On a small Collection of dried Plants obtained by Sir Martin Conway in the Bolivian Andes. By W. BOTTING HEMSLEY, F.R.S., F.L.S., and H. H. W. PEARSON, M.A., F.L.S.

[Read 4th April, 1901.]

OUR knowledge of the plants of the Bolivian Andes is principally due to the labours of D'Orbigny, F. J. F. Meyen, Pentland, and more especially those of Weddell and Mandon. D'Orbigny in 1830 ascended the western slopes to Lake Titicaca, crossed the ridge, and descended on the Eastern side as far as Chiquitos. On his return he visited the Highlands of Cochabamba and brought plants from the vicinity of the snow-limit*. He was followed a year later by Meyen†. J. B. Pentland, a contemporary of D'Orbigny and Meyen, resided for some years in Bolivia as British Consul. He was particularly interested in the geology and meteorology of the Andes, and during his numerous journeys collected a few plants which are now at Kew. Some of these are from elevations exceeding 17,000 ft.

The foundation of Weddell's *Chloris Andina*, the classic contribution to our knowledge of the botany of the High Andes, was laid during his own journeys in the Bolivian Andes in 1845 and the two following years. Doctor and botanist to a French expedition under the leadership of Francis de Castelnau, Weddell landed at Rio de Janeiro in June 1843. In May 1845, the expedition was at Villa Maria on the confines of Paraguay. Here Weddell severed his connection with the Castelnau expedition and followed an independent route westward. He crossed the Andes and travelled in a north-westerly direction through Chuquisaca and Cochabamba to La Paz. He thoroughly explored the banks of Lake Titicaca, crossing the numerous affluent watercourses "dans de singulières embarcations composées de deux grosses bottes ou cylindres de Jones liés ensemble, et relevés en pointe aux extrémités."‡ This plant he states to be a *Scirpus* near *S. lacustris*, which was found in great abundance. Several minor journeys were made among the mountains from the Lake as a centre. In the course of these

* These are incorporated in the De Candolleian Herbarium.

† Reise um die Erde. Berlin, 1834-5, vol. i. Kap. 8; vol. ii. Kap. 9.

‡ Annales des Sciences Naturelles, Série 3, vol. xiii. p. 95.

journeys he crossed the ridge of the Cordilleras no less than five times. In November 1848 he embarked at Lima and returned to France with the most valuable contribution to the materials for the Flora of the High Andes which had ever been brought together. In 1851 Weddell set out again at the head of a commercial expedition whose object was to investigate the gold-producing possibilities of the soil of the Tipuani valley. The expedition lasted only a few months, but its leader found time to collect plants on Mount Sorata besides making valuable notes concerning the distribution of the species and taking a series of barometric observations*. Meanwhile another botanist, a friend of Weddell, commenced a very valuable collection of plants on the Bolivian Andes in the neighbourhood of Sorata. This was Gilbert Maudon, of French peasant parentage, who went to Bolivia in an industrial capacity in 1848. For six years he studied the flora of this region of the Andes and sent his extensive collections to Weddell, who was then engaged in writing the *Chloris Andina*†, which was commenced in 1852. The original idea of this work was to include the names, descriptions, and distribution, not of Weddell's plants only but also of the alpine species collected by Humboldt in Columbia, Ecuador, and Northern Peru; by Haencke, Meyen, D'Orbigny, Pentland and C. Gay in Bolivia; and by Gay in Chili‡. Of this work, so magnificently conceived, only two volumes were published. The first is devoted entirely to the Compositæ, members of which constitute a large proportion of the high-level floras of the world. The second, in which forty-one other natural orders are dealt with, was published in 1857. At this point other interests, family difficulties and ill-health supervened, and the work progressed no farther.

The latest collection of plants from the Bolivian Andes—that obtained by Sir Martin Conway in his expedition in 1898-9—is the subject of the present paper. Conway's principal work was done upon the Peaks of Sorata (21,500 ft.) and Illimani (21,200 ft.). The collection is a small one, numbering only forty-

* H. A. Weddell: Notice Biographique par M. Eug. Fournier. (Comptes Rendus du Congrès Intern. de Botanique et d'Horticulture), Paris, 1880, p. 19.

† *Chloris Andina*: Essai d'une Flore de la Région alpine des Cordillères de l'Amérique du Sud, par H. A. Weddell. 2 vols. Paris, 1855, 1857.

‡ Weddell: *Chloris Andina*, Preface.

six species. Eight of these were found at or above 18,000 ft., and include two from a locality 18,700 ft. above sea-level: these, the highest andine plants on record, are *Malvastrum flabellatum*, Wedd., and a grass, *Deyeuxia glacialis*, Wedd.

In a preliminary account* of his explorations, speaking of the Puna—a plateau 12,000–13,000 ft. above sea-level, which is bounded on the East by the Cordillera Real of which Sorata and Illimani are the highest peaks—Sir Martin Conway tells us that “a great part of the year is completely rainless, but from the beginning of December till the end of March or April rain is precipitated very frequently and with great violence. During the remainder of the year the slopes and plains are swept by dry winds, and sometimes scorched by a very hot sun so that, except at very high levels of perpetual snow, where bad weather lasts over a longer period, the surface of the whole country is dried and baked. In the rainy season mud avalanches fall down the slopes, gullies are deepened, every stream is in flood, waterways are ploughed in various directions in the plain, and all the rivers eat their way back.”†

The flora of the high regions “appeared to us very sparse, though it is only fair to say that the rainy season must be the time when the flowers are most numerous, and as we quitted the country before the actual commencement of the rains we probably only encountered the earlier flowers The flowers we found were much scattered about, one here, another there, but we never came across any carpet of blossoms such as form the great attraction of many high mountain regions.”‡

Many of the plants in the following list bear flowers which appear to be adapted to fertilization by insects. As bearing indirectly upon the probability of the existence of insects at high levels in this region, the following remarks are interesting: “Up to an altitude of 17,000 ft., in suitable places, birds were numerous, and in a little tarn close to our base camp on Mount Sorata, at 16,000 ft. above the sea, we shot geese, gulls, wild duck, and snipe, besides several small birds; we saw a number of rather large green-headed humming-birds.”§

The plants from the higher elevations in this collection are

* Journ. R. Geogr. Soc. xiv. (1899), p. 14 *et seqq.* † *L. c.* p. 16.

‡ *L. c.* p. 20. § *L. c.* p. 20.

alike in habit, in which they resemble also the high-level plants of other portions of the world. The subaerial parts are dwarfed and seldom rise more than three inches above the surface of the ground. The leaves are usually thick with a distinct tendency to fleshiness. Extreme hairiness and a very coriaceous texture are alike uncommon. The leaves are very commonly disposed in the form of a rosette; many plants of the same species are frequently crowded together, giving rise to the turf-formation* so frequently met with in cold and exposed situations. On the other hand, the subterranean organs attain an enormous development, which is seemingly out of all proportion to that of the aerial parts to which they belong. The root-system is usually either monopodial, consisting of a deep stout taproot and its widely extended branches, or a fascicle of more or less fleshy roots. Since the upper layers of the soil are usually at a temperature considerably below the minimum at which root-activity is possible, this fact is of great biological importance. In this connection it may be mentioned that the collection consists entirely of perennials; annual plants are very rare, if indeed they exist at all, at high elevations.

Omitting introduced species, the Conway collection contains thirty-eight species from 12,000 ft.† and above. These are distributed among thirty-one genera and twenty-one Natural Orders.

Of the Natural Orders, the Loasaceæ (one species at 15,000 ft.) are an essentially andine group, and are represented in the Old World only by the monotypic African and Arabian genus *Kissenia*. Cactaceæ (one species at 14,270 ft.) is almost endemic; only one genus, *Rhipsalis*, being indigenous in the Old World. Valerianaceæ (one species at 18,000 ft.), though well represented in the Old World, attains a much greater and remarkable development in South America, particularly in the Andes. Weddell enumerates no less than twenty-nine alpine species of *Valeriana*‡. Fourteen species in the Conway Collection—rather more than one-third of the whole—belong to the Compositæ, the

* Warning: Ökol. Pfl.-Geogr.; German trans., Berlin (1896), p. 39.

† Ball places the lower limit of the alpine zone on the Puna at 12,000 ft. Journ. Linn. Soc., Bot. xxii. (1885) p. 6.

‡ *Chloris Andina*, ii. pp. 17 et seq.

only Order which is represented by more than two species. One-third of Ball's alpine collection obtained above Chicle, 4° farther north, was composed of members of this Order*. A similar predominance of the most widespread modern group of plants obtains at high elevations in all parts of the world. It is interesting to note that of these fourteen species, one only (*Perezia carulescens*) belongs to the typically andine subgroup Mutisiaceæ.

Of the thirty-one genera represented at and above 12,000 ft., two, each represented by one species only, viz., *Adesmia* and *Blumenbachia*, are andine†. *Echinocactus*, *Baccharis*, *Perezia*, and *Bomarea* are more widely distributed in America, but do not occur in the Old World; the two latter having their greatest development in the Andes. Four others, *Malvastrum*, *Lupinus*, *Werneria*, and *Bystropogon*, are centred in the Andes, but are represented in the Old World by a few outlying species. To these we may apply the term "Amphigean." *Azorella* and *Ourisia* are confined to the Southern Hemisphere; *Azorella* extends into the Antarctic islands, and *Ourisia* is represented by six species in New Zealand. The remaining nineteen genera are cosmopolitan. Expressing these results in tabular form we have :—

Andine	genera	2=6.4 per cent.
American	"	4=12.8 " "
Amphigean	"	4=12.8 " "
South Temperate	"	2=6.4 " "
Cosmopolitan	"	19=61.2 " "

On comparing these results with those obtained by an analysis of the plants collected by the Fitzgerald Expedition on the slopes of Aconcagua below 14,000 ft., we find a larger proportion of endemic genera. This collection contains forty-two genera‡, of which ten are endemic in South America, and three others centred in the Andes but extending into North America. Three are at home in the South Temperate zone and four may

* Ball, in Journ. Linn. Soc., Bot. xxii. (1885) p. 10.

† *i. e.* endemic in South America and either confined to the Andes or centred therein.

‡ Burkill in Fitzgerald's 'Highest Andes,' London, 1899, p. 369.

be classed as Amphigean. Thus we have

South American..	23·8	per cent.
American.....	7·1	„ „
Amphigean	9·5	„ „
South Temperate..	7·1	„ „
Cosmopolitan....	52·3	„ „

A comparison of these figures with those in the preceding table points to the conclusion that the flora of the upper* alpine zone of the Andes contains a smaller proportion of endemic elements than that of the lower alpine and subalpine zones.

This generalization is found to be equally true for the other high-level regions of the world.

The natural orders and genera represented in the alpine zone in the Bolivian Andes do not afford much indication of the specialization of the flora. The species, however, are usually very local. Those comprising the Conway collection are peculiar to the New World and all but one are confined to South America; the exception is *Lobelia nana*, which extends northward into Mexico. Of the thirty-one alpine species which are certainly identified, eight are found only in the Bolivian Andes, eleven extend northward into Peru, two to Ecuador, six to Venezuela or Colombia, and three are common to the whole length of the Andes.

It has already been mentioned that two of Conway's plants are from an elevation of 18,700 ft. In addition to these, six others are from an elevation of 18,000 ft. or upwards, viz.: *Saxifraga Cordillerarum*, Presl, var. *trigyna*, Engl., *Valeriana nivalis*, Wedd., *Werneria dactylophylla*, Sch.-Bip., *W. Man-doniana*, Wedd., *W. pygmæa*, Gill.?, and a species of *Draba*.

RANUNCULACEÆ.

ANEMONE INTEGRIFOLIA, *H. B. K. ex DC. Syst. Veg.* i. 217; *Wedd. Chloris Andina*, ii. t. 83 A. *Hepatica?* *integrifolia*, *DC. Syst. Veg.* i. 217; *H. B. K. Nov. Gen. et Sp.* v. 40. *Hamadryas andicola*, *Hook. Ic. Pl.* t. 137.

* All but three of the genera considered in the table relating to Conway's collection are represented above 14,000 ft.

37. Near top of Huallata Pass, 14,110 ft. 65. The Puna.
 "Common fuel-moss."
 Andes of Bolivia and Peru, 9000-17,000 ft.

CRUCIFERÆ.

- DRABA AFFINIS, *Hook. f. Fl. Antarct.* 235?
 Near Rocktooth Camp, Mount Sorata, about 16,000 ft.
 The specimen is too poor to be certainly identified.

VIOLACEÆ.

- VIOLA PYGMÆA, *Juss. ex Poir. in Lam. Encycl. Méth.* viii.
 630; *Wedd. Chloris Andina*, ii. t. 87 B.
 38. Near the top of Huallata Pass, 14,110 ft.
 Andes of Bolivia and Peru, above 12,000 ft.

CARYOPHYLLACEÆ.

- CERASTIUM MUCRONATUM, *Wedd. in Ann. Sc. Nat. Sér. V.* i.
 (1864) 294.
 6. Illimani, Camp 3, 16,500 ft.
 Andes of Bolivia and Peru.

HYPERICACEÆ.

- HYPERICUM THESIIFOLIUM, *H. B. K. Nov. Gen. et Sp.* v. 192.
H. silenoides (*non Juss.*), *H. indecorum*, *H. tarquense*, *H. multiflorum*, *H. uliginosum*, *H. B. K. Nov. Gen. et Sp.* v. 191 *et sqq.*
 48. High up on the south side of Huallata Pass; about
 14,000 ft.
 Andes, from 5000 to 14,000 ft.

MALVACEÆ.

- MALVASTRUM FLABELLATUM, *Wedd. Chloris Andina*, ii. 281.
 35. On ascent from Hiska Hankaña to Rocktooth Camp at
 about 18,700 ft.
 Andes of Bolivia above 14,000 ft.

GERANIACEÆ.

- ERODIUM CICUTARIUM, *L'Hérit. ex Ait. Hort. Kew*, ed. 1, ii.
 414. *Geranium cicutarium*, *Linn. Sp. Pl.* 680.
 63. La Paz racecourse. 18. Umapusa, 14,270 ft.

From the Himalayas westwards through the Mediterranean region to Britain; from Vancouver Island southwards through the Rocky Mountains and the Andes to the Falkland Islands (apparently introduced into America).

OXALIS LOTOIDES, *H. B. K. Nov. Gen. et Sp.* v. 241. *O. medicago*, *H. B. K. Nov. Gen. et Sp.* v. 241; *Hook. Ic. Pl.* vii. t. 661. *O. pichinchensis*, *Benth. Pl. Hartweg.* 166.

46. High up on south side of Huallata Pass.

Andes, from Venezuela to Bolivia, ascending to 12,000 ft.

LEGUMINOSÆ.

ADESMIA SPINOSISSIMA, *Meyen, Reise um die Erde*, ii. 27.

54. Hiska Hankaña and neighbourhood.

The same plant was collected by Mandon (No. 728) in the Bolivian Andes at about 13,000 ft.

ASTRAGALUS UNIFLORUS, *DC. Astragalologia*, 243, t. 50.

39. Near top of Huallata Pass, 14,110 ft.

Andes of Peru and Bolivia.

MEDICAGO DENTICULATA, *Willd. Sp. Pl.* iii. 1414.

64. La Paz, on the racecourse.

Europe, Canary Islands, Mediterranean region, Abyssinia, N.W. India and Central Asia, China, and Japan; introduced into America.

LUPINUS sp.

9. Illimani, near 1st Camp, 14,000 ft.

SAXIFRAGACEÆ.

SAXIFRAGA CORDILLERARUM, *Presl, Reliq. Hænk.* ii. 55, var.

TRIGYNA, *Engler, Monogr. Saxifr.* 184. *S. trigyna*, *Rémy, in Ann. Sc. Nat. Sér. III.* viii. (1847) 235; *Wedd. Chloris Andina*, ii. 213 (*a* only).

Near Rocktooth Camp, about 18,000 ft.

Bolivian Andes, to the highest limits of phanerogamic vegetation.

LOASACEÆ.

BLUMENBACHIA CHUQUITENSIS, *Hook. f. Bot. Mag.* t. 6143.

Loasa chuquitensis, *Meyen, Reise um die Erde*, i. 483 (*note***).

23. Frasciya, 15,000 ft.

Peruvian and Bolivian Andes.

CACTACEÆ.

ECHINOCACTUS sp.

16. Umapusa, 14,270 ft. Specimen insufficient to determine the species.

UMBELLIFERÆ.

AZORELLA DIAPENSIODES, *A. Gray, Bot. U.S. Expl. Expea. i. 702; Wedd. Chloris Andina, ii. 190. A. glabra, Wedd. loc. cit. t. 67 A.*

65. Vilahaque Hill, about 14,500 ft.

The High Andes of Bolivia and Peru.

VALERIANACEÆ.

VALERIANA NIVALIS, *Wedd. Chloris Andina, ii. t. 48 A.*

34. On ascent from Hiska Hankaña to Rocktooth Camp. Common about 18,000 ft. 52. Pana.

The Bolivian Andes at the snow-limit.

COMPOSITÆ.

ASTER LIMNOPHILUS, *Hemsl. & H. H. W. Pearson. Erigeron frigidum, Wedd. Chloris Andina, i. 231 (non Boiss.). E. limnophilus, Sch.-Bip. Bull. Soc. Bot. Fr. xii. (1865) 81.*

BOLIVIA, La Paz, 16,400 ft., *Mandon, 225, 226; Hiska Hankaña, 16,600 ft., Conway, 28; Andes of Yungas, 14,000-15,000 ft., Pearce.*

BACCHARIS GENISTELLOIDES, *Pers. Syn. ii. 425; Mart. Fl. Bras. vi. pt. 3; Var. typica, Hook. Bot. Misc. ii. (1831) t. 94. Conyza genistelloides, Lam. Encycl. Méth. ii. 93. Molina reticulata, Lessing, Linnæa, vi. 142.*

8. Illimani, near 1st Camp, at 14,000 ft.

Between 14,000 and 15,000 ft. on the Andes from Bolivia to Colombia.

BACCHARIS SUBPENNINERVIS, *Sch.-Bip. in Linnæa, xxxiv. (1865-66) 532.*

10. Illimani, near 1st Camp, at 14,000 ft.

Andes from Bolivia to Peru.

BACCHARIS ALPINA, *Wedd. Chloris Andina, i. 168, t. 28 (?).*

24. Frasciya, about 15,000 ft.

BACCHARIS MICROPHYLLA, *H. B. K. Nov. Gen. et Sp. iv. 55 B. Incarum, Wedd. Chloris Andina, i. t. 29.*

11. Illimani, near 1st Camp, at 14,000 ft.

Andes, from Venezuela to Bolivia, ascending to 14,000 ft.

ERIGERON BRITTONIANUM, *Rusby, in Mem. Torr. Bot. Club*, iii No. 3 (1893), 54.

36. Hiska Hankaña. 44. High up on the S. side of Huallata Pass.

Bolivian Andes.

SENECIO ADENOPHYLLOIDES, *Sch.-Bip. in Bonplandia*, iv. (1856) 55.

4. Illimani, on moraine, at about 16,000 ft.

Andes of Bolivia and Peru at 13,000 ft., and above.

SENECIO sp. (*cf.* S. LINEARIFOLIUS, *Poepp.*).

25. Frasciya, at about 15,000 ft.

The same plant was collected at Culluy by Matthews (640).

SENECIO sp.

13. Illimani, near 1st Camp, at 14,000 ft.

WERNERIA DACTYLOPHYLLA, *Sch.-Bip. in Bonplandia*, iv. (1856) 55; *Wedd. Chloris Andina*, i. 87.

32. On ascent from Hiska Hankaña to Rocktooth Camp, at about 18,000 ft.

Andes of Bolivia and Peru at high levels.

WERNERIA MANDONTIANA, *Wedd. in Bull. Soc. Bot. France*, xii. (1865) 80.

29, 30, 31. On ascent from Hiska Hankaña to Rocktooth Camp, at about 18,000 ft.

Mt. Sorata.

WERNERIA PYGMÆA, *Gill. ex Hook. Journ. Bot.* iii. (1841) 348; *Wedd. Chloris Andina*, i. 84, t. 16 B.

21. Umapusa, 14,270 ft.

Alpine region of the Andes from Venezuela to Chili.

WERNERIA PYGMÆA, *Gill.* ?

"About 18,000 ft."

The specimen is too meagre for certain identification.

WERNERIA HETEROLOBA, *Wedd. Chloris Andina*, i. 88, t. 16 A?

51. Puna.

Material too small and immature for certain identification.

BARNADESIA POLYACANTHA, *Wedd. Chloris Andina*, i. 13, t. 1 A.

40. On the way down towards Sorata.

Andes of Ecuador and Bolivia, between 8000 and 11,000 ft.

PEREZIA CÆRULESCENS, *Wedd. Chloris Andina*, i. 39, t. 10 A.

2. Illimani, near 1st Camp at 14,000 ft. 56. Hiska Hankaña and neighbourhood, at about 16,000 ft.

Andes of Peru and Bolivia, from 13,000 ft.

HYPOCHERIS SESSILIFLORA, *H. B. K. Nov. Gen. et Sp.* iv. 2.

Oreophila sessiliflora, *D. Don, in Trans. Linn. Soc.* xvi. (1830) 178. *Achyrophorus sessiliflorus*, *DC. Prodr.* vii. 95.

55. Hiska Hankaña and neighbourhood. 61. South slope of Huallata Pass.

Alpine region of the Andes, from Colombia to Bolivia.

CAMPANULACEÆ.

LOBELIA NANA, *H. B. K. Nov. Gen. et Sp.* iii. 317, t. 272 ; *Wedd. Chloris Andina*, ii. 13, t. 46 A.

45. High up on S. side of Huallata Pass. 59. Hiska Hankaña and neighbourhood. 60. Theodolite station 6, Puna, near Achacache. 59 and 60 are stoloniferous.

Mexico and the Bolivian Andes.

CENTROPOGON sp.

42. On the way down towards Sorata.

VACCINIACEÆ.

VACCINIUM PENÆOIDES, *H. B. K. Nov. Gen. et Sp.* iii. 264 ; *Wedd. Chloris Andina*, ii. 178, t. 73 A.

7. Illimani, Camp 3, 16,720 ft.

Andes, from Venezuela to Bolivia, from 9000 ft. to the snow-limit.

PLUMBAGINACEÆ.

PLUMBAGO SCANDENS, *Linn. Sp. Pl.* ed. 2. 215 ; *H. B. K. Nov. Gen. et Sp.* ii. 220 ; *Mart. Fl. Bras.* vi. part 4, p. 165, t. 46. f. 2.

43 & 44. On the way down towards Sorata.

Widely distributed in the West Indies and Tropical America from sea-level to about 9000 ft. in the Andes.

GENTIANACEÆ.

GENTIANA SEDIFOLIA, *H. B. K. Nov. Gen. et Sp.* 173, t. 225 ; *Wedd. Chloris Andina*, ii. 73, t. 52 B.

1. Illimani, near 1st Camp, at about 14,000 ft. 20 and 22. Umapusá, at about 14,500 ft. 50. Puna.

Andes from Colombia to Chili ; very common between 10,000 and 17,000 ft.

BORAGINÆÆ.

ERITRICHIMUM sp. (*cf.* E. PYGMÆUM, *Wedd. Chloris Andina*, ii. 89).

62. Southern slope of Huallata Pass.

The same plant was collected in the subalpine region of Sorata by Mandon (No. 383).

SOLANACEÆ.

SOLANUM PALLIDUM, *Rusby, in Mem. Torr. Bot. Club*, iv. (1895) 228.

On the way down towards Sorata.

Bolivian Andes between 8000 and 10,000 ft.

SCROPHULARIACEÆ.

CALCEOLARIA DEFLEXA, *Ruiz & Pav. Fl. Per.* i. 18, t. 30 b. *Fagelia deflexa*, *O. Kuntze, Rev. Gen. Pl.* i. 459 ; *Rusby, in Mem. Torr. Bot. Club*, vi. (1896) 93.

41. On the way down towards Sorata.

MIMULUS sp. (*cf.* M. LUTEUS, *Linn. Pl.* ed. 2. 884).

57. Hiska Hankaña and neighbourhood, at about 16,000 ft. The single specimen is too poor for satisfactory determination.

OURISIA MUSCOSA, *Benth. in DC. Prodr.* x. 493 ; *Wedd. Chloris Andina*, ii. 117, t. 60 A.

26. Hiska Hankaña at about 16,500 ft.

Andes from Pichincha to Sorata at 14,000 ft. and upwards.

LABIATÆ.

BYSTROPOGON CANUS, *Benth. Lab.* 326.

12. Illimani, near 1st Camp, at 14,000 ft.

Andes from Venezuela to Bolivia.

MICROMERIA BOLIVIANA, *Benth. Lab.* 731 ; *Wedd. Chloris Andina*, ii. 149, t. 63 B.

3. Illimani, near 1st Camp, at 14,000 ft.

Andes of Peru and Bolivia, from 9000 to 14,000 ft.

AMARYLLIDACEÆ

BOMAREA GLAUCESCENS, *Baker, in Journ. Bot.* xx. (1882) 201.

5. Illimani, Camp 3, at about 16,700 ft.

Alpine region of the Andes of Ecuador, Peru, and Bolivia.

BOMAREA GLAUCESCENS, var. PUBERULA, *Baker, loc. cit.*

14. Illimani, about 11,500 ft., just below Atahuaillani.

Subalpine region of the Andes of Peru and Bolivia.

GRAMINEÆ.

DEYEUXIA GLACIALIS, *Wedd. in Bull. Soc. Bot. Fr.* xxii. (1875) 178.

33. On the ascent from Hiska Hankaña to Rocktooth Camp, at about 18,700 ft.

The Bolivian Andes at 16,000 ft. and upwards.

(It is not certain that the leaves and inflorescences really belong to the same plant, and therefore some doubt attaches to this determination.)

Redescriptions of Berkeley's Types of Fungi.—Part II. By
GEORGE MASSEE, F.L.S., Principal Assistant (Cryptogams),
Herbarium, Royal Gardens, Kew.

[Read 2nd May, 1901.]

(PLATES 4 & 5.)

THE following is a continuation, on the same plan, of the work commenced in this Journal, vol. xxxi. p. 462, and includes all the species of *Discomycetes* and *Hysteriaceæ*, of which type specimens exist at present in the Kew Herbarium.

PEZIZA ELAPHINES, *Berk. & Broome, in Ann. & Mag. Nat. Hist.* Ser. IV. vii. (1871) p. 434, tab. 19. f. 18.

Gregarious, sessile, base somewhat narrowed, subglobose and closed, then expanding and becoming saucer-shaped, about $\frac{1}{2}$ mm. diameter; disc pale grey, externally pale buff, margin paler, everywhere covered with cylindrical, obtuse, continuous or septate, brownish hairs, which are parallel at the margin, $30-70 \times 5-6 \mu$; asci narrowly cylindric-clavate, base stout, apex slightly narrowed, and the pore blue with iodine, about $50 \times 6 \mu$; spores 8, irregularly 2-seriate, continuous, hyaline, narrowly cylindrical,