Primulaceæ from Western Yunnan and Eastern Tibet.

BY

GEORGE FORREST.

With Plates XXVI—XLIII.

Many and interesting as are the specimens of Primulaceæ that have become known in recent years from Yunnan and Tibet, the forms which I describe below will serve to indicate that the area is yet far from being exhausted of novelties. Of the thirty-nine species of *Primula* in my collection enumerated here, fifteen are new; of seven species of *Androsace*, one is new; and of thirteen species of *Lysimachia*, three are new. Many of them are of great beauty and should be welcome additions to the hardy plants of gardens of this country, and I am glad to say that seedlings of several of the best of them have been raised and will probably be within reach of horticulturists in the course of this year (1908).

The most interesting amongst the known species of the collection are *P. vincaeflora*, *P. Delavayi*, and *P. Franchetii*, three of the four species at present constituting the remarkable section *Omphalogramma*, which takes its name from the oval and flattened form of the seed. Certainly no one with knowledge of the form of seed usually met with in *Primula* would suppose at first sight that the seed belonged to a species of that genus. Franchet, who described the bulk of the collections made by Père Delavay in the region from which the above came, was so struck by their singular appearance that he

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formed of them a sub-genus of *Primula*, which Pax and Knuth, in their recent monograph of the order, retain as a section.

Each of the species mentioned has a distinct beauty of its own.

That with the largest flowers is *P. Franchetii*. Its blooms—solitary, as in all known species of the section—are fully two inches in length, and the expanded limb is almost two inches across, of a deep rich violet shading into the yellowish corolla-base.

P. Delavayi somewhat resembles the above, but is not nearly so imposing a plant, being smaller in every way, the deep fringing of the ruddy purple corolla segments being its conspicuous feature.

Both these species are generally found growing as solitary specimens in scattered groups.

P. vincaeflora is, in my opinion, as seen growing, the finest of the three. It is a much taller plant than the others, some specimens attaining a height of 14 inches or even more. Also, it grows in masses of 20 to 30 plants, a feature which enhances its beauty, and which I have never noted in the others. The flowers are of a deep indigo purple, the tube narrowly cylindrical, yellowish at base, the limb very widely spread, with the three upper lobes reflexed on the tube. This last peculiar character is not noticeable in dried specimens, and, probably for this reason, Franchet has not remarked on it in his description. Nevertheless it is quite constant, and is shown most perfectly in photographs of the species *in situ* taken by me. None of the many primulas I have seen can compare in beauty with this unique plant growing in its natural habitat, which is sheltered grassy openings in pine forests at an altitude of 10,000-11,000 ft. I should say it will prove perfectly hardy in this country, and will indeed be an acquisition.

The other two species I have mentioned grow at a greater altitude, generally from 12,000-13,000 feet, in moist and rocky, but not boggy, meadows, all three being commonly on chalky or limy soil.

It is interesting to note that the only other known species in the section is *P. Elwesiana*, from the Sikkim-Himalaya. The flora of the extension of the Himalaya mountains from that

point up to their entrance into Yunnan has, so far, been untapped, but almost certainly, once the country becomes more opened up, we shall have other and perhaps more beautiful species added to those mentioned.

Among the new species are many unique and beautiful forms, prominently *P. Littoniana* and *P. Forrestii*.

The former is a superb species of the section *Capitatae*, with flowers in densely-crowded spikes of 2-3 inches in length, each bearing hundreds of small, deflexed, fragrant blooms of a deep purplish-blue; but the remarkable feature of the species is the magnificent colouring of the calyces, which are of a vivid scarlet-crimson, and form a most striking contrast to the rich blue of the expanded flowers. The plants grow in crowded masses, generally in moist, grassy openings in pine forests at an altitude ranging from 10,000-11,000 feet.

P. Forrestii, of the section *Callianthae*, is a curious as well as a beautiful species, and a lover of dry stony situations. The flowers are large and numerous, of a rich deep shade of orange, and fragrant. The foliage is densely coated with glandular hairs, and, in the fresh state, has a peculiar, but not unpleasant, aromatic odour. The plant is specially adapted to the situation in which it is commonly found, *i.e.*, the crevices of dry, shady limestone cliffs, in having a long, intensely tough, woody root-stock of 2-3 ft. in length. The base of this is very tapered, generally only a few inches being enclosed in the crevices of the rocks. From this point the plant is pendulous for almost the full length of the remainder of the rootstock, a few inches of the growing apex being turned out and upwards. The rootstock for two-thirds of its length is covered with the induviæ of previous year's foliage, which, at the apex, form a dense matted mass, with the fresh foliage and flowers arising from the centre. Judging from the length of the rootstocks of specimens seen growing, allowing two whorls of leaves for one year's growth, a liberal estimate, some plants must reach the age of 50-100 years. Another feature which pointed to great age in the species was, the cliffs behind some of the larger specimens were scored and worn to the depth of fully an inch by the motion of the plants in the wind.

Another most interesting new species is *P. Bulleyana*. This is a tall moisture-loving plant of two, or in abnormal specimens fully three feet in height. In foliage it somewhat resembles *P. serratifolia*, Franch., but its special feature lies in the rich colouring of the flowers, which are of a deep reddish-orange shade, when in bud a velvety crimson, of large size, and in numerous dense whorls. Like most of the alpine or sub-alpine primulas, this species grows in huge colonies, and to see several acres densely covered with such plants is a sight ever to be remembered.

All the photographs from which the plates have been made to illustrate this paper were taken by Mr. Robert Adam, of the Royal Botanic Garden, excepting those taken by myself of the plants in their habitats.

PRIMULA.

Primula (Sinenses) obconica, Hance. Pax, Monog., p. 22.

Dry clefts of limestone cliffs on hills north of Yunnan-fu. Lat. 25° N. Alt. 7,000-9,000 ft. Yunnan, S.W. China. February, 1905. G. Forrest. No. 312.

Primula (Sinenses) Listeri, King. Pax, Monog., p. 24.

Plant of 4-8 inches. Flowers from rose-lavender to white according to situation; faintly fragrant. On moist, moss-covered ledges of cliffs, open or shady situations, in the side valleys on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 9,000-10,000 ft. April-May, 1906. W. Yunnan, China. G. Forrest. No. 1,815.

Plant of 4-8 inches. Flowers white, eye greenish-yellow, fragrant. Dry, rocky pasture land in the Yang-pi valley, western slopes of the Tali Range. Lat. 25° 30′ N. Alt. 7,000-9,000 ft. May, 1906. W. Yunnan, China. G. Forrest. No. 4,101.

Primula (Sinenses) langkongensis, G. Forrest. Sp. nov. Plate xxvi.

Tota pube breviuscula vestita. Folia petiolata lamina late ovata 3-6 cm. longa 3-5 cm. lata obtusa basi late et profunde cordata sinuata crenata; petioli 6-11 cm. longi. Scapus crassus 12-25 cm.

altus umbellas 2-4 superpositas 2-4-floras gerens; bracteæ foliaceæ ovato-lanceolatae 5-8 mm. longae. Pedicelli 1-2 cm. longi. Calyx foliaceus late campanulatus sub anthesi 6-8 mm. longus post anthesin accrescens 8-13 mm. longus 9-12 mm. diametiens extus pubescens et glandulosus ad medium usque fissus lobis late ovatis irregulariter dentatis. Corollae tubus calycem superans basi cylindricus sursum in dimidio superiore infundibuliformis fauce annulato; limbus 2-2·5 cm. diam. lobis late obovatis bilobatis. Capsula globosa calyce multo brevior.

Open mountain pasture land on the divide between the Hoching-cho and Lang-kong Hsien valleys. Lat. 26° 30′ N. Alt. 10,000-11,000 ft. August, 1906. N.W. Yunnan, China. G. Forrest. No. 2,779.

Allied to *P. malvacea*, Franch., but differing in the foliaceous, non-accrescent calyx, in the longer and expanded corolla tube, and the larger limb of the corolla.

Primula (Sinenses) cortusoides, Linn., var. **lichiangensis,** G. Forrest. Var. nov. Plate xxvii.

Planta 15-35 cm. alta omnino pubescens sed praesertim super petiolos scapique partem infimum pube densissime vestita. Folia petiolata 5-8 cm. longa 3-5 cm. lata, ovato-oblonga profunde cordata, lobata dentataque; petioli 5-10 cm. longi. Scapus crassus 20-35 cm. altus, umbellam unam 5-8 floram rarius umbellas duas superpositas gerens; bracteae lanceolatae 5-10 mm. longae; pedicelli validi 1-2·5 cm. longi tomentosi. Flos fragrans. Calyx campanulatus 8-14 mm. longus alte fissus, lobis 8-9 mm. longis lanceolatis conspicue costatis foliaceis rigidis atrovirentibus glanduloso-pubescentibus praesertim versus basin. Corollae roseae faux virido-luteus; tubus calycem paullo superans 10-15 mm. longus sursum infundibuliformis; limbus 2-2·7 cm. lobis late obovatis bilobatis. Capsula oblonga glabra.

Plant of 6-14 inches. Flowers rich rose-red, almost crimson in specimens in shady situations; eye greenish-yellow, fragrant. On very steep, rocky slopes and ledges of inaccessible limestone cliffs in a very shaded side valley on the eastern flank of the Lichiang Range. Lat. 27° 10′ N. Alt. 10,000-10,500 ft. June, 1906. N.W. Yunnan, China. G. Forrest. No. 2,275.

This plant is very near *P. Veitchii*, Duthie, from which it differs in its inflated calyx-base, fewer flowers in the umbel, and the usually simple umbel; only rarely is there another one superposed. My plant, like *P. Veitchii*, is, I believe, only a form of the variable *P. cortusoides*, Linn.

This is a very handsome rock species, varying in the form of the foliage and the colour of the flowers, which range from light rose to almost crimson in some specimens. It delights in dry, shady places on the ledges of limestone crags and, though abundant enough in such situations, is local in its distribution.

Primula (Sinenses) septemloba, Franch. Pax, Monog., p. 30.

Plant of 8-18 inches. Flowers deep purplish-rose, fragrant. Moist, shady situations amongst scrub on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 10,000-11,000 ft. July-August, 1906. W. Yunnan, China. G. Forrest. No. 1,811.

Plant of 7-14 inches. Flowers rose-crimson, semi-pendulous, fragrant. Shady, damp situations in mixed forests in side valleys on the eastern flank of the Lichiang Range. Lat. 27° 10′ N. Alt. 10,000 ft. June, 1906. N.W. Yunnan, China. G. Forrest. No. 2,276. Differs slightly in having the calyx not quite glabrous.

Primula (Monocarpicae) malacoides, Franch. Pax, Monog., p. 33. Plate xxviiiB.

Bunds of padi fields, and shady situations in the Hong-Ai and other surrounding valleys. Flowers rose-lavender. Lat. 25° 20′ N. Alt. 5,000-6,000 ft. January, 1905. S.W. Yunnan, China. G. Forrest. No. 399.

Growing apparently wild inside the city wall, Talifu. Lat. 25° 40′ N. Alt. 6,500 ft. January, 1905. W. Yunnan, China. G. Forrest, No. 399A.

Plant of 6-14 inches. Flowers rose-lavender, eye orange, fragrant. Dry and moist, open and shady situations in the Talifu valley. Lat. 25° 40′ N. Alt. 6,500-7,000 ft. September-October, 1906. W. Yunnan, China. G. Forrest. No. 1,802.

This is a charming plant, one of the finds of Père Delavay, but very local, only so far having been found in the Tali valley, around the city of that name, where it is abundant. It seems to thrive best in rather moist, sunny situations. It is new to cultivation, only this year having been raised from seed.

Primula (Monocarpicae) androsacea, Pax, Monog., p. 34.

Growing profusely on bunds of padi fields in the Li Ho valley and others to the south. Flowers rose, with orange centre. Lat. 25° 18′ N. Alt. 6,000-8,000 ft. January, 1905. S.W. Yunnan, China. G. Forrest. No. 311.

Primula (Monocarpicae) minutiflora, G. Forrest. Sp. nov.
Plate xxixB.

Annua (?) tota pube breviuscula vestita efarinosa. Folia petiolata lamina rotundato-ovata cordata 11-15 mm. longa 10-13 mm. lata prominenter regulariterque crenata; petioli 2-4 cm. longi. Scapus tenuis 4-8 cm. altus umbellam simplicem 4-5-floram vel umbellas 2 superpositas gerens; bracteae ovatae 4 mm. longae 2 mm. latae; pedicelli tenues 13-16 mm. longi. Calyx late campanulatus 3-5 mm. longus alte fissus, lobis ovatis obtusis extus rubro-luteis. Corollae pallide roseae tubus calycem aequans; limbus hypocrateriformis 6 mm. diametiens lobis late ovatis integris. Capsula globosa.

Borders of cultivation in the Hong Ai valley. Lat. 25° 30′ N. Alt. 5,000-6,000ft. January, 1905. W. Yunnan, China. G. Forrest. No. 310.

Allied to *P. androsacea*, Pax, but differing in being completely efarinose, in the broad bracts, the large, widely-spread calyx, and the entire lobes of the corolla.

Primula (Petiolares) petiolaris, Wall., var. **sulphurea,** Hook, fil. Pax, Monog., p. 41.

Growing amongst snow in pine forests on the ascent of the Niu Chang Pass, the eastern watershed of the Yangtze river. Lat. 27° 36′ N. Alt. 14,000 ft. December, 1904. N.W. Yunnan, China. G. Forrest. No. 304.

Primula (Petiolares) gratissima, G. Forrest. Sp. nov.
Plate xxxB, xxxi.

Planta 5-10 cm. alta squamis vaginantibus plurimis late ovatis vel ovato-lanceolatis rubro-luteis densissime praesertim in primo evolutione farinosis basi cincta. Folia membranacea obovato-spathulata basi attenuata 7-9 cm. longa 2-3 cm. lata post flores evoluta irregulariter et late dentata glabra vel versus basin sparsim farinosa. Scapus robustus 5-8 cm. altus glaber vel sparsim farinosus, umbellam simplicem 4-10-floram gerens; bracteae ovatae vel ovato-lanceolatae acuminatae; pedicelli validi carnosi 10-14 mm. longi. Calyx sub anthesi anguste campanulatus 5-7 mm. longus, post anthesin late expansus, lobis inaequalibus late ovatis apice 2-3-dentatis. Corollae cyaneae tubus calycem longe superans 11-13 mm. longus infundibuliformis pallide flavido-albus ore flavido annulato praeditus; limbus 18-25 mm. diametiens, lobis late obovatis irregulariter et argute dentatis. Capsula globosa calycis tubo dilatato inclusa.

Plant of 2-4 inches. Flowers appearing before foliage is developed. Corolla bright blue, eye pale yellowish-white. Moist, rocky situations in beds of mountain streams, and on mountain meadows at verge of snow. Eastern flank of the Lichiang Range. Lat. 27° 12′ N. Alt. 11,500-13,000 ft. May, 1906. N.W. Yunnan, China. G. Forrest. No. 2,167.

Plant of 3-5 inches. Flowers light or dark blue, eye and tube green. Moist, shady situations by sides of streams in side valleys on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 11,000-12,000 ft. July-August, 1906. W. Yunnan, China. G. Forrest. No. 1,808.

Plant of 2-4 inches. Flowers pure white, eye orange. Open mountain meadows on the edge of the snow-line near the summit of the Tali Range. Lat. 25° 40′ N. Alt. 13,000 ft. June, 1906. W. Yunnan, China. G. Forrest. No. 1,812. A variety with the flowers pure white.

Allied to *P. odontocalyx*, Franch., but differing in the large, densely farinose squamæ at base and the broader unequal bracts.

A charming alpine, and one of the first to show on the disappearance of the snows. In many instances I found specimens which had actually forced their way through the snow. In such cases the surrounding white showed to the greatest advantage the rich blue of the flowers. Situations very moist.

Primula (Petiolares) taliensis, G. Forrest. Sp. nov. Plate xxxii.

Planta tota breviter hispida. Folia obovato-spathulata in petiolum late alatum attenuata 3-3·5 cm. longa 10-15 mm. lata alte et irregulariter serrata. Scapus robustus brevis foliis dimidio brevior sæpiusve minor umbellam simplicem 2-6-floram gerens; bracteae lanceolatae acutae 3-4 mm. longae; pedicelli validi erecti 12-16 mm. longi. Calyx campanulatus vel late infundibuliformis, tubo lobis late lanceolatis acuminatis triente longiore. Corollae tubus calycem longe superans 8-12 mm. longus basi cylindricus sursum paullo ampliatus fauce luteo; limbus paullo concavus 15-18 mm. diametiens, lobis albis vel pallide coeruleis late obovatis apice trilobatis. Capsula globosa calyce brevior.

Plant of 1-3 inches. Flowers white or very pale blue. Open stony pasture-land on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 10,000-11,000 ft. September, 1906. W. Yunnan, China. G. Forrest. 1,805.

Distinct from any other species of the section in its pubescence, the smallness of all the parts, and the relatively large flowers.

Primula (Bullatae) Dubernardiana, G. Forrest. Sp. nov.
Plate xxxiiia.

Rhizoma crassum lignosum apice vestigiis foliorum anni praeteriti dense obtectum. Folia petiolata anguste spathulata in vaginam latam attenuata 5.5-6 cm. longa 8-10 mm. lata integra subtus sparsim farinosa supra glanduloso-pubescentia. Scapus 2-5 cm. altus leviter pubescens umbellam simplicem 3-5-florem gerens; bracteae linearilanceolatae 12-14 mm. longae; pedicelli tenues pubescentes 18-22 mm. longi. Calyx tubuloso-campanulatus basi densissime pubescens 9-10 mm. longus, lobis lanceolatis obtusis ciliatis tubo duplo-longioribus. Corollae pallide roseae tubus anguste infundibuliformis 10 mm. longus fauce luteo vel aurantiaco; limbus 2 cm. diametiens lobis late obcordatis alte emarginatis.

Dry situations on the ledges and in the clefts of cliffs on the eastern flank of the Mekong-Salwin divide, Mekong valley. Lat. 28° 6′ N. Alt. 8,000-9,000 ft. June-July, 1904. S.E. Tibet. G. Forrest. No. 308.

Allied to *P. bracteata*, Franch., and *P. Henrici*, Franch., but is distinct in having non-rugose entire leaves, the calyx deeply lobed, and much larger flowers.

A handsome and peculiar species, with a habit somewhat similar to *P. Forrestii*. The flowers are a beautiful shade of pale rose, the eye bright yellow, the plants generally forming dense cushions of one to two feet in diameter. I only found it in one place on dry shady ledges of inaccessible limestone cliffs; after much labour I secured many specimens, which, unfortunately, were lost later.

Named in honour of the late Père Dubernard, of the French R.C. Mission at Tsekou, in recognition of many services rendered.

Primula (Bullatae) coerulea, G. Forrest. Sp. nov.
Plate xxxiv.

Folia petiolata ovata vel ovato-elliptica basi plus minusve attenuata apice rotundata 4-11 cm. longa 2-4 cm. lata sinuato-crenata ciliata subtus praesertim secus nervos lanata supra bullata glabra vel fere glabra atrovirentia; petiolus 1·5-4 cm. longus lana brunnea vel cinerea dense vestitus. Scapus 3-8 cm. altus plus minusve lanatus uniflorus interdum flores binos gerens; pedicelli 1-3 mm. longi. Calyx late campanulatus 8-14 mm. longus leviter pubescens lobis triangularibus acutis expansis tubum aequantibus vel super-

antibus. Corollae violaceo-coeruleae tubus infundibuliformis 1-1·2 cm. longus calycem paullo superans fauce viridi-luteo ; limbos 2·5-3 cm. diametiens expansus lobis late obovatis integris vel paullo emarginatis.

Plant of 2-3 inches. Flowers rich purplish-blue, eye and tube yellowish-green. Open, exposed situations on rocks in side valleys on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 11,000-12,000 ft. October, 1906. W. Yunnan, China. G. Forrest. No. 1,814.

Is nearest to *P. bullata*, Franch., but differs in the non-ligneous rhizome, in the dense pubescence of the under surface of the larger and broader leaves, the efarinose, pubescent and larger calyx, the larger flowers, and the spreading limb and almost entire lobes of the corolla.

A very rare plant, of which, unfortunately, seed was not procurable. Judging from the situation in which it was found, it must be exceptionally hardy, and with its beautiful, large, blue flowers would prove a valuable addition to the primulas already in cultivation.

Primula (Soldanelloideae) spicata, Franch. Pax, Monog., p. 70.

A slender plant of 4-8 inches. Flowers bright blue, faintly fragrant. Dry, rocky slopes and on ledges of cliffs in side valleys on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 11,000 ft. September-October, 1906. W. Yunnan, China. G. Forrest. No. 1,807.

Another of the many splendid plants discovered by Père Delavay. Of all the primulas there is not one can compare with this small species in airy gracefulness. The scapes are so slender they seem scarcely able to bear the weight of the relatively large flowers, which the slightest current of air sets trembling and swaying. It is a lover of dry, sunny situations, and is not by any means plentiful. It is annual, setting seed very rapidly and withering almost immediately.

Primula (Soldanelloideae) delicata, G. Forrest. Sp. nov.
Plate xxixA.

Folia petiolata oblonga basi plus minusve attenuata 2-4 cm. longa 8-12 mm. lata irregulariter serrata subtus praesertim pubescentia. Scapus gracilis 3-7 cm. altus basi pubescens apice farinosus, spicam unilateralem farinosam gerens ; flores sessiles subpenduli. Calyx campanulatus 4 mm. longus lobis ovatis acutis. Corollae cyaneae tubus calyce brevior ; limbus campanulatus 4-5 mm. diametiens lobis ovatis apice dentatis.

Plant of 1-2 inches. Flowers deep blue. Dry, open situations on the eastern flank of the Tali Range. Lat. 25° 41′ N. Alt. 10,000-11,000 ft. August, 1906. W. Yunnan, China. G. Forrest. No. 1,804.

Allied to *P. spicata*, Franch., but differs in having all the parts smaller, and in the almost tubular corolla.

Primula (Farinosae) farinosa, Linn. Pax, Monog., p. 82.

Boggy ground at the head of the Chien-Chuan valley. Lat. 26° 30′ N. Alt. 8,000 ft. December, 1904. N.W. Yunnan, China. G. Forrest. No. 391.

Plant of 4-12 inches. Flowers pale rose, eye orange. Moist, open situations along the base of the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 8,000-9,000 ft. April-May, 1906. W. Yunnan, China. G. Forrest. No. 1,818.

Plant of 6-9 inches. Flowers pale rose-lilac, eye orange, fragrant. Moist, boggy situations by sides of streams in the Lichiang valley, south of the city. Lat. 26° 50′ N. Alt. 8,200 ft. May, 1906. N.W. Yunnan, China. G. Forrest. No. 2,037.

Margins of streams and boggy places in thickets, north end of the Tsu-hsiong-fu valley. Lat. 25° N. Alt. 7,000 ft. January, 1905. S.W. Yunnan. G. Forrest. No. 307.

Very moist, clayey ground at the south end of the Lang Kong valley. Lat. 26° 12′ N. Alt. 7,000 ft. December, 1904. N.W. Yunnan, China. G. Forrest. No. 305.

Primula (Capitatae) denticulata, Smith. Pax, Monog., p. 90.

Plant of 4-8 inches. Flowers rose-lilac, faintly fragrant. Grassy situations on the margins of cane brakes on the eastern flank of the Lichiang Range. Lat. 27° 12′ N. Alt. 11,000 ft. May, 1906. N.W. Yunnan, China. G. Forrest. No. 2,153.

Plant of 5-9 inches. Flowers lavender-blue, eye yellow, fragrant. Moist, open pasture-land by sides of streams on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 10,000-11,000 ft. April-May, 1906. W. Yunnan, China. G. Forrest. No. 1,801.

Plant of 3-9 inches. Flowers lilac-blue, eye yellow, fragrant. Mountain pasture-land in the Yang-pi valley, on the western flank of the Tali Range. Lat. 25° 20′ N. Alt. 9,000-11,000 ft. April, 1906. W. Yunnan, China. G. Forrest. No. 4,096.

Primula (Soldanelloideae) pinnatifida, Franch. Pax, Monog., p. 66.

Plant of 2-7 inches. Flowers deep rich purplish-blue, fragrant. Moist, grassy situations on mountain slopes on the eastern flank of the Lichiang Range. Lat. 27° 12′ N. Alt. 12,000 ft. June, 1906. N.W. Yunnan, China. G. Forrest. No. 2,398.

Another hardy alpine with beautiful fragrant blue flowers. The species blooms almost immediately on the disappearance of the snow, is local in its distribution, and rather rare.

Primula (Capitatae) nutans, Delavay. Pax, Monog., p. 94.

Ascent from Teng Chuan valley to pass leading to Sung Kwei. In shady pine forests, flowers rich blue. Lat. 26° 12′ N. Alt. 10,000 ft. September, 1904. N.W. Yunnan, China. G. Forrest. No. 72.

Another gem of Delavay's discovering. This is a woodland species, but grows at a good altitude, and once introduced should prove quite hardy.

Primula (Capitatae) capitata, Hook. Pax, Monog., p. 94.

Open marshy places in pine forests on the ascent to the Kari Pass between Pung-tzu-la and Shi-zo. Fragrant. Lat. 28° 12′ N. Alt. 10,000-14,000 ft. September, 1904. N.W. Yunnan, China. G. Forrest. No. 46.

Western slopes of the Kari Pass leading into the Chu-pa valley, between Pung-tzu-la and Shi-zo. Most delicately fragrant. Lat. 28° 12′ N. Alt. 13,000-14,000 ft. September, 1904. N.W. Yunnan, China. G. Forrest. No. 303.

Primula (Capitatae) muscarioides, Hemsl., in Kew Bull. No. 8 (1907), p. 319.

On moist mountain meadows and banks of streams on the Mekong-Salwin divide west of Tsekou mission. Lat. 28° N. Alt. 10,000-11,000 ft. June-August, S.E. Tibet, 1904. G. Forrest. No. 306.

Moist ground, sides of streams, etc., on the Kari Pass, Yangtze-Mekong divide. Lat. 28° 12′ N. Alt. 11,000-12,000 ft. September, 1904. N.W. Yunnan, China. G. Forrest. No. 313.

A delightful new species described in the Kew Bulletin by Mr. Botting Hemsley, from material grown from seed I collected in 1905. The plants do best in moist, shady situations, and grow in profusion in company with *P. sikkimensis* on the banks of mountain streams in S.E. Tibet.

Primula (Capitatae) Littoniana, G. Forrest. Sp. nov. Plates xxxiiiB, xxxv, xxxvi.

Folia late lanceolata basi in petiolum late alatum attenuata apice rotundata 18-20 cm. longa 3·5-7 cm. lata irregulariter dentata utrinque hirsuta. Scapus crassus erectus 40-60 cm. altus vel altior basi glaber sursum farinosus spicam densam elongatam multifloram 7-12 cm. longam 2·5-3·5 cm. latam gerens; flores fragrantes perplurimi sessiles vel brevissime pedicellati reflexi; bracteae lineares farinosæ. Calyx late campanulatus 2-3 mm. longus alte fissus basi farinosus lobis coccineis ovatis vel ovato-lanceolatis acutis. Corollae violaceo-coeruleae tubus 6-7 mm. longus calycem multoties superans; limbus concavus 6-8 mm. diametiens alte fissus lobis anguste ovatis integris apice rotundatis. Capsula parva globosa calycem non superans.

Open mountain meadows on the range forming the eastern boundary of the Lichiang valley. Lat. 27° 12′ N. Alt. 10,000-11,000 ft. August, 1906. N.W. Yunnan, China. G. Forrest. No. 2,655.

Named to commemorate the late Consul Litton of Tengyveh, to whom I was much indebted for valuable assistance during my stay in China.

Primula (Tenellae) bella, Franch. Pax, Monog., p. 97.

Erect plant of 1-1¼ inches. Flowers rose-lavender, faintly fragrant. Damp, sandy mountain pasture-land on the Mekong-Salwin divide. Lat. 27° 28′ N. Alt. 14,000-15,000 ft. July-August, 1905. G. Forrest. No. 480.

Plant of 1½-2 inches. Flowers deep bluish-rose, eye white. On exposed rocks and ledges of cliffs near the summit of the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 12,000-13,000 ft. August, 1906. W. Yunnan, China. G. Forrest. 1,813.

Plant of 1-2½ inches. Flowers pale rose, eye greenish-white, faintly fragrant. Dry, shady situations on cliffs in side valleys on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 9,000-10,000 ft. September, 1906. G. Forrest. No. 1,803.

Plant of one inch. Flowers deep, rich purplish-blue. On a patch of peaty soil on a barren limestone ridge at the extreme limit of vegetation on the eastern flank of the Lichiang Range. Lat. 27° 30′ N. Alt. 16,000 ft. June, 1906. N.W. Yunnan, China. G. Forrest. No. 2,399.

Primula (Tenellae) yunnanensis, Franch. Pax, Monog., p. 97.

Plant of 2-3 inches. Flowers rose-pink, faintly fragrant. Dry, open situations on bare slopes on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 11,000-12,000 ft. September, 1906. W. Yunnan, China. G. Forrest. No. 1,817.

Plant of 2-4 inches. Flowers rose-red, fragrant. In crevices of dry, shady rocks and cliffs on the eastern flank of the Lichiang Range. Lat. 27° 10′ N. Alt. 10,500-12,000 ft. May, 1906. N.W. Yunnan, China. G. Forrest. No. 2,059.

Primula (Tenellae) congestifolia, G. Forrest. Sp. nov.
Plate xxviiiA.

Perennis. Rhizoma vestigiis foliorum anni praeteriti obtectum. Folia petiolata late ovata 7-9 mm. longa 5-6 mm. lata in petiolum 1 cm. longum late alatum attenuata revoluta crenata subtus dense farinosa supra vix pubescentia. Scapus crassus 2-2·5 cm. altus puberulus 1-3-florus; flores sessiles vel brevissime pedicillati pedicillis 1-2 mm. longis farinosis paullo deflexis; bracteae ovato-lanceolatae 5-6 mm. longae acutae brunneo-virides glabrae intus sparsim farinosæ. Calyx poculiformis 7 mm. longus alte fissus lobis ovatis obtusis. Corollae roseae tubus anguste infundibuliformis calycem vix superans fauce annulato; limbus 1-3·2 cm. diametiens paullo patens lobis ovatis bilobatis.

Plant of 1-2½ inches. Flowers bright rose-red, non-fragrant. On open, wind-swept limestone ridges on the Mekong-Salwin divide. Lat. 27°-28° N. Alt. 13,000-15,000 ft. July-August, 1905. S.E. Tibet. G. Forrest. No. 478.

A beautiful dwarf perennial with brilliantly-coloured flowers, and one of the hardiest species seen. Growing to perfection in the most exposed situations. Rare and local.

Primula (Tenellae) longituba, G. Forrest. Sp. nov.
Plate xxxvii.

Perennis parva glabra. Folia ovata vel late obovata 2·5-4 cm. longa 1-2·2 cm. lata in petiolum alatum attenuata biserrata subtus

dense supra sparsim farinosa. Scapus tenuis 1·5-4 cm. altus farinosus umbellam simplicem 1-5-floram gerens; bracteae linearilanceolatae; pedicelli 2-8 mm. longi farinosi bracteolas paucas gerentes. Calyx campanulatus 3-5 mm. longus dense farinosus alte fissus lobis lanceolatis acutis. Corollae tubus flavido-viridis anguste infundibuliformis 1-1·4 cm. longus calycem multoties superans; limbus coeruleo-roseus paullo concavus 14-16 mm. diametiens lobis obovatis paullo emarginatis. Capsula ovoidea parva calycem paullo superans.

Plant of $1\frac{1}{2}$-$2\frac{1}{2}$ inches. Flowers bluish-rose, eye and tube green, fragrant. Moist, shady situations on moss-covered rocks and cliffs in side valleys on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 10,000-11,000 ft. August-September, 1906. W. Yunnan, China. G. Forrest. No. 1,809.

Allied to *P. yunnanensis*, Franch., but differing in the broader and densely farinose leaves, the farinose scape and inflorescence, in the short bracteoles, and much shorter pedicels, the smaller and more numerous flowers, and the slightly emarginate lobes of the corolla.

Primula (Nivales) sikkimensis, Hook. Pax, Monog., p. 100.

Mekong-Salwin divide to the west of Tsekou mission. Lat. 28° 10′ N. Alt. 10,000-11,000 ft. S.E. Tibet, July, 1904. G. Forrest. No. 400.

Plant of 12-18 inches. Flowers bright canary-yellow, fragrant. Crevices and ledges of limestone cliffs on the eastern flank of the Lichiang Range. Lat. 27° 20′ N. Alt. 11,000-12,000 ft. July, 1906. N.W. Yunnan, China. G. Forrest. No. 2,642.

Primula (Nivales) nivalis, Pallas,
var. **macrophylla** (Don) Pax, Monog., p. 103.

Plant of 4-9 inches. Corolla deep rose-lavender, eye and tube green, thick and fleshy; fragrant. Moist, open situations on mountain meadows on the summit of the Tali Range. Lat. 25° 40′ N. Alt. 12,000-13,000 ft. September-October, 1906. W. Yunnan, China. G. Forrest. No. 1,820.

var. **sinensis,** Pax, Monog., p. 104.

Plant of 6-12 inches. Flowers deep rose-lavender, eye greenish-lavender, fragrant. Moist mountain pasture-land on the eastern

flank of the Lichiang Range. Flowering successively, always near the snow-line. Lat. 27° 12′ N. Alt. 10,000-13,000 ft. May, 1906. N.W. Yunnan, China. G. Forrest. No. 2,128.

Plant of 12-24 inches. Flowers rich purplish-crimson. Forming masses in open pasture-land on the eastern flank of the Lichiang Range. Lat. 27° 20′ N. Alt. 11,000-12,000 ft. May, 1906. N.W. Yunnan, China. G. Forrest. No. 2,254.

Primula (Nivales) pulchella, Franch. Pax, Monog., p. 104.

Plant of 4-7 inches. Flowers semi-pendulous, purplish-blue, fragrant. Shady, grassy situations in pine forests at the base of the eastern flank of the Lichiang Range. Lat. 27° 20′ N. Alt. 10,000 ft. June, 1906. N.W. Yunnan, China. G. Forrest. No. 2,480.

Primula (Omphalogramma) Franchetii, Pax, Monog., p. 108.

Moist rocky situations on mountain meadows on the Mekong-Salwin divide to the N.W. of Tsekou mission. Lat. 28° 12′ N. Alt. 10,000-12,000 ft. S.E. Tibet. July-August, 1904. G. Forrest. No. 685.

Primula (Omphalogramma) vincaeflora, Franch. Pax, Monog., p. 108. Plate XXXA.

Plant of 16-14 inches. Flowers deep indigo blue, non-fragrant. Moist, shady situations on grassy openings in pine forests on the eastern flank of the Lichiang Range. Lat. 27° 12′ N. Alt. 10,000-11,000 ft. June, 1906. N.W. Yunnan, China. G. Forrest. No. 2,234.

Primula (Omphalogramma) Delavayi, Franch. Pax, Monog., p. 110.

Plant of 3-6 inches. Flowers, tube yellowish at base, limb deep rose-purple. Moist, open mountain meadows on the summit of the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 12,000-13,000 ft. September, 1906. W. Yunnan, China. G. Forrest. No. 4,097.

Primula (Callianthae) Forrestii, Balf. fil. Sp. nov. Plates XXXVIII, XXXIXB.

Rhizoma crassum lignosum 20-80 cm. longum basi nudum sursum vestigiis foliorum anni praeteriti obtectum. Fragrans ;

praeter corollam dense glanduloso-pubescens. Folia petiolata ovato-elliptica basi subcordata vel attenuata irregulariter bicrenata subtus dense farinosa supra rugosa, infima rosulata reflexa 3-4 cm. longa 1·5-3 cm. lata cum petiolo 2-3 cm. longo expanso subvaginato et farinoso, superiora erecta expansa 9-20 cm. longa 3·5-6 cm. lata cum petiolo 4-10 cm. longo basi expanso. Scapus validus erectus 8-23 cm. longus folia aequans vel superans umbellam 10-25-floram gerens; bracteae foliaceae late lanceolatae 1-3 cm. longae 7-10 mm. latae integrae; pedicelli erecti tenues 1-4 cm. longi. Calyx poculiformis vel paullo campanulatus 10-15 mm. longus per trientem fissus lobis late ovatis apice rotundatis. Corollae tubus pallide aurantiaco-luteus basi cylindricus sursum infundibuliformis 14 mm. longus fauce intense aurantiaco; limbus 2 cm. diametiens lobis aurantiaco-luteis late ovatis vel rotundatis alte emarginatis. Capsula ovoidea calyce multo minor et eodem inclusa.

Plant of 6 inches to 3 feet. Rootstock woody. Flowers deep yellow with an orange eye; flowers and foliage fragrant. Pendulous from dry, shady crevices of limestone cliffs on the eastern flank of the Lichiang Range. Lat. 27° 12′ N. Alt. 9,000-11,000 ft. May, 1906. N.W. Yunnan, China. G. Forrest. No. 2,117.

Primula (Callianthae) vittata, Bureau et Franch. Pax, Monog., p. 118.

Plant of 6-12 inches. Flowers deep rose-red. Forming masses on steep, grassy slopes on the eastern flank of the Lichiang Range. Lat. 27° 12′ N. Alt. 11,000-12,000 ft. May, 1906. N.W. Yunnan, China. G. Forrest. No. 2,283.

Primula (Callianthae) amethystina, Franch. Pax, Monog., p. 118.

Plant of 3-6 inches. Flowers deep purplish-blue, fragrant. Moist, open mountain meadows near, and on the summit of, the Tali Range. Lat. 25° 40′ N. Alt. 12,000-13,000 ft. September-October, 1906. W. Yunnan, China. G. Forrest. No. 1,806.

Primula (Callianthae) brevifolia, G. Forrest. Sp. nov. Plate xl.

Glabra efarinosa. Folia papyracea latissime ovato-elliptica in petiolum brevem alatum attenuata 2·5-5 cm. longa 1·5-2·5 cm. lata serrata. Scapus gracilis 8-19 cm. altus folia multoties superans umbellam subpendulam unilateralem 4-12-floram gerens; flos

fragrans; bracteae parvae late lanceolatae acutae; pedicelli 5-14 cm. longi. Calyx purpureo-viridis 5 mm. longus ad medium fere fissus lobis late lanceolatis acutis. Corollae cyaneae late infundibuliformis tubus calycem aequans vel superans; limbus 7-10 mm. diametiens lobis brevibus latis alte et irregulariter emarginatis.

Erect plant of 3-7 inches. Flowers semi-pendulous, deep blue, faintly fragrant. On open, damp mountain pasture-land on the Mekong-Salwin divide. Lat. 27°-28° N. Alt. 14,500-16,000 ft. July-August, 1905. S.E. Tibet. G. Forrest. No. 476.

Allied to *P. amethystina*, Franch., but differing in being taller and more delicate, in the form and incision of the leaves, the more numerous flowers, and the narrower and irregularly-lobed corolla.

Primula (Callianthae) biserrata, G. Forrest. Sp. nov. Plate xli.

Glabra. Folia membranacea oblanceolata in petiolum scariose alatum attenuata 12-20 cm. longa 2·5-5 cm. lata irregulariter biserrata. Scapus 20-29 cm. altus folia superans umbellam simplicem vel umbellas duas superpositas semipendulas 5-12-floras gerens; flos fragrans; bracteae lanceolatae acutae vel fissae 5-11 mm. longae; pedicelli 1-2·5 cm. longi. Calyx late campanulatus 7-10 mm. longus ad medium fere fissus lobis late lanceolatis apice plus minusve fissis. Corollae tubus e basi ampliatus fauce aurantiaco annulato; limbus 2-2·5 cm. diametiens alte fissus lobis sulphureis macula aurantiaca centrali notatis rotundatis obscure emarginatis margine irregularibus.

Plant of 7-14 inches. Flowers pale yellow, with the centre of each petal marked orange; faintly fragrant. Open situations on the margins of pine forests on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 11,000-12,000 ft. July-August, 1906. W. Yunnan, China. G. Forrest. No. 1,816.

Plant of 9-15 inches. Flowers yellow, with an orange stripe down centre of each segment of corolla; fragrant. Open mountain meadows on the eastern flank of the Lichiang Range. Lat. 27° 15′ N. Alt. 11,000-13,000 ft. September, 1906. N.W. Yunnan, China. G. Forrest. No. 2,974.

Mekong-Salwin divide to the N.W. of Tsekou mission. Lat. 28° 12′ N. Alt. 10,000-11,000 ft. June-July, 1904. S.E. Tibet. G. Forrest. No. 4,100.

Allied to *P. obtusifolia*, Royle, but differing in the entirely glabrous leaves, the long lanceolate bracts, the divided apices of

these and the lobes of the calyx, in having occasionally two umbels, in the larger number and semi-pendulous habit of the flowers, the gradual expansion of the corolla tube, the yellow colour of the corolla, and the irregular margins of the lobes.

A hardy and graceful alpine, with large flowers beautifully shaded from pale sulphur to orange yellow. It is a lover of shady pine forests at the highest altitudes, on the margins of which it forms scattered colonies. Soil free and stony, but not moist.

Primula (Cankrienia) Poissonii, Franch. Pax, Monog., p. 128.

In moist places, generally bog, in the Lichiang and Hoching valleys. Plant of 1-2½ ft. Flowers deep rose. Lat. 26°-27° 30′ N. Alt. 7,000-9,000 ft. September, 1904. N.W. Yunnan, China. G. Forrest. No. 355.

Plant of 1-2 ft. Flowers deep purplish-crimson, eye orange, faintly fragrant. Open, boggy meadows on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 10,000-12,000 ft. August, 1906. W. Yunnan, China. G. Forrest. No. 1,819.

Erect plant of 1-3 ft. Flowers rich crimson-lake, eye orange. In drying the colour changes to pale magenta. Moist and boggy situations at the north end of the Lichiang valley. Lat. 27° 10′ N. Alt. 8,000-9,000 ft. May, 1906. N.W. Yunnan, China. G. Forrest. No. 2,120.

Primula (Cankrienia) Bulleyana, G. Forrest. Sp. nov.
Plates xxxixA, xlii.

Folia papyracea ovato-lanceolata apice rotundata vel acuta, in petiolum breviter alatum attenuata 12-17 cm. longa 3-4 cm. lata argute et irregulariter dentata subtus leviter hispida supra glabra Scapus elatus validus 40-70 cm. altus versus apicem farinosus umbellas 5-7 superpositas 15-17-floras inter se post anthesin 8-11 cm. distantes gerens; flos fragrans; bracteae lineares 1·5-3 cm. longae juveniles sparsim farinosæ; pedicelli validi mox cernui post anthesin erecti sparsim farinosi bracteas aequantes vel eisdem breviores. Calyx campanulatus sub fructu poculiformis 4-5 mm. longus ad medium usque fissus lobis late triangularibus sursum subulatis extus pallide viridibus lineis albidis intersepalinis striatis intus farinosis Corollae tubus cylindricus sursum infundibuliformis fauce annulato; limbus 2 cm. diametiens lobis intense aurantiaco-luteis extus rubro-fuscis late obovatis fere rotundatis. Capsula ovoidea calycem paullo superans.

Plant of 1½-2½ ft. Flowers deep reddish-orange, in bud deep brownish-crimson, faintly fragrant. Moist, open situations on mountain meadows on the eastern flank of the Lichiang Range. Lat. 27° 25′ N. Alt. 10,000-11,000 ft. June, 1906. N.W. Yunnan, China. G. Forrest. No. 2,440.

Named in honour of Mr. A. K. Bulley of Ness, Neston, Cheshire, for whom I collected.

Primula (Cankrienia) serratifolia, Franch. Pax, Monog., p. 126.

Plant of 1-2 ft. Flowers rich pale rose, crushed strawberry shade. Moist, open situations on mountain meadows on the eastern flank of the Lichiang Range. Lat. 27° 25′ N. Alt. 10,000-11,000 ft. June, 1906. N. W. Yunnan, China. G. Forrest. No. 2,449.

Plant of 1-2 ft. Flowers rose-carmine with yellow eye, fragrant. Moist, open situations by the sides of ditches and streams on plain at north end of the Lichiang valley. Lat. 27° 10′ N. Alt. 9,000 ft. May, 1906. N. W. Yunnan, China. G. Forrest. No. 2,194.

My specimens differ slightly from the above in having the bracts as long or longer than the pedicels, 2-3 cm. long, and the flowers and calyces smaller. Also in No. 2,194 the upper part of the scape, the bracts, and the pedicels are farinose in the young state.

ANDROSACE.

Androsace (Pseudoprimula) alchemilloides, Franch. Pax, Monog., p. 180.

Plant of 1-2½ inches. Flowers pure white, fragrant. Ledges of limestone cliffs and on humus-covered boulders on the eastern flank of the Lichiang Range. Lat. 27° 12′ N. Alt. 11,000-12,000 ft. June, 1906. N.W. Yunnan, China. G. Forrest. No. 2,228.

Androsace (Chamaejasme) spinulifera, Franch. Pax, Monog., p. 184. Plate xliiiB.

Erect plant of 3-10 inches. Flowers rose-pink, eye yellow. Very dry, barren, stony grassland at the north end of the Lichiang plain. Lat. 27° 5′ N. Alt. 8,500 ft. May, 1906. N. W. Yunnan, China. G. Forrest. No. 2,081.

Androsace (Chamaejasme), Bulleyana, G. Forrest. Sp. nov. Plate xliiiA.

Biennis radice crassa lignosa multicipite. Folia dense rosulata spathulata 12-30 mm. longa 4-7 mm. lata sessilia mucronata coriacea glauca margine cartilaginea ciliata. Scapi numerosi erecti validi 5-12 cm. alti pubescentes eorum quisque umbellam 5-12-floram dense pubescentem gerens; bracteae lanceolatae acutae 4-7 mm. longae; pedicelli plus minusve inaequales 8-22 mm. longi. Calyx turbinatus vel paullo campanulatus 3-4 mm. longus ad medium fissus lobis ovato-lanceolatis obtusis. Corollae miniatae hypocrateriformis tubus calycem aequans fauce prominenter annulato; limbus 6-10 mm. diametiens lobis late obovatis integris. Capsula ovoidea.

Dry, rocky hillsides on the descent from the Chung Tien plateau to the Yangtze valley near Tang Tui. Flowers bright vermillion. Lat. 28° 12′ N. Alt. 10,000 ft. September, 1906. N.W. Yunnan, China. G. Forrest. No. 108.

Allied to *A. Aizoon*, Duby, var. *coccinea*, Franch., but differing in the pubescence of all the parts, the larger leaves and corolla limb, the prominent annulus, and the 5-fid capsule.

Androsace (Chamaejasme) mucronifolia, Watt. Pax, Monog., p. 188.

Plant of 6-15 inches. Flowers rose-pink. Forming dense masses in dry, exposed situations on the ledges of cliffs and on limestone drift on the eastern flank of the Lichiang Range. Lat. 27° 12′ N. Alt. 9,500-11,000 ft. May, 1906. N.W. Yunnan, China. G. Forrest. No. 2,127.

Androsace (Chamaejasme) Chamaejasme, Host. Pax, Monog., p. 188.

Tufted plant of 2-4 inches. Flowers pale rose, eye a deeper shade. Dry, exposed situations amongst rocks on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 11,000-12,000 ft. July, 1906. W. Yunnan, China. G. Forrest. No. 1,810.

Plant of 1-2 inches. Flowers bright rose-red. Forming dense masses in stony, sandy, moist situations on the slopes of the Mekong-Salwin divide. Lat. 27°-28° N. Alt. 11,000-13,000 ft. July-August, 1905. S.E. Tibet. G. Forrest. No. 477.

Androsace (Aretia) Delavayi, Franch. Pax, Monog., p. 201.

Plant of one inch. Flowers pale rose, occasionally white, eye yellow. Forming dense cushions on humus-covered boulders at the edge of the snow-line on the eastern flank of the Lichiang Range. Lat. 27° 12′ N. Alt. 12,000-13,000 ft. June, 1906. N.W. Yunnan, China. G. Forrest. No. 2,319.

Androsace (Andraspis) erecta, Maxim. Pax, Monog., p. 209.

Dry, rocky hillsides on the descent from the Chung Tien plateau to the Yangtze valley, near Tang Tui. Flowers rosy white. Lat. 28° 12′ N. Alt. 10,000 ft. September, 1904. N.W. Yunnan, China. G. Forrest. No. 121.

Plant of 6-9 inches. Flowers white or pink. Dry, barren, rocky pasture-land at the base of the eastern flank of the Lichiang Range. Lat. 27° 10′ N. Alt. 8,500-9,000 ft. August, 1906. N.W. Yunnan, China. G. Forrest. No. 2,738.

LYSIMACHIA.

Lysimachia (Nummularia) Hemsleyana, Maxim. Pax, Monog., p. 259.

Moist ground by the sides of padi fields, etc., in the Teng Chuan and Hoching valleys. Lat. 26°-26° 30′ N. Alt. 7,000-8,500 ft. N.W. Yunnan, China. G. Forrest. No. 82.

Slender plant of 9-12 inches. Flowers yellow. Dry, open situations amongst grass in side valleys on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 10,000-11,000 ft. W. Yunnan, China. G. Forrest. No. 3,842.

Lysimachia (Lerouxia) deltoidea, Wight, var. **cinerascens,** Franch. Pax, Monog., p. 263.

Plant of 2-4 inches. Flowers yellow. Open, dry, rocky situations amongst scrub on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 9,000-10,000 ft. July, 1906. W. Yunnan, China. G. Forrest. No. 3,843.

Plant of 2-6 inches. Flowers canary yellow. Dry, stony, open situations amongst dwarf scrub on the eastern flank of the Lichiang Range. Lat. 27° 10′ N. Alt. 10,000 ft. June, 1906. N.W. Yunnan, China. G. Forrest. No. 2,265.

Lysimachia (Lerouxia) drymariaefolia, Franch. Pax, Monog., p. 264.

Semi-prostrate plant of 1-1½ ft. Flowers yellow. Shady, grassy situations in and on the margins of pine forests on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 11,000-12,000 ft. August-September, 1906. W. Yunnan, China. G. Forrest. No. 3,841.

Lysimachia (Ephemerum) bracteata, G. Forrest. Sp. nov.

Planta tota pubescens procumbens vel erecta 30-40 cm. alta stolones breves emittens. Folia omnia opposita petiolata late lanceolata obtusa 9-11·5 cm. longa 3-4 cm. lata in petiolum 2-2·5 cm. longum attenuata integra. Racemus laxus subpendulus bracteatus; bracteae foliaceae lanceolatae 2-3 cm. longae 5-10 mm. latae; pedicelli 2-3 cm. longi. Calyx 6-8 mm. longus ad basin usque fissus lobis anguste lanceolatis dense pubescentibus. Corolla flava late companulata 1 cm. longa intus glandulosa alte lobata lobis late ovatis obtusis vel subacutis. Stamina corolla breviora filamentis basi connatis. Ovarium pilosum stylo corollam aequante staminibus longiore.

Plant of 1-3 ft. Shady thickets on hills to the west of Yunnan-fu. Lat. 25° N. Alt. 7,000-8,000 ft. February, 1905. S.E. Yunnan, China. G. Forrest. No. 571.

Resembles in some parts *L. Franchetii*, R. Knuth, but is excluded from the section to which that species belongs by its loosely racemose inflorescence, yet is quite distinct in the section Ephemerum.

Lysimachia (Ephemerum) barystachys, Bunge. Pax, Monog., p. 289.

Plant of 12-16 inches. Flowers white, anthers violet. Dry, barren, stony ground at the base of the eastern flank of the Lichiang Range. Lat. 27° 10′ N. Alt. 8,500-9,000 ft. July, 1906. N.W. Yunnan, China. G. Forrest. No. 2,515.

Lysimachia (Ephemerum) lobelioides, Wall. Pax, Monog., p. 296.

Plant of 6-10 inches. Flowers white. Open, moist, grassy situations along the base of the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 7,000-9,000 ft. May, 1906. W. Yunnan, China. G. Forrest. No. 3,838.

Lysimachia (Ephemerum) Delavayi, Franch. Pax, Monog., p. 297.

Plant of 1-3 ft. Flowers pinkish-white, anthers violet. Dry, open situations in side valleys on the eastern flank of the Tali Range, Lat. 25° 40′ N. Alt. 9,000-10,000 ft. August-September, 1906. W. Yunnan, China. G. Forrest. No. 4,120.

Lysimachia (Ephemerum) violascens, Franch. Pax, Monog. p. 297.

Dry limestone hillside on ascent of pass between Teng Chuan and Sung Kwei valleys. Flowers pinkish. Lat. 26° N. Alt. 8,000-10,000 ft. September, 1904. N.W. Yunnan, China. G. Forrest. No. 447.

Plant of 2-4 ft. Flowers white or shell-pink, anthers violet. Dry, open situations amongst scrub on the eastern flank of the Tali Range. Lat. 25° 40′ N. Alt. 10,000-11,000 ft. September-October, 1906. W. Yunnan, China. G. Forrest. No. 3,839.

Lysimachia (Ephemerum) candida, Lindl.,
sub-spec. **eucandida,** R. Knuth. Pax, Monog., p. 300.

Common amongst opium crop. Hong Ai valley. Lat. 25° 30′ N. Alt. 5,000-6,000 ft. S.W. Yunnan, China. G. Forrest. No. 456.

sub-spec. **microphylla,** Franch. Pax, Monog., p. 301.

Plant of 4-6 inches. Flowers white. Marshy situations on the bunds of padi-fields in the Yung Chang valley. Lat. 25° 6′ N. Alt. 5,500 ft. April, 1906. W. Yunnan, China. G. Forrest. No. 4,103.

Plant of 6-8 inches. Flowers white, anthers violet. Marshy, open situations by sides of streams in the Yang-pi valley. Lat. 26° 30′ N. Alt. 5,000 ft. May, 1906. W. Yunnan, China. G. Forrest. No. 4,104.

Plant of 6-10 inches. Flowers white. Damp, grassy situations in the padi fields around the city of Talifu. Lat. 25° 40′ N. Alt. 6,500 ft. April-May, 1906. W. Yunnan, China. G. Forrest. No. 3,840.

Lysimachia (Ephemerum) longisepala, G. Forrest. Sp. nov.

Planta tota pube densa breveque fumosa vestita. Caulis erectus 30 cm. altus. Folia omnia opposita lanceolata 3-5 cm. longa 8-13 mm. lata subacuta integra subtus cinerea supra viridia, superiora in petiolum brevem attenuata, inferiora sessilia et semiamplexicaulia. Racemus bracteatus brevis 6-7 cm. longus; bractae lanceolatae acutae pedicellos floresque aequantes vel superantes; pedicelli tenues erecti 8-16 mm. longi. Calyx 8 mm. longus ad basin usque fissus lobis anguste lanceolatis acutis dense pubescentibus glandulosisque. Corolla aurantiaca late campanulata alte lobata lobis late ovatis obtusis integris glandulosis. Stamina inaequalia corolla paullo breviora; filamentis ultra medium connatis tubum dense glandulosum formantibus. Stylus stamina paullo superans. Capsula globosa calyce multo brevior.

Boggy ground, such as the sides of padi-fields, etc., in the Sung Kwei valley. Lat. 26° 5′ N. Alt. 8,000 ft. September, 1904. N.W. Yunnan, China. G. Forrest. No. 426.

A distinct species resembling none of the species in the section to which it belongs.

Lysimachia (Ephemerum) lichiangensis, G. Forrest. Sp. nov.

Planta glabra erecta 35-50 cm. alta subsimplex vel et basi ramosa caulibus obscure striatis. Folia papyracea alterna lanceolata acuminata 3-5 cm. longa 6-14 mm. lata basi anguste attenuata, paullo amplexicaulia et decurrentia supra atrovirentia subtus pallidiora utrinque glandulis rubris praesertim marginibus crispatis incrassatisque punctata et vittata. Racemus bracteatus simplex vel ramosus flores carneo-albos venulis roseis striatos sub antheis suberectos post anthesin erectos gerens; bracteae lineari-lanceolatae pedicellos superantes; pedicelli 4-5 mm. longi. Calyx corollam fere aequans ad basin usque fissus lobis albis anguste lanceolatis acuminatis apice paullo recurvis lineis duabus longitudinalibus rubro glandulosis notatis margine membranaceis. Corolla late campanulata 6-8 mm. longa alte lobata tubo intus dense glanduloso lobis late spathulatis apice rotundatis integris. Stamina paullo exserta basin loborum corollae affixa filamentis versus basin glandulosis; antheris sparsim glandulosis. Stylus glaber staminibus brevior. Capsula globosa glabra calycem aequans vel eodem paullo brevior.

Plant of 1-2 ft. Flowers pinkish-white. Shady, rocky situations at the base of cliffs on the eastern flank of the Lichiang Range. Lat. 27° 12′ N. Alt. 9,000-10,000 ft. June, 1906. N.W. Yunnan, China. G. Forrest. No. 2,352.

Allied to *L. decurrens*, Forst., var. *platypetala*, Franch., but differing in the height, the smaller and glandular leaves, shorter petioles and pedicels, the colour of the flower, and the short style.

Lysimachia (Ephemerum) humifusa, R. Knuth.

Prostrate plant of 4-8 inches. Flowers red or pink. Dry, open, grassy situations amongst scrub on the eastern flank of the Lichiang Range. Lat. 27° 10′ N. Alt. 9,000-10,000 ft. May, 1906. N.W. Yunnan, China. G. Forrest. No. 2,068.

LIST OF PLATES

Illustrating Mr. George Forrest's Paper on Primulacae from Western Yunnan and Eastern Tibet.

Unless when otherwise stated, the plates are taken from photographs by Mr. R. Adam of dried specimens in the Herbarium of the Royal Botanic Garden, Edinburgh.

PLATE XXVI. Primula langkongensis, G. Forrest. Sp. nov.

XXVII. Primula cortusoides, Linn., var. lichiangensis, G. Forrest. Var. nov.

XXVIIIA. Primula congestifolia, G. Forrest. Sp. nov.

XXVIIIB. Primula malacoides, Franch. Photograph by Mr. R. Adam of a plant in the Royal Botanic Garden, Edinburgh, presented by A. K. Bulley, Esq., of Ness, Neston, Cheshire.

XXIXA. Primula minutiflora, G. Forrest. Sp. nov.

XXIXB. Primula delicata, G. Forrest. Sp. nov.

XXXA. Primula vincaeflora, Franch. Plant in natural habitat. Photograph by G. Forrest.

XXXB. Primula gratissima, G. Forrest. Sp. nov. Plant in natural habitat. Photograph by G. Forrest.

XXXI. Primula gratissima, G. Forrest. Sp. nov.

XXXII. Primula taliensis, G. Forrest. Sp. nov.

XXXIIIA. Primula Dubernardiana, G. Forrest. Sp. nov.

XXXIIIB. Primula Littoniana, G. Forrest. Sp. nov. Flower spike. Photographed in natural habitat by G. Forrest.

XXXIV. Primula coerulea, G. Forrest. Sp. nov.

XXXV. Primula Littoniana, G. Forrest. Sp. nov.

XXXVI. Primula Littoniana, G. Forrest. Sp. nov. Plant in natural habitat. Photograph by G. Forrest.

XXXVII. Primula longituba, G. Forrest. Sp. nov.

XXXVIII. Primula Forrestii, G. Forrest. Sp. nov.

XXXIXA. Primula Bulleyana, G. Forrest. Sp. nov. Plant in natural habitat. Photograph by G. Forrest.

XXXIXB. Primula Forrestii, Balf. fil. Sp. nov. Plant in natural habitat. Photograph by G. Forrest.

XL. Primula brevifolia, G. Forrest. Sp. nov.

XLI. Primula biserrata, G. Forrest. Sp. nov.

XLII. Primula Bulleyana, G. Forrest. Sp. nov.

XLIIIA. Androsace Bulleyana, G. Forrest. Sp. nov. Photograph by Mr. R. Adam of a plant in the Royal Botanic Garden, Edinburgh, presented by A. K. Bulley, Esq., of Ness, Neston, Cheshire.

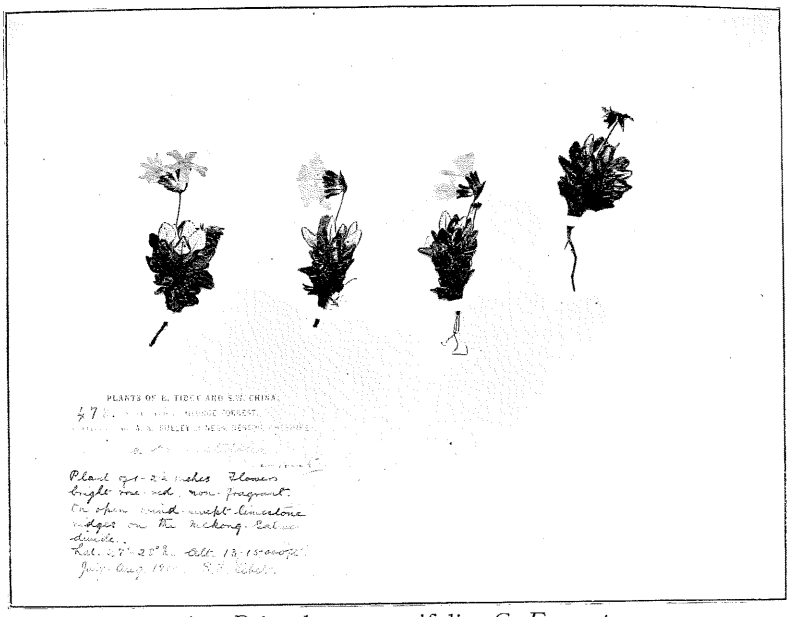
XLIIIB. Androsace spinulifera, Franch. Plant in natural habitat. Photograph by G. Forrest.



a Primula langkongensis, *G. Forrest.*



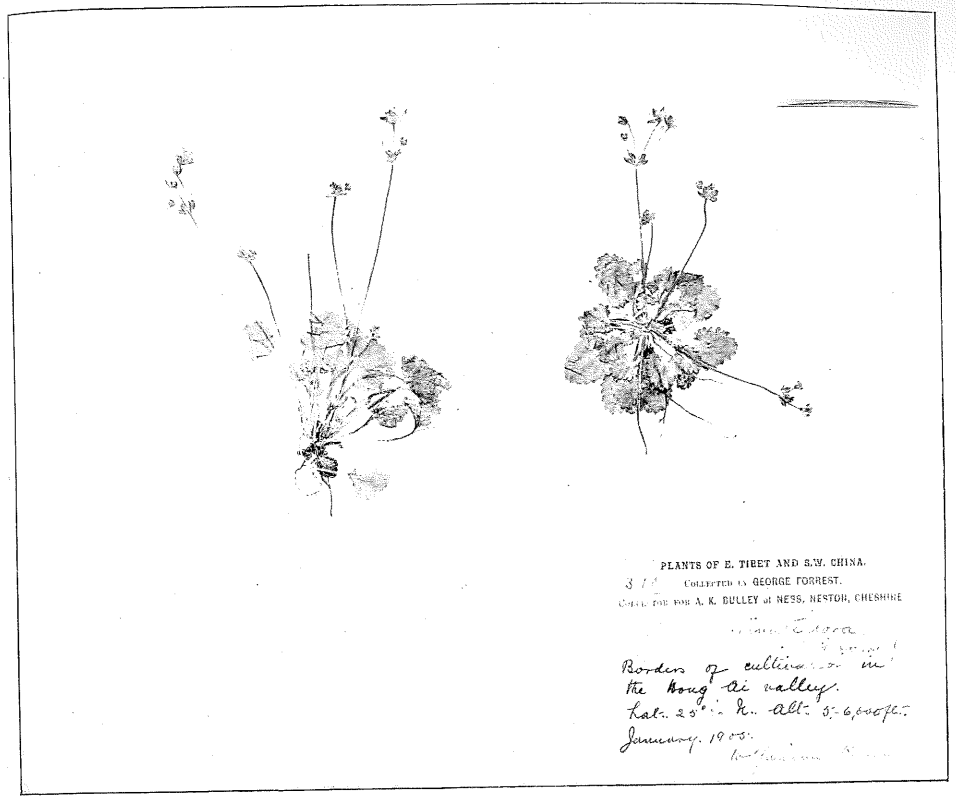
Primula cortusoides, Linn., var. lichiangensis, *G. Forrest.*



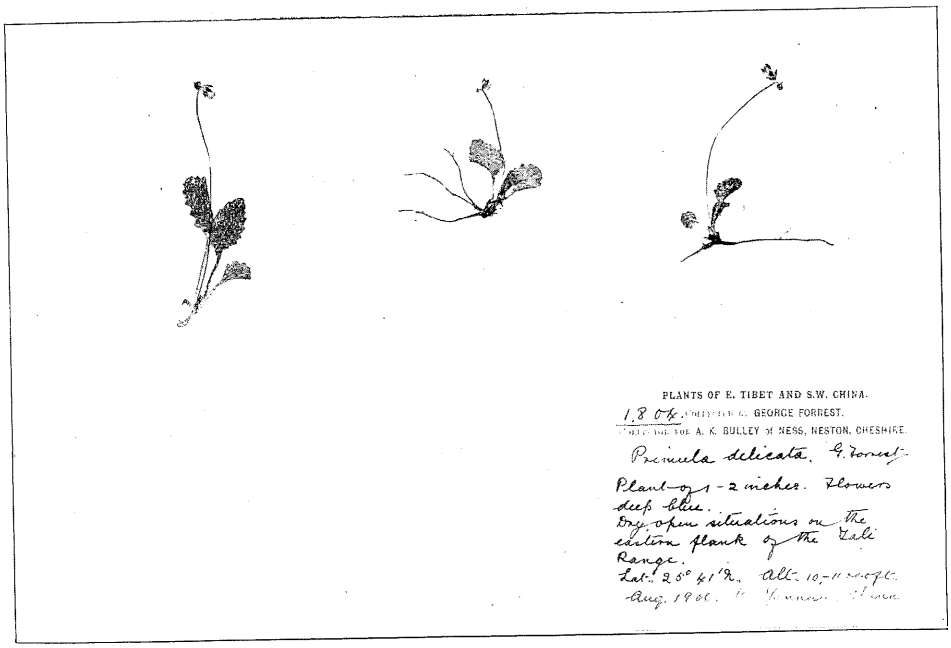
A.—Primula congestifolia, *G. Forrest.*



B.—Primula malacoides, *Franch.*



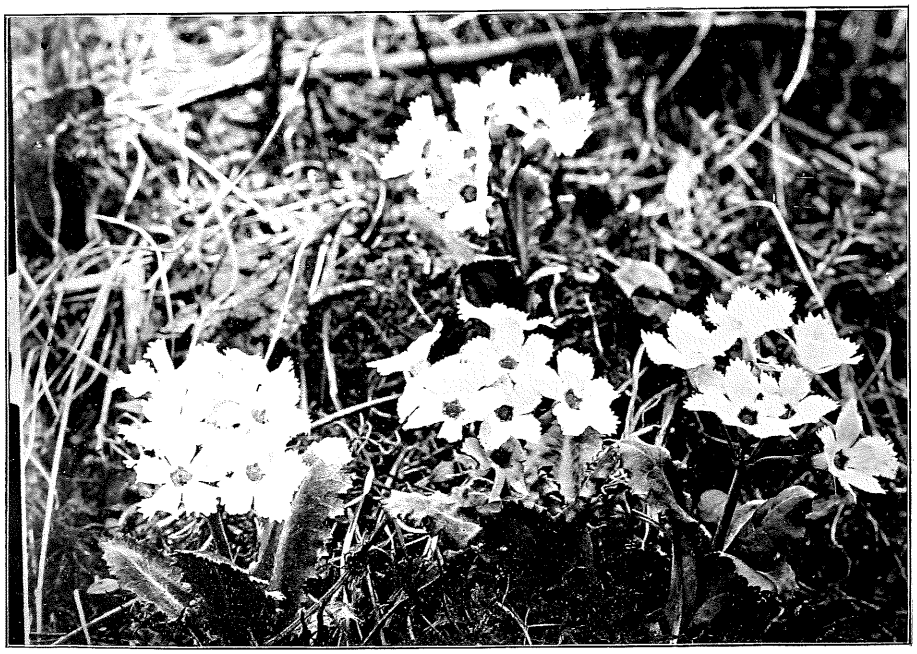
A.—Primula minutiflora, *G. Forrest.*



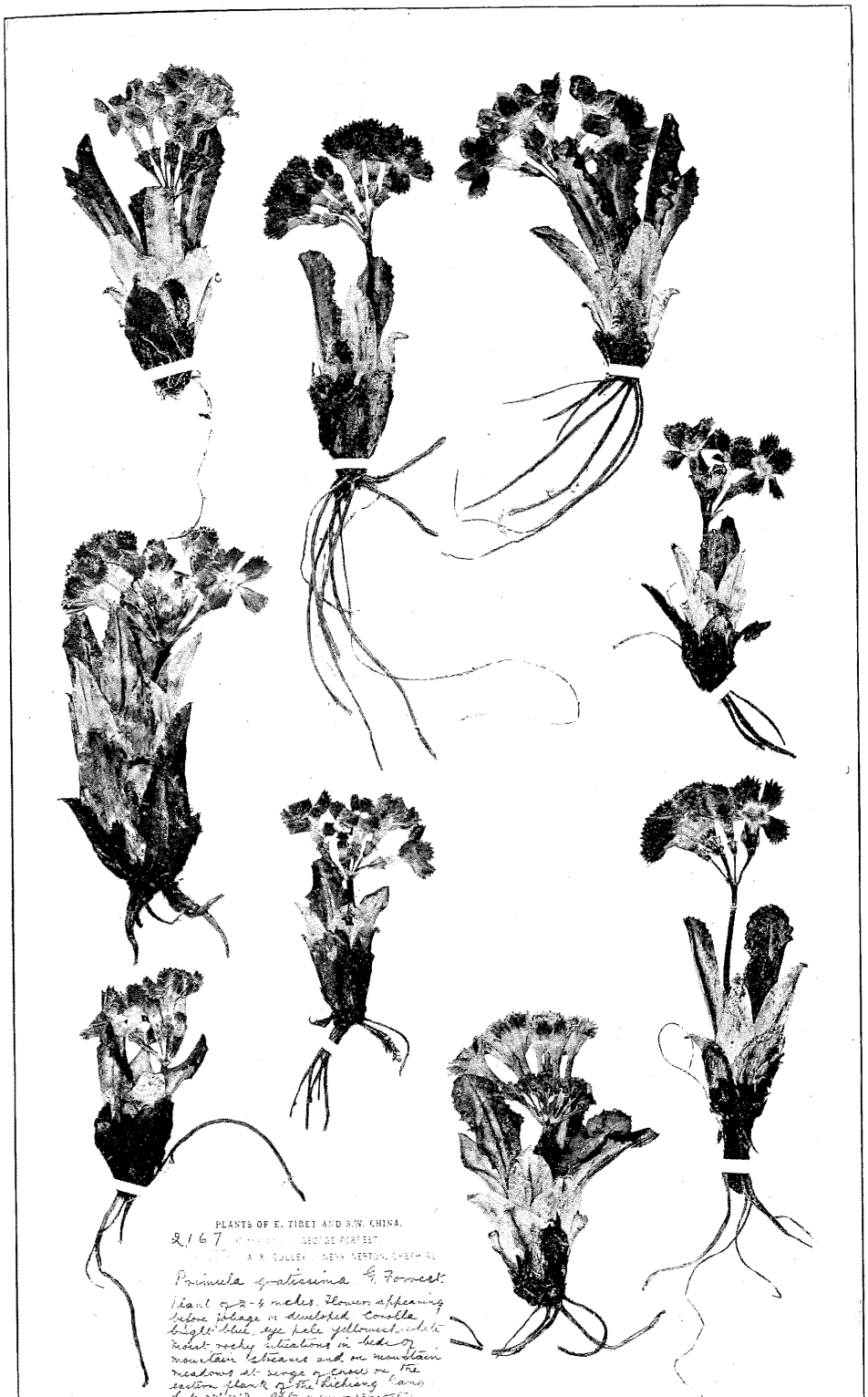
B.—Primula delicata, *G. Forrest.*



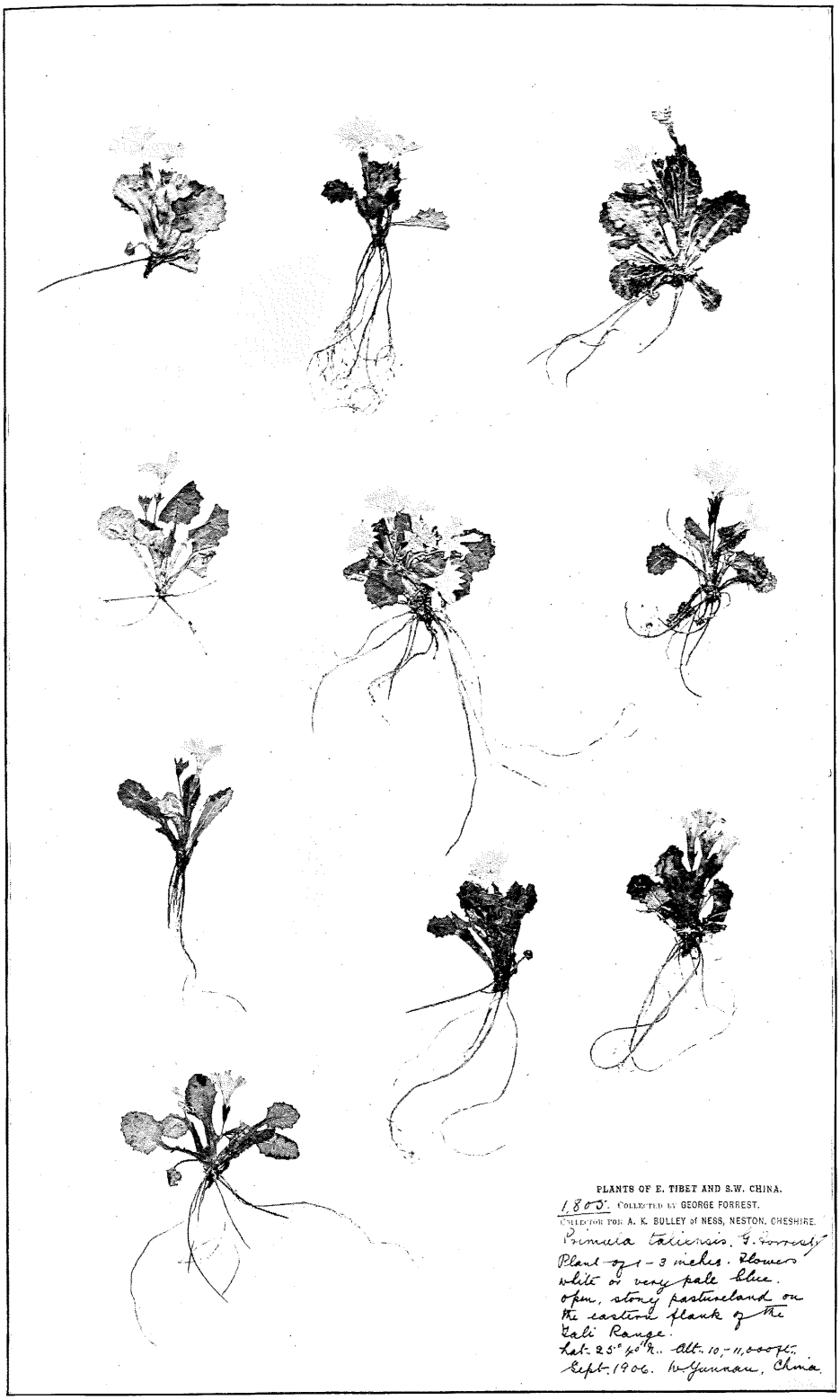
A.—Primula vincaeflora, *Franch.*



B.—Primula gratissima, *G. Forrest.*



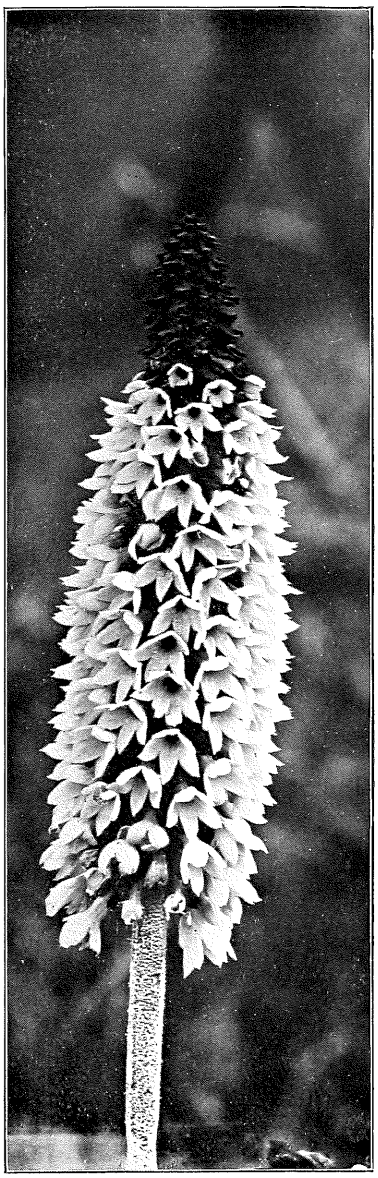
Primula gratissima, *G. Forrest.*



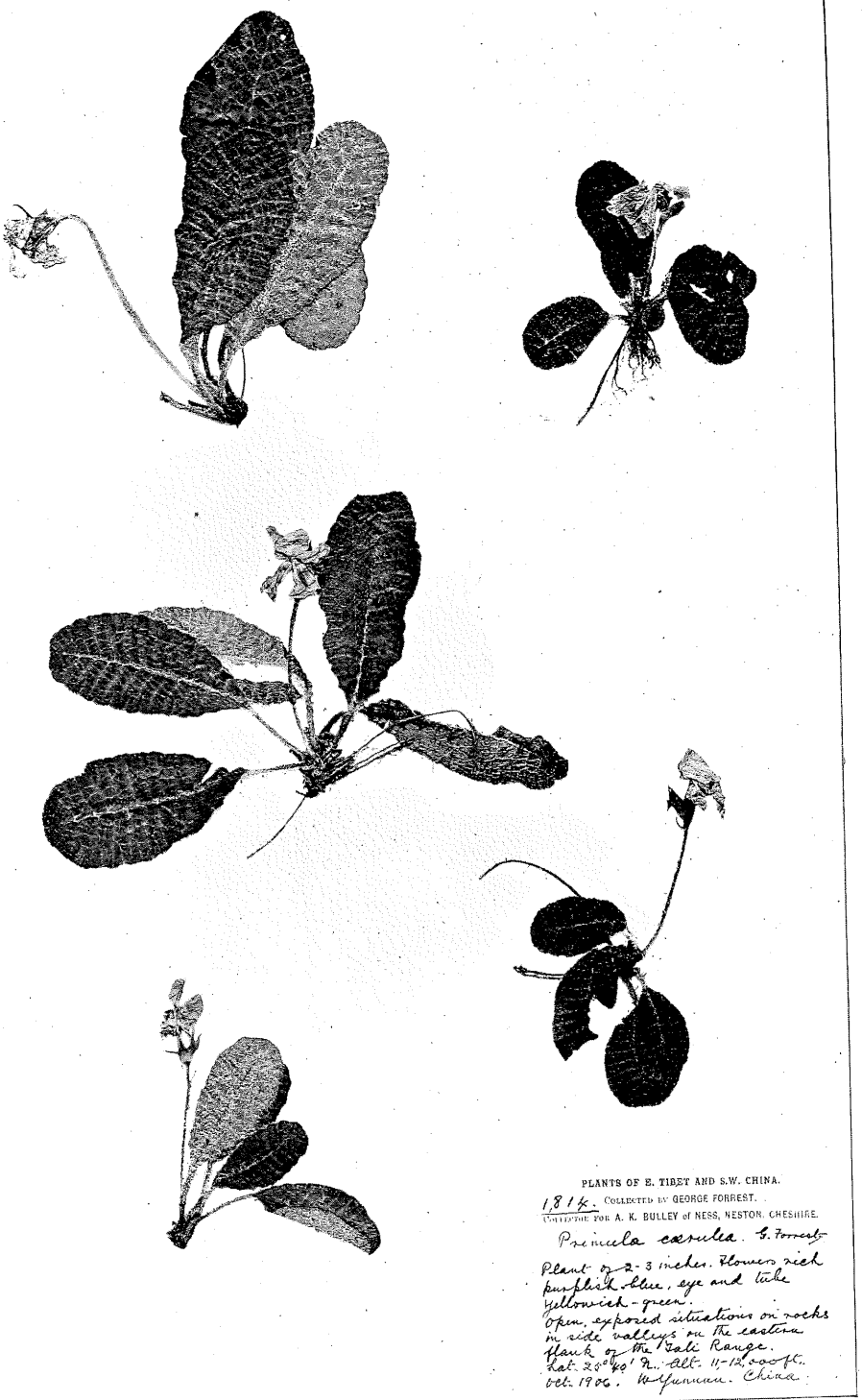
Primula taliensis, *G. Forrest.*



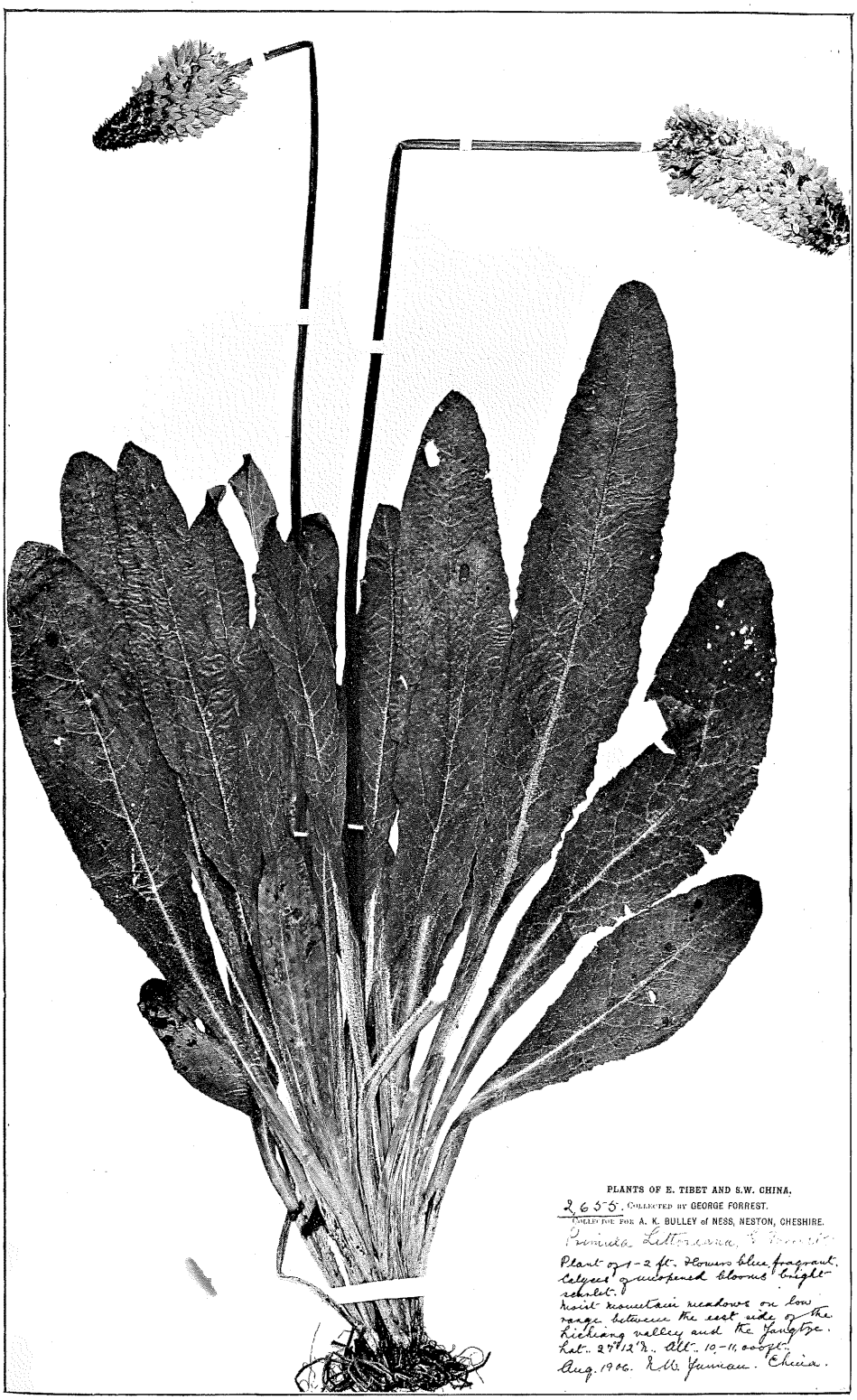
A.—Primula Dubernardiana,
G. Forrest.



B.—Primula Littoniana,
G. Forrest.

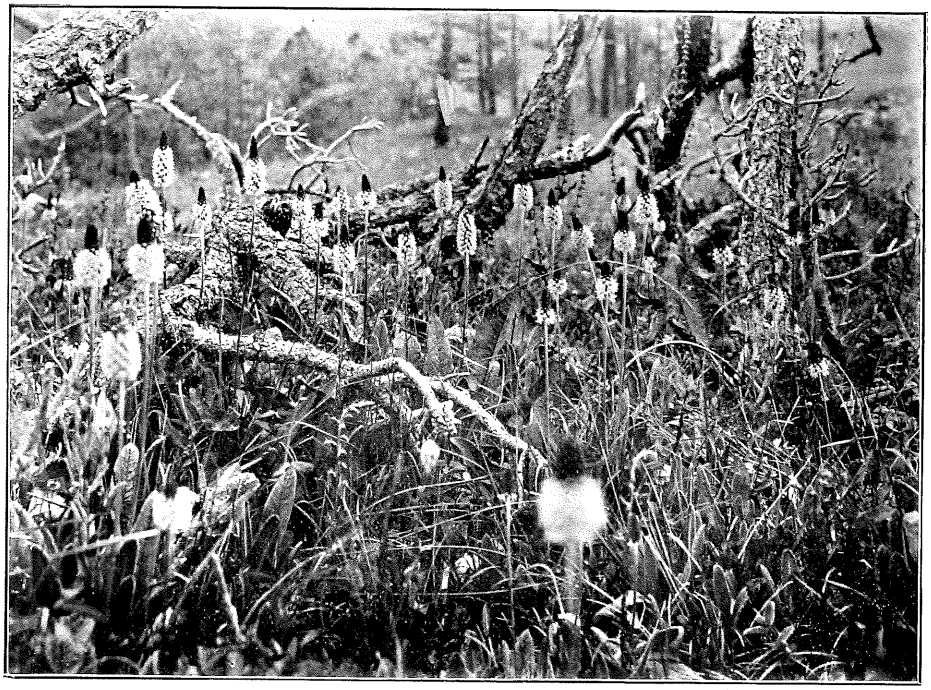


Primula coerulea, *G. Forrest.*



Primula Littoniana, *G. Forrest.*





Primula Littoniana, *G. Forrest.*



Primula longituba, *G. Forrest.*



d

Primula Forrestii, *Balf. fil.*



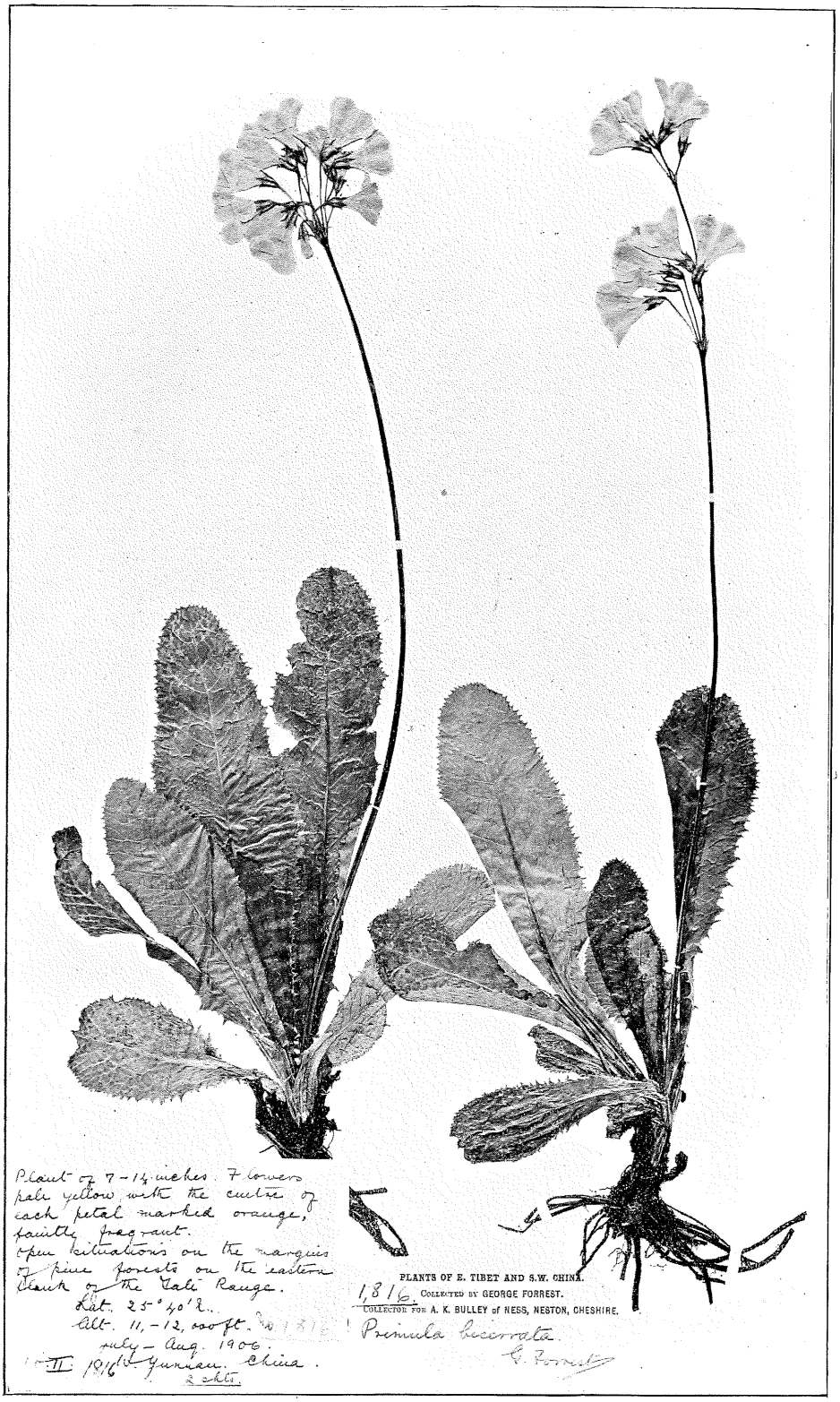
A.—Primula Bulleyana, *G. Forrest.*



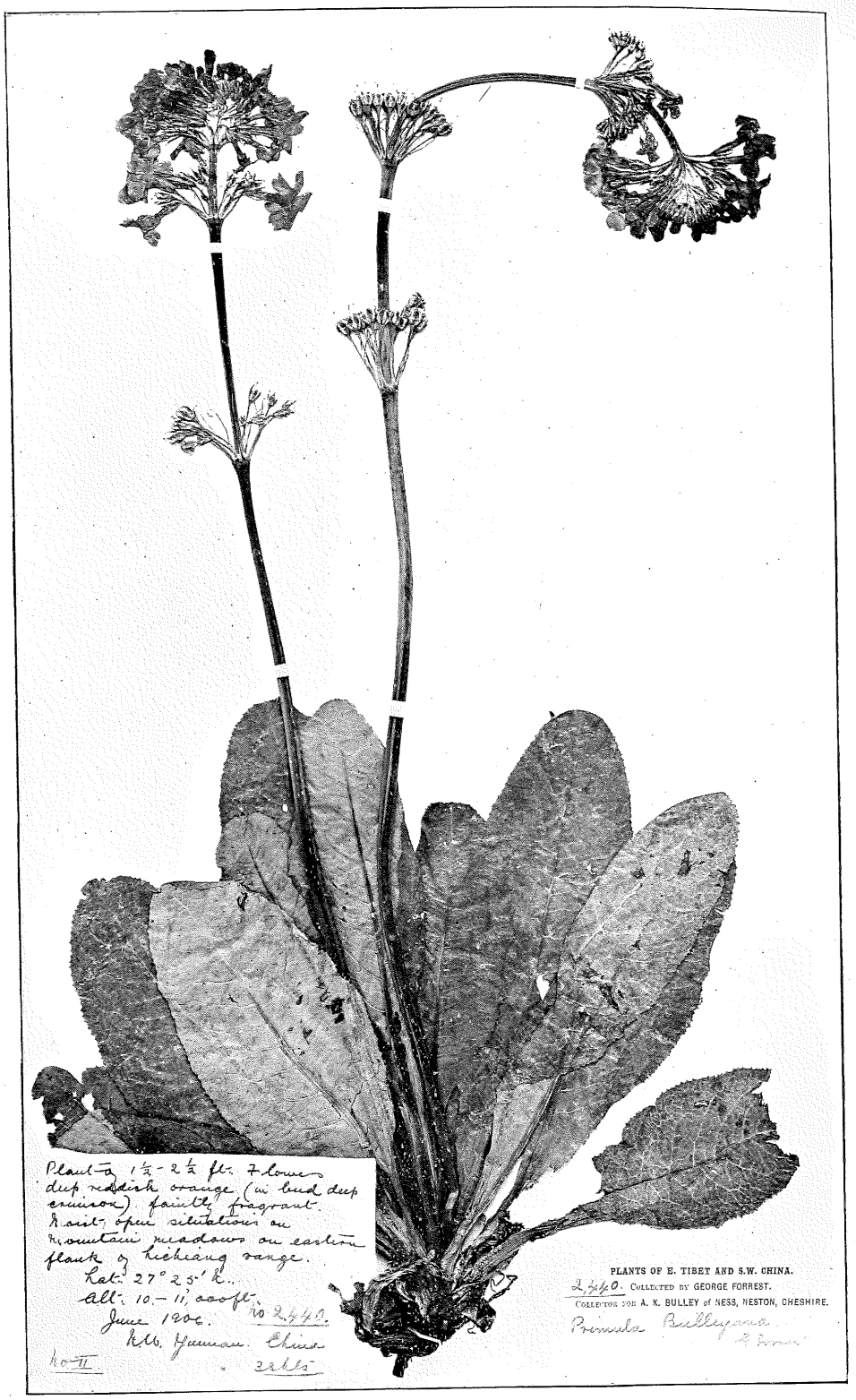
B.—Primula Forrestii, *Balf. fil.*



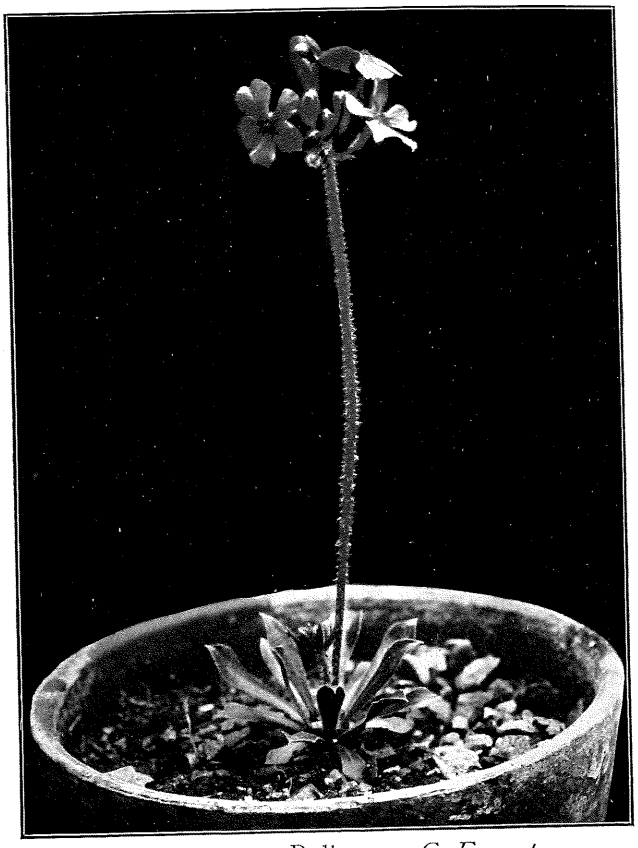
Primula brevifolia, *G. Forrest.*



Primula biserrata, *G. Forrest.*



Primula Bulleyana, *G. Forrest.*



A.—Androsace Bulleyana, *G. Forrest.*



B.—Androsace spinulifera, *Franch.*