Inflorescence unknown.

Hab. Mexico; San Luis, Potosi. Described by Jacobi from a plant seen at Kew in 1865, which is still there and has never flowered.

97. *A. KEWENSIS* Jacobi, Monogr. 242. — Trunk ½ ft. long below the rosette of leaves. Leaves 30–40 in a rosette, oblanceolate-oblong, 3½–4 ft. long, 7–8 in. broad above the middle, narrowed to 4 in. above the base, bright green, the subpungent end-spine short and brown, the face concave in the middle, the marginal prickles small, close, brown, deltoid. Inflorescence unknown.

Hab. Mexico. Described by Jacobi from a plant seen at Kew in 1865, which is still there.

98. *A. (Littaa) SARTORII* K. Koch Wochen. 1860, 37; Bot. Mag. t. 6292. *A. Noackii* and *rufocincta* Jacobi. *A. pendula* Schmitt. *A. caspitosa* Todaro, Hort. Bot. Panorm. t. 8. — Trunk 1–2 ft. long, sometimes forked. Leaves 30–40, spaced out in a lax rosette, ensiform, 1½–2 ft. long, 3 in. broad at the middle, narrowed to 2–2½ in. above the base, bright green, with a pale band down the centre, the face flat, the end-spine small and not pungent, the minute, crowded deltoid spreading teeth tipped with red-brown. Peduncle lateral, including the 2–3 ft. often cernuous spike 6–8 ft. long. Flowers greenish, 1¼–1½ in. long; tube ½ in. long; segments lanceolate, ½ in. long. Stamens about three times as long as the segments, inserted at their base.

Hab. Mexico and Guatemala. Introduced about 1863. Frequent in cultivation. This is distinctly polycarpic, and flowers at Kew usually every year.

99. *A. (Littaa) OBLONGATA* Jacobi, Nacht. 40. — Acaulescent. Leaves 20–30 in a rosette, lanceolate, 2 ft. long, 3½ in. broad at the middle, narrowed to 3 in. above the base, light glaucous green, the face nearly flat in the centre, the end-spine small and weak, the marginal prickles close, minute, brown, deltoid. Peduncle 4 ft. long. Spike dense, twice as long as the peduncle. Flowers 1½ in. long; tube short. Stamens 2½ in. long. Capsule oblong, 1¼ in. long.

Hab. Probably Mexico. Described by Jacobi in 1868, from a plant in the collection of Herr Tonel at Ghent. Perhaps a mere variety of *micracantha*; the name is not appropriate.

100. *A. (Littaa) HASELOFFII* Jacobi, Monogr. 244. — Shortly caulescent. Leaves about 20 in a rosette, lanceolate, 1½–2 ft. long, 3 in. broad at the middle, narrowed to 2 in. above the base, bright light green, the subpungent brown end-spine ½ in. long, the marginal teeth close and brown, the central ones lanceolate, ⅓ in.

long, those of the lower two-thirds of the edge more or less deflexed. Peduncle 7 ft. long including the dense 2 ft. spike. Flowers green,  $1\frac{1}{2}$  in. long; tube short; segments  $\frac{1}{2}$  in. long. Filaments 2- $2\frac{1}{2}$  in. long.

Hab. Probably Mexico. Described by Jacobi in 1864, from a plant in the garden of the gentleman after whom it is named. I have seen it both at Kew and Reigate.

101. A. (*Littaa*) MUILMANNI Jacobi, Nacht. ii. 76. — Shortly caulescent. Leaves about 30 in a rosette, lanceolate, 2 ft. or more long, 2- $2\frac{1}{2}$  in. broad at the middle, bright green on the concave face, the end-spine subpungent and reddish brown, the marginal prickles crowded, minute, deltoid, red-brown. Peduncle including the short dense spike 4-5 ft. long. Flowers under  $1\frac{1}{2}$  in. long; tube very short; segments  $\frac{1}{2}$  in. long. Filaments  $1\frac{1}{4}$  in. long.

Hab. Probably Mexico. Described by Jacobi in 1871, from a plant in the collection of Herr Muilmann at Utrecht.

102. A. MARTIANA K. Koch, Wochen. 1860, 38.—Acaulescent. Leaves lanceolate, reaching a length of 2- $2\frac{1}{2}$  ft., 3- $3\frac{1}{2}$  in. broad at the middle, narrowed to  $2\frac{1}{2}$  in. above the base, a light opaque green, the face nearly flat, the end-spine short, the edge in the upper part furnished with a continuous brown line and minutely toothed, lower down furnished with irregular small deltoid brown teeth.

Hab. Probably Mexico. Described by Dr. Karl Koch from a plant in the Berlin Botanic Garden.

103. A. (*Euagave*) CARIBÆA Baker in Gard. Chron. 1877, ii. 683. —Acaulescent. Leaves about 30 in a rosette, lanceolate, 2- $2\frac{1}{2}$  ft. long, 3-4 in. broad at the middle, narrowed to  $2\frac{1}{2}$ -3 in. above the base, bright green, the face nearly flat, the weak brown end-spine  $\frac{1}{2}$  in. long, the marginal teeth close, very minute, all pale or only tinged with brown at the very tip. Inflorescence a thyrsoïd panicle. Flowers 2 in. long; tube very short; segments lanceolate, yellowish,  $\frac{3}{4}$  in. long. Filaments scarcely longer than the segments.

Hab. Martinique, *Hahn* 114! Inflorescence described from a dried specimen, received from Dr. Cosson in 1873. We have what I suppose to be the same species alive at Kew, but it has never flowered. The only other species of this group known to have a thyrsoïd panicle is *A. Wildingii*.

104. A. BERNHARDII Jacobi, Nacht. 38. — Shortly caulescent. Leaves oblanceolate, 7-8 in. long, 3 in. broad at the middle, narrowed to  $2\frac{1}{4}$  in. above the base, light bright green, the face rather concave, the chestnut end-spine short and slender, the teeth rather crowded, deltoid, cuspidate, castaneous, fragile, unequal. Inflorescence unknown.

Hab. Probably Mexico. Described by Jacobi about 1868, from a plant in the Leipsic Botanic Garden.

105. A. (*Littaa*) RUPICOLA Regel in Gartenfl. vii. 312.—Shortly caulescent. Leaves about 20 in a rosette, oblanceolate, 12-15 in. long,  $3\frac{1}{2}$ -4 in. above the middle, narrowed to  $2\frac{1}{2}$ -3 in. above the base, bright green, the end-spine small and weak, the edge irregularly jagged rather than toothed, the tips castaneous. Peduncle

7-8 ft. long including the dense 2 ft. spike. Flower under 2 in. long, segments oblong, yellowish, equalling the funnel-shaped tube. Stamens 2 in. long.

Hab. Mexico. Sent by Karwinski to the Petersburg Botanic Garden, where it flowered in 1863.

106. A. (*Littaa*) BOUCHEI Jacobi, Monogr. 120.—Trunk reaching a foot in length. Leaves 20-30 in a rosette, oblanceolate, 1-1½ ft. long, 3½-4½ in. broad at the middle, narrowed to 2½-3 in. above the base, bright light green, rather glaucous when young, the dark-brown subpungent end-spine ½ in. long, the brown deltoid teeth crowded and very minute. Peduncle about 6 ft. long. Flowers under 2 in. long, yellowish green; segments oblong, as long as the tubes. Stamens under 2 in. long.

Hab. Probably Mexico. Introduced to the Berlin Botanic Garden in 1861, and flowered there in 1864. I have seen it both at Kew and Reigate.

107. A. (*Littaa*) MICRACANTHA Salmдық in Bonpland. vii. 93; Baker in Saund. Ref. Bot. t. 327.—Shortly caulescent. Leaves 20-30 in a rosette, oblanceolate, 15-18 in. long, 3-5 in. broad above the middle, narrowed to 2-3 in. above the base, bright green, the face flattish, the end-spine red-brown and moderately firm, the copious close reddish-brown deltoid teeth 1-12th in. long. Peduncle including the dense 3-4 ft. spike 6-7 ft. long. Flowers 1½-1¾ in. long; segments oblong, yellowish, as long as the funnel-shaped tube. Stamens 2 in. long.

Hab. Mexico. Introduced about 1860, now frequent in cultivation. Described from a plant that flowered in 1870 with Mr. Wilson Saunders at Reigate. Flowered at Kew in 1867 and 1878.

108. A. (*Littaa*) MITIS Salmдық in Bonpland. vii. 93; Baker in Gard. Chron. 1877, ii. 717, fig. 137.—Shortly caulescent. Leaves about 30 in a rosette, oblanceolate, 12-15 in. long, 3 in. broad above the middle, narrowed to 2 in. above the base, bright green, flat in the middle, the end-spine weak, the crowded deltoid teeth very small, entirely green, or obscurely tipped with red-brown. Peduncle including the dense 3-4 ft. spike 9-10 ft. long. Flower about 2 in. long; segments oblong, about as long as the tube. Stamens above 2 in. long.

Hab. Mexico. Introduced about 1860. Flowered at Berlin in 1869, and by Mr. Thomas Hanbury, at Mortola, in 1877. Seen alive both at Kew and Hammersmith. Scarcely more than a variety of *A. micracantha*.

109. A. (*Littaa*) ALBICANS Jacobi, Monogr. 137; Baker in Gard. Chron. 1877, ii. 717, fig. 138. *A. Ousselghemiana* Jacobi.—Acaulescent. Leaves about 30 in a rosette, oblanceolate, 12-15 in. long, 3-4 in. broad at the middle, narrowed to 2-2½ in. above the base, persistently glaucous, with a small weak end-spine, the close deltoid brown horny teeth under a line long. Peduncle, including the dense 1½-2 ft. spike 5-6 ft. long. Flower 1½ in. long; segments greenish yellow, linear-oblong, twice as long as the funnel-shaped tube. Stamens under 2 in. long.

Hab. Mexico. Introduced above 1860. Flowered in 1867, by Count Kerchove d'Ousselghem, and in 1882 by Mr. Justus Corderoy, at Blewbury. Scarcely more than a variety of *micracantha*. There is a form with variegated leaves.

110. *A. THOMSONIANA* Jacobi, Monogr. 240.—Acaulescent. Leaves 30–40 in a rosette, oblanceolate-oblong, 12–15 in. long,  $3\frac{1}{2}$ – $4\frac{1}{2}$  in. broad above the middle, narrowed to  $2\frac{1}{2}$ –3 in. above the base, very bright green, the subpungent brown end-spine  $\frac{1}{2}$  in. long, the teeth close, red-brown, very irregular, the largest 1–12th in. long. Inflorescence unknown.

Hab. Mexico; San Luis Potosi. Described by Jacobi from a plant seen at Kew in 1865, and named in compliment to Dr. Thomson.

111. *A. WALLISII* Jacobi, Nacht. ii. 78.—Acaulescent. Leaves few, lanceolate, 9–10 in. long, 2 in. broad at the middle, narrowed to  $1\frac{1}{2}$  above the base, bright green, the short end-spine brown, the teeth crowded, minute, brown, deltoid. Inflorescence unknown.

Hab. Columbia, sent by Wallis to Linden in 1867.

112. *A. (Littæa) CHLORACANTHA* Salmdyck in Bonpland. vii. 93.—Trunk sometimes  $\frac{1}{2}$  ft. long. Leaves about 30 in a rosette, oblanceolate-oblong, 18–20 in. long, 4–5 in. broad above the middle, narrowed to  $2\frac{1}{2}$ –3 in. above the base, bright green, the end-spine small and weak, the very small close deltoid marginal teeth scarcely tipped with brown. Peduncle 5–6 ft. long, including the dense 2 ft. spike. Flowers  $1\frac{1}{2}$  in. long, bright green. Stamens above 2 in. long.

Hab. Mexico, introduced about 1860. Described from a plant of Mr. J. T. Peacock's, which flowered at Kew, March, 1882.

113. *A. BRAUNIANA* Jacobi, Monogr. 240.—Nearly acaulescent. Leaves 30–40 in a rosette, lanceolate, 15–18 in. long,  $2\frac{1}{4}$ – $2\frac{1}{2}$  in. broad at the middle, narrowed to  $1\frac{1}{2}$ – $1\frac{3}{4}$  in. above the base, bright green, the face flat in the centre, the subpungent brown end-spine  $\frac{1}{2}$  in. long, the moderately close deltoid-cuspidate brown teeth  $\frac{1}{2}$ –1 line long, sometimes confluent into a continuous brown border, the upper ones curved up and the lower down. Inflorescence unknown.

Hab. Mexico; San Luis Potosi. Described by Jacobi from a plant seen at Kew in 1865, which is still there and has never flowered.

#### Group 10.—SERRULATE.

114. *A. PRUINOSA* Lemaire; Jacobi, Monogr. 168. *A. Debaryana* and *Kellockii* Jacobi. *A. Gheisbreghtii* and *dentata* Hort.—Shortly caulescent. Leaves 10–20 in a rosette, spreading oblanceolate-oblong,  $1\frac{1}{2}$ –2 ft. long, 4–5 in. broad above the middle, narrowed to 2– $2\frac{1}{2}$  in. above the base, the face flat, pale glaucous green, the texture soft and fleshy, the end-spine not at all pungent, the edge furnished with irregular minute deltoid spreading pale green teeth not tipped with brown. Inflorescence unknown.

Hab. Mexico. Introduced by De Smet of Ghent in 1863. Habit of *attenuata*, from which it differs by its serrulate leaves.

115. *A. (Littæa) BRACTEOSA* S. Wats. in Proc. Amer. Acad. xi. 162; Engelm. in Gard. Chron. 1882, ii. 776, figs. 138–139.—Acaulescent. Leaves about 15 in a rosette, linear,  $1\frac{1}{2}$ –2 ft. long,  $1\frac{1}{2}$  in. broad low down, narrowed gradually to the non-pungent tip,

minutely serrulate. Peduncle 3-4 ft. long, with numerous subulate recurved bract-leaves 4-6 in. long; flowers in a dense spike about 2 ft. long. Flower about an inch long; tube very short; segments oblong,  $\frac{1}{3}$  in. long. Stamens 2 in. long. Capsule oblong,  $\frac{1}{2}$  in. long.

Hab. Northern Mexico, near Monterey. Introduced by Dr. Palmer to the Cambridge (Harvard) Botanic Garden, where it flowered in 1881. Habit of *A. yuccifolia*.

#### Group 11.—ATTENUATE.

116. *A. (Littaa) ELEMETIANA* Jacobi, Monogr. 178, 313; Baker in Saund. Ref. Bot. t. 163; Gard. Chron. 1876, ii. fig. 145.—Acaulescent. Leaves 20-25 in a rosette, oblanceolate-oblong,  $1\frac{1}{2}$ -2 ft. long,  $4\frac{1}{2}$ -6 in. broad above the middle, narrowed to 3-4 in. above the base, slightly glaucous, the face flat above the middle, the tip not at all pungent, the margin pale and quite entire. Peduncle, including the dense 3-4 ft. spike, 12-13 ft. long. Flowers  $1\frac{1}{4}$ - $1\frac{1}{2}$  ft. long; tube scarcely any; segments greenish yellow, oblong,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Stamens 2 in. long.

Hab. Mexico, introduced about 1864 and named by Jacobi after his friend M. de Jonge Van Elemeet, whose fine collection was dispersed in 1873. It was first flowered by Mr. Wilson Saunders at Reigate in 1867. It flowered at Kew in 1877 and 1883.

117. *A. (Littaa) ATTENUATA* Salmdyck, Hort. Dyck. 303; Rev. Hort. 1875, 149, figs. 31-32. *A. glaucescens* Hook. in Bot. Mag. t. 5333; Gard. Chron. 1887 ii. 219, fig. 55. *A. spectabilis* Hort. Trunk reaching a length of 4-5 ft. below the rosette of leaves. Leaves 10-20 in a dense spreading rosette, oblong, 2-2 $\frac{1}{2}$  ft. long, 8-9 in. broad above the middle, narrowed to 2 $\frac{1}{2}$ -3 in. above the base, persistently glaucous, the face flat, the tip not at all pungent, the edge pale and quite entire. Peduncle twice as long as the leaves; bract-leaves adpressed, lanceolate. Spike dense, cernuous, 6-8 ft. long. Flower 2 in. long; segments greenish-yellow, oblong, longer than the funnel-shaped tube. Stamens under 2 in. long.

Hab. Mexico, introduced into cultivation about 1834. It has flowered several times at Kew, beginning with 1861, and was figured lately in the 'Gardener's Chronicle' from a plant that bloomed with Dr. Henriques at Coimbra.

#### Group 12.—VIVIPARÆ.

118. *A. PUGIONIFORMIS* Zuccar. in Nova Acta xvi. 2, 676.—Acaulescent. Leaves linear,  $1\frac{1}{2}$ -2 ft. long, 6-8 lines broad, glaucescent, narrowed gradually to a firm dark brown end-spine  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, slightly concave on the face, the teeth small, distant, deltoid-cuspidate, dark brown, straight or unciniate. Inflorescence unknown.

Hab. Mexico, introduced about 1830. I have never seen this species.

119. *A. SERRULATA* Karw. in Otto Gartenzeit. 1842, 51.—Acaulescent. Leaves ensiform, 2-2 $\frac{1}{4}$  ft. long, an inch broad at the middle, narrowed to  $\frac{3}{4}$  in. above the base, glaucescent, the face

slightly concave, the end-spine very small, black, the small teeth crowded in the lower part of the margin, at first greenish, finally brown. Inflorescence unknown.

Hab. Mexico. Introduced into cultivation about 1842. This species also I have never seen.

120. *A. (Euagave) VIVIPARA* Linn. Sp. Plant. 461 (Rumph. Amboin. v. 273, tab. 94); Wight, Ic. t. 2024, non Salmdyck. *A. Cantula* Roxb. *A. Rumphii* Hassk. *Fourcroya Cantula* Haw.—Shortly caulescent. Leaves 20–50 in a dense rosette, ensiform, 2–3 ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, narrowed to 1– $1\frac{1}{4}$  in. above the base, dull green when mature, glaucous in an early stage, thin but firm in texture, the subpungent brown end-spine  $\frac{1}{2}$  in. long, the deltoid subdistant brown hooked teeth  $\frac{1}{2}$ –1 line long. Inflorescence reaching a length of 12–20 ft.; thyrsoid panicle much shorter than the peduncle. Flowers  $1\frac{1}{2}$ –2 in. long, often turned into bulbillæ like those of *Furcraa*; tube very short; segments greenish yellow,  $\frac{3}{4}$ –1 in. long. Filaments twice as long as the segments.

Hab. Mexico and Honduras. Introduced early and now spread widely in the Old World. It is common in India, and we have it also from Fernando Po. It has been twice flowered lately by Mr. Thos. Hanbury at Mortola. It is fully described by Jacobi under the name of *A. Cantula* Galeotti, in his first Nachtrage, p. 45–47. I cannot from the descriptions separate *A. bulbifera* Salmdyck and *A. stenophylla* Jacobi.

121. *A. RUBESCENS* Salmdyck, Hort. 1834, 306. *A. flaccida* Haworth?—Acaulescent. Leaves lanceolate, 2 ft. long,  $1\frac{1}{2}$  in. broad, glaucescent, turning reddish in bright sunlight or when fading, subflaccidly recurved, the upper part deeply channelled, the end-spine slender and brownish, the minute crowded deltoid teeth whitish with a pale brown tip. Inflorescence unknown.

Hab. Mexico. Described by Prince Salmdyck from his own collection in 1834.

122. *A. LAXA* Zuccar. in Salmdyck, Hort. 1834, 8; Baker in Gard. Chron. 1877, ii. fig. 151.—Shortly caulescent. Leaves 50–60 in a rosette, ensiform, 2– $2\frac{1}{4}$  ft. long,  $1\frac{1}{2}$ –2 in. broad at the middle, narrowed to an inch above the base, and very gradually from the middle to the small dark brown subpungent tip, bright green, slightly glaucous towards the base in an early stage, the distant hooked brown marginal prickles about a line long. Inflorescence unknown.

Hab. Mexico. First described by Prince Salmdyck from his own collection in 1834. It may be a variety of *A. vivipara*.

123. *A. BROMELIÆFOLIA* Salmdyck, Hort. 1834, 303. *A. teoxamuliana* Karw.—Acaulescent. Leaves ensiform, resembling those of *Karatus Pinguin*, 2– $2\frac{1}{2}$  ft. long, 2– $2\frac{1}{2}$  in. broad at the middle, narrowed to an inch above the base, rather shining green, the end-spine weak, the moderately crowded deltoid hooked red-brown teeth 1–12th to 1–8th in. long. Inflorescence unknown.

Hab. Mexico. Introduced into cultivation by Karwinski about 1834.

124. *A. (Euagave) SOBOLIFERA* Salmdyck, Hort. 1834, 307 (Herm. Lugd. 16–17, with figure). *A. antillarum* Desc.—Shortly caulescent. Leaves 20–40 in a rosette, oblong, 2–3 ft. long,

3-5 in. broad at the middle, narrowed to 2-3 in. above the base, very bright green, the face deeply concave, the subpungent brown end-spine  $\frac{1}{2}$  in. long, the distant brown deltoid-uncinate marginal prickles 1-12th to 1-8th in. long. Peduncle 8-10 ft. long; inflorescence a deltoid panicle, the lower branches 9-12 in. long. Flowers 2-2 $\frac{1}{2}$  in. long; tube  $\frac{1}{4}$  in. long; segments linear-oblong, bright yellow,  $\frac{3}{4}$ -1 in. long. Stamens less than twice as long as the segments. Capsule oblong, 1 $\frac{1}{2}$ -1 $\frac{3}{4}$  in. long.

Hab. West Indies. First noticed as a cultivated plant by Hermann in 1678. My description is taken from living plants at Kew and Reigate, and of the inflorescence from Dr. Engelmann, whose notes were made on plants collected by Dr. Parry and Mr. C. Wright on San Domingo. It resembles *Eurcreea cubensis* in leaf and habit. It is often called *A. viripara* in English gardens, and is figured under that name in Gard. Chron. 1877, ii. fig. 150.

125. *A. TODAROI* Baker.—Acaulescent. Leaves oblong, 6-7 ft. long, 18 in. broad at the middle, narrowed to 9 in. above the base, bright green, much undulated, the face very concave, the end-spine scarcely pungent, the edge much undulated between the very large deltoid hooked brown marginal prickles. Inflorescence unknown.

Hab. Probably Mexico. Described from a leaf and photograph sent by Dr. Todaro in January, 1886. It has been cultivated in the Palermo Botanic Gardens under the name of *A. undulata*. It is a magnificent plant, with the leaves like those of *A. sobolifera* in colour and texture, but with the undulated edge and large teeth of *A. Scolymus* and *potatorum*.

#### Group 13. YUCCÆFOLIÆ.

126. *A. (Littea) YUCCÆFOLIA* DC. in Red. Lil. t. 328-329; Hook. in Bot. Mag. t. 5213. *A. Colniana* Jacobi. — Shortly caulescent. Leaves 20-40 in a dense rosette, linear, much recurved, 1 $\frac{1}{2}$ -2 $\frac{1}{2}$  ft. long,  $\frac{3}{4}$ -1 in. broad at the middle, dilated to 1 $\frac{1}{2}$  in. at the base, deeply channelled all down the face, a dull rather glaucous green, with a pale band down the centre, the tip not at all pungent, the back broadly rounded, the edge with a narrow brown scarioso line, entire or obscurely serrulate. Peduncle 6-8 ft. long, including the short lax spike. Flower 1 $\frac{1}{2}$  in. long; tube  $\frac{1}{4}$  in. long; segments linear-oblong, greenish yellow,  $\frac{5}{8}$ - $\frac{3}{4}$  in. long. Stamens twice as long as the segments.

Hab. Mexico. Introduced into cultivation about the beginning of the century. It flowered at Kew in 1829, from a plant brought by Richard Cunningham from Paris, and again in 1861 and 1874, and with Mr. Thomas Hanbury at Mortola in 1887. The flowers are sometimes single and sometimes in pairs, so it connects the subgenera *Littea* and *Manfreda*.

127. *A. (Littea) SPICATA* Cav. Descr. 454, non DC.—Leaves spreading, ensiform, above 2 ft. long, nearly 3 in. broad at the base where it is widest, channelled down the face, serrulate on the margin. Peduncle 15 ft. long, including the 6 ft. spike. Perianth greenish yellow; tube short; segments linear-oblong. Stamens twice as long as the segments.

Hab. Described by Cavanilles in 1802, from a plant that flowered in the Madrid Botanic Garden, brought from Havana. No other botanist seems to have seen it.

## Group 14. HERBACEÆ.

127. A. (*Manfreda*) MACULATA Regel, Ind. Sem. Hort. Petrop. 1856, 16. *A. maculosa* Hook. in Bot. Mag. t. 5122; Fenzi in Gard. Chron. 1872, 1194, fig. 273.—Acaulescent. Leaves 12–20 in a rosette, lanceolate, spreading,  $\frac{1}{2}$ –1 ft. long,  $\frac{3}{4}$ –1 in. broad at the middle, glaucous green, mottled on both sides with irregularly brownish blotches, the point not at all pungent, the edge distinctly rather distantly serrulate. Peduncle  $1\frac{1}{2}$ –3 ft. long; bract-leaves few and much reduced. Flowers in a lax subspicate raceme  $\frac{1}{2}$ –1 ft. long; lower pedicels finally  $\frac{1}{8}$  in. long. Perianth  $1\frac{1}{2}$  in. long; tube subcylindrical, curved,  $\frac{3}{4}$  in. long; segments linear-oblong, purplish green, not longer than the tube. Stamens scarcely longer than the segments. Capsule  $\frac{3}{4}$ –1 in. long.

Hab. Texas and the north of Mexico, *C. Wright* 483! 1905! *Palmer* 1306! 1307!

128. A. (*Manfreda*) SESSIFLORA Hemsl. Bot. Cent. Amer. iii. 350, tab. 88B.—Acaulescent. Rootstock  $2\frac{1}{2}$  in. diam. Leaves linear or ensiform, 1– $1\frac{1}{2}$  ft. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad at the middle, tapering gradually to a long point, closely serrulate on the margin. Peduncle 2 ft. or more long. Spike short, lax. Flowers  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long; tube narrowly funnel-shaped, as long as the linear-oblong brownish segments. Stamens much exerted.

Hab. Mountains of Central Mexico, *Bourgeau* 412! 3003!

129. A. (*Manfreda*) REVOLUTA Klotzsch in Otto & Dietr. Gartenzeit. 1870, 274.—Acaulescent. Leaves a dozen or more, lanceolate, 6–8 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad low down, plain green; pruinose beneath, falcate, channelled down the face, entire on the margin. Peduncle 4 ft. long, including the dense spike. Perianth  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long; tube equalling in length the greenish linear-oblong segments. Stamens exerted.

Hab. Mexico. Introduced to the Berlin Botanic Garden in 1840.

130. A. (*Manfreda*) VARIEGATA Jacobi, Monogr. 180; Baker in Saund. Ref. Bot. t. 326.—Acaulescent. Leaves 15–18 in a rosette, spreading, lanceolate, 12–15 in. long, 1–2 in. broad, deeply channelled down the face, copiously spotted with brown, a green ground, the narrow cartilaginous edge very obscurely serrulate. Peduncle 3 ft. long, including the 12–15-flowered lax spike. Flowers  $1\frac{1}{4}$ – $1\frac{1}{2}$  in. long; tube subcylindrical, equalling the linear-oblong greenish-brown segments. Stamens much exerted. Capsule oblong, under an inch long.

Hab. Northern Mexico; valley of the Rio Grande. Discovered by Dr. Gregg in 1847. Described from a plant that flowered with Mr. Wilson Saunders in 1870.

131. A. (*Manfreda*) ALIBERTII Baker in Gard. Chron. 1883, i. 176. *Allibertia intermedia* Marion.—Rootstock sheathed by several fleshy scale-leaves. Leaves 10–12 in a rosette, lanceolate, 12–16 in. long, narrowed gradually from a little above the base to an acute channelled tip, serrulate on the margin. Peduncle including the inflorescence 4–5 ft. long. Flowers subspicate; pedicels very short.

Perianth a little over an inch long; tube subcylindrical; segments very short. Stamens exerted above an inch.

Hab. Probably Mexico. Figured and described by M. Marion in the 'Revue Horticole des Bouches du Rhone,' Sept. and Nov., 1882. We received a living plant in 1884 from M. Deleuil labelled *Alliberthiera intermedia*.

132. *A. (Manfreda) PUBESCENS* Regel & Ortgies in Gartenfl. 1874, 227, tab. 804.—Leaves 12–15 in a rosette, spreading, lanceolate, 9–12 in. long, 1–1½ in. broad, papillose and minutely pubescent all over both surfaces, dull green spotted with purple towards the base, not serrulate. Peduncle 3 ft. long. Spike ½ ft. long, laxly 12–15-flowered. Perianth 1¼ in. long; tube subcylindrical, longer than the linear-oblong greenish segments, which are ¼–⅓ in. long. Stamens much exerted.

Hab. Mexico. Introduced by Roezl about 1870. Seen at Mr. J. T. Peacock's, December, 1877, but not in flower.

133. *A. (Manfreda) VIRGINICA* Linn. Sp. Plant. 416; Jacq. Ic. t. 378; Bot. Mag, t. 1157, non Miller.—Acaulescent. Leaves 10–15 in a rosette, spreading, lanceolate, ½–1½ ft. long, 1–3 in. broad at the middle, plain green or mottled with brown spots, the narrow white edge very obscurely serrulate. Peduncle 2–3 ft. long. Flowers brownish green, arranged in a lax raceme 1–1½ ft. long; lower pedicels ¼–⅓ in. long. Perianth 1–1¼ in. long; tube subcylindrical, ½ in. long; segments linear oblong, ⅓–½ in. long. Stamens 2–3 times the length of the segments. Capsule ¼–⅓ in. long.

Hab. Southern United States.

134. *A. (Manfreda) BRACHYSTACHYS* Cav. Descr. 453. *A. spicata* DC. in Red. Lil. t. 485, non Cav. *A. polyanthoides* Cham. et Schlecht. *A. saponaria* Lindl. in Bot. Reg. xxv. t. 55. *A. humilis* Roem.—Acaulescent. Leaves 12–15 in a rosette, spreading, lanceolate 1–1½ ft. long, 1–1½ in. broad at the middle, glabrous, plain green, the pale edge very indistinctly serrulate. Peduncle 3–4 ft. long; bract-leaves distant, small. Spike lax, 1 ft. or more long. Flowers 2 in. long; tube subcylindrical, ¾–1 in. long; segments linear, greenish yellow, ½ in. long. Stamens twice as long as the segments. Capsule ¾ in. long.

Hab. Mexico. Introduced into cultivation at the beginning of the century. Coulter 1555! Andrieux 61! We had it alive in 1877, from the Rev. H. N. Ellacombe. The native name is *Mole*, and the root is used as soap.

135. *A. (Manfreda) PLANIFOLIA* S. Wats. Contrib. xiv. 479.—Rootstock persistent for three or four years. Leaves lanceolate, flat or nearly so, 8–12 in. long, 1–2¼ in. broad at the middle, not spotted, minutely denticulate. Peduncle 4–5 ft. long. Perianth ¾ in. long exclusive of the ovary; segments 3–4 times the length of the tube. Stamens much exerted.

Hab. Mexico; province of Chihuahua, gathered by Mr. C. G. Pringle in 1886.

136. *A. (Manfreda) PROTUBERANS* Engelm. inedit. *A. guttata* Hemsl. Biol. Cent. Amer. Bot. iii. t. 87—Acaulescent. Leaves 8–12 in a rosette, spreading, lanceolate, above a foot long when

mature,  $1-1\frac{1}{4}$  in. broad at the middle, narrowed to  $\frac{1}{2}$  in. above the base, shallowly channelled down the face, dull green copiously mottled with confluent brown spots, closely denticulate on the cartilaginous margin. Peduncle 3-4 ft. long. Flowers laxly or densely spicate. Perianth  $1-1\frac{1}{4}$  in. long; tube  $\frac{1}{6}-\frac{1}{4}$  in. long, broadly funnel-shaped; segments linear-oblong, 2-3 times the length of the tube. Filaments twice as long as the segments. Capsule oblong, under an inch long.

Hab. Mexico; Mountains of San Luis Potosi, alt. 6000-8000 ft., *Schaffner* 505! 506! *Parry & Palmer* 865! Described partly from living plants at Kew, received from Max Leichtlin.

137. A. (*Manfreda*) GUTTATA Jacobi and Bouché, Monogr. 190; Nacht. ii. 87.—Acaulescent. Leaves few, lanceolate, spreading, 15-16 in. long, 2 in. broad below the middle, deeply channelled down the green face, paler beneath with subpruinose streaks, with reddish-brown blotches on both surfaces, subentire on the edge. Flowers  $1\frac{1}{2}$  in. long; segments linear-oblong, twice as long as the short funnel-shaped tube. Stamens 2 in. long.

Hab. Mexico. Introduced to the Berlin Botanic Garden about 1860, by Ehrenberg, and flowered there in 1870.

138. A. (*Manfreda*) UNDULATA Klotzsch in Otto & Dietr. Gartenzeit, 1840, 274. *A. drimifolia* Hort.—Acaulescent. Leaves a dozen or more in a rosette, lanceolate,  $1\frac{1}{2}$  ft. long,  $1\frac{1}{4}$  in. broad, deeply channelled down the face, dull glaucous green, not spotted, much undulated, the narrow cartilaginous edge obscurely serrulate. Peduncle 3-4 ft. long. Flowers above  $1\frac{1}{2}$  in. long; segments twice as long as the tube. Stamens much exerted.

Hab. Mexico. Introduced to the Berlin Garden in 1840 and flowered there in 1869.

### 61. FURCRÆA Vent.\*

(*Fourcroya* R. & S.).

*Perianth* rotate; tube short, cylindrical; segments oblong, subequal, spreading horizontally. *Stamens* short, attached to the throat of the perianth-tube; filaments erect, very strumose in the lower half; anthers oblong, versatile. *Ovary* oblong, 3-celled; ovules many, superposed; style erect, strumose, with three prominent angles towards the base; stigma capitate. *Capsule* oblong, loculicidally 3-valved. *Seeds* flat, with a thin black testa.—Acaulescent or caulescent. *Leaves* densely rosulate, usually rigid, spine-pointed and spine-edged. *Flowers* laxly panicled, greenish white, 1-3-nate, often replaced by bulbillæ, from which the plant can be readily reproduced; pedicels articulated; bracts small, membranous.

Subgenus FURCRÆA PROPER.—Leaves firm in texture, usually edged with deltoid spines, entire between them.

Group of *gigantea*.—Trunk long below the  
rosette of leaves . . . . . Sp. 1.

\* Reprinted, with slight alteration, from Gard. Chron. 1879, i. 623, 656.

Group of *cubensis*.—Trunk none or short.

Inner leaves rigidly suberect; marginal prickles larger . . . . . Sp. 2-10.

Inner leaves thinner and more or less wavy; marginal prickles smaller . . . . . Sp. 11-15.

Subgenus ROEZLIA. — Leaves more flexible, closely, minutely denticulate, not spiny on the edge. Trunk produced . . . . . Sp. 16-17.

1. *F. GIGANTEA* Vent. in Ust. Ann. xix. 54; Bot. Mag. t. 2250; DC. Pl. Grasses, t. 126; Wight, Ic. t. 2025. *Agave fatida* Linn. (Commel. Hort. ii. t. 18). *F. fatida* Haw. *Funium pitiferum* Willemet.—Trunk reaching a length of 3-4 ft. Leaves 40-50 in a dense rosette, ensiform, 4-6 ft. long, 4-6 in. broad at the middle, narrowed to 2½-3 in. above the base, rigid, but the outer recurving, bright green, channelled down to the face, narrowed gradually to a pungent tip, usually without marginal spines, rarely (var. *Willemetiana* Roem.) with a few near the base. Peduncle, including inflorescence, 20-40 ft. long. Panicle about as long as the peduncle; central branches copiously compound; pedicels ¼-½ in. long, lower 2-3-nate. Ovary ¾ in. long, glabrous; segments greenish white, oblong, an inch long. Scent of flowers strong.

Hab. Widely spread in Tropical America and naturalised in Mauritius, Madagascar, and India. Introduced, into cultivation at Hampton Court in 1690. The leaves yield an abundant supply of excellent fibre (See Morris in Kew Bulletin, iii. 8). We have a specimen in flower from Kew Gardens, dried by Dr. Goodenough in November, 1793. I cannot separate definitely *F. atroviridis* Jacobi and Goepfert, Monogr. 273; Nachtrage, ii. 90.

2. *F. CUBENSIS* Haw. Syn. 73. *Agave cubensis* Jacq. *A. odorata* Pers.—Trunk very short below the rosette of leaves, 3-4 in. thick. Leaves about 30 in a rosette, lanceolate, bright green, firm in texture, shallowly channelled down the face, 2-2½ ft. long, 3-4 in. broad above the middle, narrowed to 1½ in. above the base, generally scabrous on the back, scarcely pungent at the convolute brown tip, margined with large distant deltoid hooked brown prickles. Peduncle 5-6 ft. long, with several ascending lanceolate bract-leaves. Panicle lax, rhomboid, 5-6 ft. long, 1½-2 ft. diam.; lower branches slightly compound; pedicels short, articulated at the tip, lower 2-3-nate. Ovary with short tube ¾ in. long; segments oblanceolate-oblong, an inch long, milk-white, green outside, Scent faint.

Hab. Widely spread in Tropical America, and often cultivated in the Old World. Described from a plant that flowered at Kew, November, 1877. Var. *inermis* Baker, in Bot. Mag. t. 6573, is a form with the leaves entirely destitute of spines, from the collection of Mr. Wilson Saunders, that flowered at Kew in November, 1879. I cannot separate definitely *F. Aitoni* and *vulveculata* Jacobi, Nacht. 59-60. *F. Lindeni* Jacobi in Ill. Hort. n. s., t. 186, differs mainly by its handsomely variegated leaves. For an elaborate account of its pre-Linnean synonymy see Martius in Fl. Bras. iii. 188.

3. *F. TUBEROSA* "Ait.;" Jacobi, Monogr. 276; Hassk. Retz. ii. 16. *Agave tuberosa* "Miller"; Salmdyck, Hort. Dyck. 302.—Trunk

6-8 in. long below the rosette of leaves, 2-3 in. diam. Leaves about 30 in a rosette, lanceolate, bright green, firm in texture, 2-3 ft. long, 2-3 in. broad at the middle, smooth on the face, scabrous on the back, scarcely pungent at the tip, armed on the margin with remote horny uncinatè prickles. Panicle with peduncle (according to Hasskarl) reaching a height of 30 ft. or more; branches copiously compound, the central ones 6-9 long. Flowers greenish white, sweet-scented; segments oblong, an inch long.

Hab. Tropical America. The descriptions of Miller and Aiton are very brief. In the absence of reliable specimens I have simply copied Jacobi and Hasskarl. See also Carriere in Rev. Hort. 1877, 234, figs. 39-40. We have a photograph from Prof. Miquel's collection, of a young plant of *F. interrupta* Hort. Van Houtte, which, according to Jacobi, is the genuine *tuberosa*. All the species of the *cubensis* group seem to come very near to one another, and I much doubt their being all really distinct specifically.

4. *F. GEMINISPINA* Jacobi, Monogr. 282.—Trunk reaching a foot long, 5-6 in. diam. below the rosette of leaves. Leaves 40-50 in a dense rosette, lanceolate, 3-4 ft. long, 6-8 in. broad at the middle, narrowed to  $3\frac{1}{2}$ -4 in. above the base, bright green, smooth on the shallowly channelled face, very scabrous on the back, the short brown point subpungent, the edge armed with distant deltoïd-uncinatè brown spines  $\frac{1}{8}$  in. long, many, especially about the middle of the leaf, confluent, so as to have a hook pointing both ways. Inflorescence unknown.

Hab. Tropical America. Described from a fine plant which has been in the Cactus House at Kew for many years, but has never flowered. Probably this is the plant placed as a variety of *tuberosa* by Willdenow and Aiton.

5. *F. SELLOA* K. Koch; Jacobi, Monogr. 289; Hook. fil. in Bot. Mag. t. 6148.—Trunk none or very short, 4-5 in. thick. Leaves 30-40 in a dense rosette, lanceolate, very rigid in texture, bright green, 3-4 ft. long, 4 in. broad at the middle, narrowed to  $1\frac{1}{2}$ -2 in. above the base, subpungent at the tip, the margin armed with distant hooked large brown horny prickles. Peduncle 8-10 ft. long below the panicle; bract-leaves distant, lanceolate, 3-4 in. long. Panicle 5-6 ft. long, 3 ft. broad; branches simple; lower flowers 2-3 nate; pedicels  $\frac{1}{2}$  in. long. Ovary including the short tube an inch long; segments oblong-lanceolate,  $1\frac{1}{2}$ - $1\frac{3}{4}$  in. long,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad, much tinged with green. Scent faint.

Hab. Mexico and Guatemala. Introduced into cultivation by Warcewicz. Described from a plant that flowered at Kew, November, 1877.

6. *F. COMMELYNI* Kunth, Enum. v. 842. *Agave Commelyni* Salmdyck, Hort. 301 (Commel. Hort. Amstel. ii. t. 19). Sub-acaulescent. Leaves about 30 in a rosette, lanceolate, bright green,  $2\frac{1}{2}$  ft. long,  $3\frac{1}{2}$ -4 in. broad at the middle, narrowed to  $1\frac{1}{2}$  in. above the base, coriaceous in texture, bright green and very glossy on the face, the point scarcely pungent, the edge smooth except a few obscure spines near the base. Panicle with peduncle 25 ft. long, the former rhomboid, 11-12 ft. long, 14 ft. diam. Perianth-segments an inch long.

Hab. Tropical America. Described from plants at Kew and in the Saunders collection.

7. *F. STRICTA* Jacobi, Nacht. 56.—Acaulescent. Leaves about 30 in a rosette, lanceolate, bright green, not so firm in texture as in *F. cubensis*, 2–2½ ft. long, 2–2½ in. broad at the middle, narrowed to 1½ in. near the base, smooth on the face, scabrous on the back, subacutely keeled, so deeply channelled as to be almost triquetrous in section above the middle, margined with distant large deltoid uncinatè prickles. Peduncle with panicle 8–9 ft. long. Perianth-segments an inch long.

Hab. Tropical America. First described by Jacobi from a plant that flowered with M. Demoulin, at Mons, in 1868. We received it lately at Kew, from the Berlin Botanic Garden.

8. *F. FLAVOVIRIDIS* Hook. in Bot. Mag. t. 5163. —Acaulescent. Leaves 20–30, lanceolate, 2–2½ ft. long, 3–4 in. broad at the middle, narrowed to 1½ in. above the base, bright green, similar to those of *cubensis* in texture, smooth on the face, scabrous on the back, margined with middle-sized horny deltoid hooked prickles. Peduncle with the panicle 12–15 ft. long, the latter shorter than the barren portion. Expanded flower 3 in. diam.; ovary glabrous, an inch long. Segments greenish white, oblong-lanceolate, ½–⅝ in. broad.

Hab. Mexico. Sent from Real del Monte by Mr. Repper to Kew, where it flowered for the first time in 1859. Described from a plant that flowered at Kew, November, 1887.

9. *F. PUBESCENS* Todaro, Sopra Nuov. sp. Fourc. 1879. —Acaulescent. Leaves about 30, lanceolate, rigid in texture, not at all wavy, 2 ft. long, 2½ in. broad at the middle, pungent at the tip and armed with distant deltoid-uncinatè middle-sized prickles. Peduncle rather longer than the leaves. Panicle five times as long as the peduncle; branches ascending, arcuate, copiously compound. Ovary densely pubescent. Perianth-segments greenish white, above an inch long, ½–¾ in. broad.

Hab. Tropical America. Described from drawings sent by Prof. Todaro.

10. *F. ELEGANS* Todaro, Hort. Panorm. 13, t. 4. *F. Gheisbreghtii* and *pugioniformis* Hort.—Trunk none or very short below the rosette of leaves. Leaves 40–50 in a rosette, lanceolate, 5–6 ft. long, 4–5 in. broad at the middle, narrowed to 3 in. above the base, bright green, smooth on the face, scabrous on the back, with a short brown end-spine and large brown horny marginal prickles. Peduncle 20–25 ft. long, paniced nearly down to the base; inflorescence 9 ft. diam.; branches copiously compound, the lower as long as the central ones. Ovary with short tube an inch long; segments greenish white, 1½ in. long, ½–¾ in. broad.

Hab. Mexico. Described and figured by Professor Todaro, from a plant that flowered in the Palermo Botanic Garden in 1875.

11. *F. UNDULATA* Jacobi, Nacht. 55; Hook. fil. in Bot. Mag. t. 6160.—Acaulescent. Leaves 20–30 in a rosette, lanceolate, 1½ ft. long, 1½–2 in. broad at the middle, narrowed to ¾–1 in. above the base, dull green, wavy, all recurving, deeply channelled down the face, scabrous on the back, almost pungent at the tip, armed on the edge with hooked deltoid brown prickles 1–12th in. long. Peduncle 3 ft.

long. Panicle 7-8 ft. long; branches short, erecto-patent, simple, cernuous. Ovary glabrous,  $\frac{3}{4}$ -1 in. long. Perianth-segments greenish white,  $1\frac{1}{4}$  in. long.

Hab. Mexico; Chiapas and Tabasco. Sent by Gheisbreght to Verschaffelt. It was described by Jacobi in 1867, and first flowered at Kew in October, 1874. A fine drawing sent by Dr. Fenzl to Kew in 1863, under the name of *F. tuberosa*, apparently represents this species. We have a similar plant with smaller very thin leaves, received from Bermuda by Mr. Wm. Bull in 1878. *F. Roezlii atropurpurea*, exhibited by De Smet at Brussels in 1876, is said to have thin leaves a foot long, of a pale bronzy purplish tint.

12. *F. BARILLETI* Jacobi, Nacht. 51.—Trunk  $\frac{1}{2}$  ft. long, 2-3 in. diam. below the rosette of leaves. Leaves many in a rosette, lanceolate,  $2\frac{1}{2}$ -3 ft. long, 4-5 in. broad at the middle, narrowed to 2 in. above the base, a subopaque deep green with streaks of darker green, wavy and subangulate concave down the face, not pungent at the point, the margin with only a few minute deltoid teeth similar to the blade in substance. Inflorescence unknown.

Hab. Tropical America. Described by Jacobi from specimens in the Parc Monceau at Paris, in 1867.

13. *F. DEMOULINIANA* Jacobi, Monogr. 297. — Acaulescent. Leaves numerous, lanceolate, 2 ft. long,  $2\frac{1}{4}$  in. broad at the middle, narrowed to an inch above the base, firm in texture, opaque green, very convex on the back, the apex not pungent, the margin armed only with a few minute deltoid brown teeth. Peduncle 9-10 ft. long, including the panicle, which begins 3 ft. from its base. Flowers unknown.

Hab. Mexico. Introduced by Galeotti to the Botanic Garden at Brussels. Described in 1866.

14. *F. LIPSIENSIS* Jacobi, Nacht. 54.—Acaulescent. Leaves 20-30 in a rosette, lanceolate, 2- $2\frac{1}{2}$  ft. long, 3 in. broad at the middle, narrowed to 1 in. above the base, moderately firm in texture, all recurved, an intense opaque light green, with pruinose streaks on the upper side when young, the end-spine short, the minute deltoid teeth horny at the tip. Peduncle 3 ft. long. Panicle 9 ft. long. Perianth-segments oblong-lanceolate,  $1\frac{1}{4}$  in. long,  $\frac{1}{3}$ - $\frac{1}{2}$  in. broad.

Hab. Tropical America. Described by Jacobi in 1863, from plants received from the Leipsic Botanic Garden.

15. *F. DEPAUPERATA* Jacobi, Monogr. 293.—Acaulescent. Leaves few, lanceolate, about 1- $1\frac{1}{2}$  ft. long,  $1\frac{1}{2}$ -2 in. broad at the middle, narrowed to half-an-inch above the base, very thin, bright green, the tip not pungent, the minute teeth deltoid and patent, scarcely at all horny. Peduncle 3 ft. long, the lowest branch of the panicle arising half-a-foot from its base. Flowers all solitary. Perianth-segments oblong-lanceolate, above an inch long,  $\frac{1}{3}$ - $\frac{1}{2}$  in. broad.

Hab. Tropical America. Described by Jacobi from a plant received in 1865 from M. Bedinghaus, of Mons. We received a plant at Kew in 1882, from the Botanic Garden of Berlin.

## Subgenus ROEZLIA.

16. *F. BEDINGHAUSII* K. Koch, *Wochen.* 1863, 233; Belg. Hort. 1863, 327, with fig. *Yucca Parmentieri* Roezl. *Roezlia bulbifera*, *R. regia*, *Yucca argyrophylla*, and *Y. Toneliana* Hort. *F. Roezlii* André in *Rev. Hort.* 1887, 353, fig. 71.—Trunk 5–6 ft. long below the rosette of leaves, 6–9 in. diam. Leaves 50 or more in a dense rosette, ensiform, 3–4 ft. long, 3–4 in. broad at the middle, narrowed gradually to the point and to an inch above the base, permanently glaucous on both sides, smooth on the face, very scabrous on the back, the margin minutely denticulate, as in *Beschorneria*. Inflorescence reaching a height of 15–20 ft.; peduncle much shorter than the pyramidal panicle, the branches of which are long and drooping; lower flowers 2–3-nate; pedicels  $\frac{1}{4}$ – $\frac{1}{3}$  in., articulated at the tip. Ovary pubescent, an inch long; perianth-segments oblong, an inch long, tinged green outside.

Hab. Mexico. Introduced by Roezl about 1860. (For a full account of its discovery see Belg. Hort. 1883, 133.) First flowered by M. Bedinghaus, of Mons, after whom it was named by Karl Koch in 1863, and lately (1875 and 1881) by Mr. Dorien Smith, in Scilly; by Mr. J. Spull, in 1887; and at the Jardin d'Acclimatation, Hyeres, in 1887.

17. *F. LONGEVA* Karw. et Zucc. in *Nova Acta*, xvi. 2, 606, t. 48; Hook. in *Bot. Mag.* t. 5519.—Trunk reaching a length of 40–50 ft., 1–1 $\frac{1}{2}$  ft. diam. Leaves 100 or more in a dense rosette, ensiform, 4–5 ft. long, 4–5 in. broad, narrowed gradually to the point and to 2 in. above the base, opaque green, not glaucous, nearly all recurving, the face flat in the centre, the back with only a scabrous keel, the edge minutely denticulate. Peduncle with panicle reaching a length of 40 ft.; branches spreading or drooping, copiously compound, reaching a length of 12–15 ft.; lower flowers 2–3-nate. Ovary very pubescent. Perianth-segments oblong, an inch long,  $\frac{1}{2}$  in. broad.

Hab. Mexico. Discovered by Karwinski about 1829, in the province of Oaxaca, alt. 10,000, and found also by Skinner in Guatemala. (See Bateman's *Monograph of Odontoglossum*, sub t. 17.) Was flowered at the Regent's Park Botanic Garden in 1864, and at the Wellington Botanic Garden, in New Zealand, in 1885. There is a very fine specimen planted out in the Temperate House at Kew.



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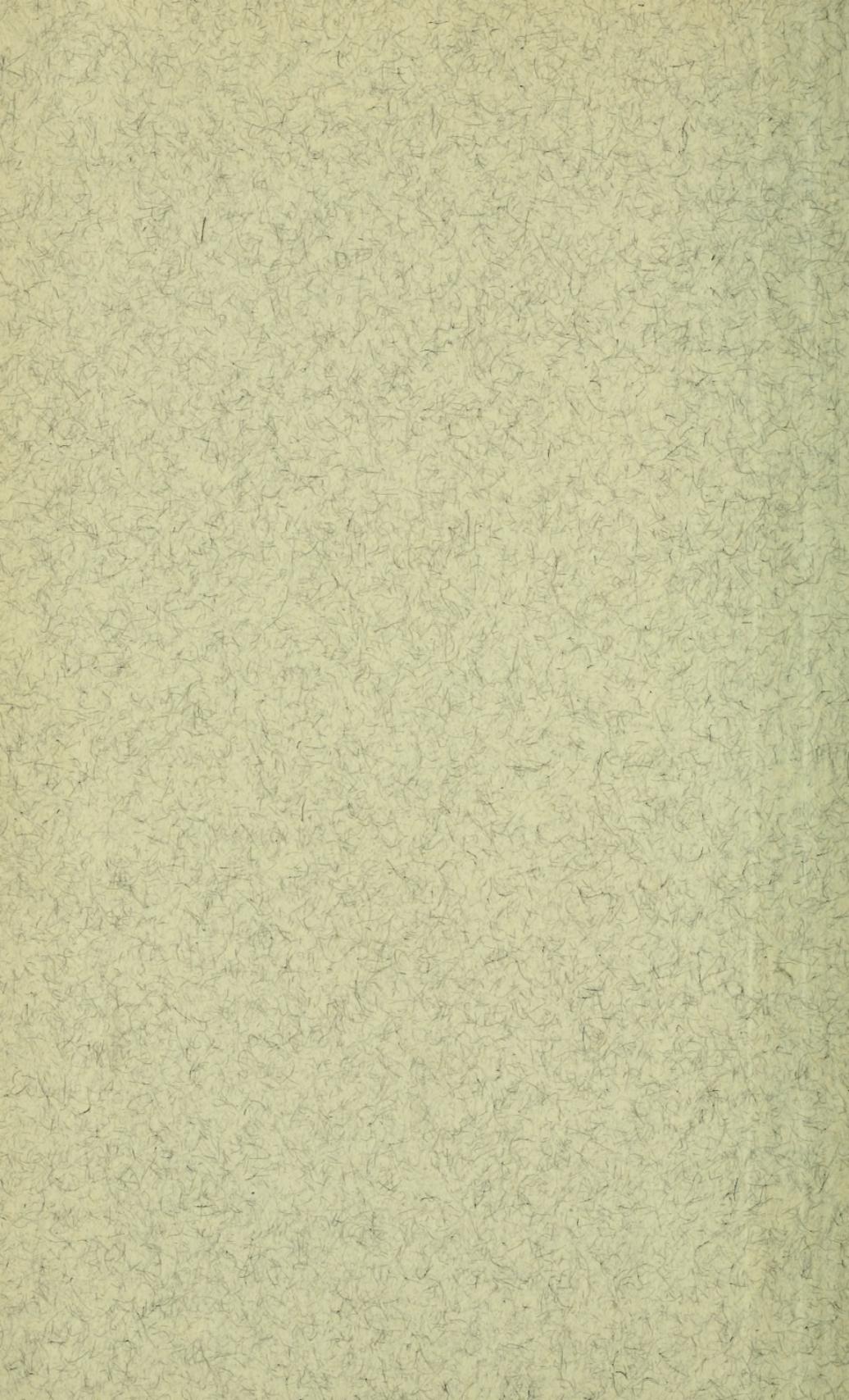
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