

NEW SPECIES OF RHODODENDRON.

BY

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IV.

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***Rhododendron aemulorum*, Balf. f.* (Haematodes.)**

A much-branched shrub or small tree attaining 4 m. in height. Branches stout, those a year old some 6 mm. in diameter, enwrapped in a grey or cinnamon-grey bistrate dense tomentose indumentum about 1 mm. thick, the rosette-hairs of the lower stratum uncoloured of many narrow pointed branches on short stalks, hairs of the upper stratum long cinnamon-tinted with stout many-celled stalk and many ascending besom-clustered thin pointed interlocking branches, the tomentum more or less persistent until decortication after some years. Foliage-buds unknown. Leaves petiolate as much as 15 cm. long; lamina very thick leathery stiff obovate as much as 13 cm. long 8 cm. broad, apex rounded somewhat truncate or retuse with a short stout mucro, margin cartilaginous plane, base obtuse; upper surface dark green rough rugulose and with punctulations from bases of fallen hairs, the midrib raised at base becoming grooved upwards, the primary veins about 12 on each side grooved as are the smaller veins the intermediate surface being raised, glabrous except the midrib and primary veins which are more or less floccose with cinnamon-coloured or grey hairs; under surface cinnamon-brown covered with a dense woolly bistrate tomentum one millimeter or more thick the hairs like those of the stem, midrib more or less prominent and like the rest of venation which is hidden covered by the tomentum; petiole stout about 2.5 cm. long 5 mm. in diameter enwrapped like the stem in tomentum. Flowers in a terminal about 14-flowered compact umbel the rhachis about 1 cm. long densely woolly, the wool orange-coloured; fertile bracts membranous obovate-oblong about 3 cm. long 1 cm. broad orange-coloured silkily

* *Rhododendron aemulorum*, Balf. f.—Frutex multiramis ad 4 m. altus. Rami crassi tomento cinnamomeo dense lanati. Folia petiolata crasse coriacea circ. 15 cm. longa; lamina obovata circ. 13 cm. longa 8 cm. lata apice rotundata saepe emarginata mucronata, basi obtusa; supra rugulosa, costa media floccosa maturitate glabra; subtus cinnamomeo-tomentosa, tomento denso bistrato induta; petiolus crassus tomento pallido denso. Umbella breviter racemosa circ. 14-flora, rhachi lanata; bracteae membranaceae circ. 3 cm. longae obovato-oblongae utrinque sericeae; bracteolae lineares, pedicellis breviores pilo-cristatae; pedicelli decurvati circ. 1.3 cm. longi dense lanati. Calyx obsoletus vel brevissime 5-dentatus lanato-tomentosus. Corolla tubuloso-campanulata postice convexa kermesina maculata circ. 4 cm. longa utrinque glabra 5-lobata; lobi late bilobulati. Stamina 10 corolla gynaeceoque breviora; filamenta glabra. Discus glaber. Gynaeceum corolla paullo brevius; ovarium conoideum circ. 7 mm. longum dense tomentosum; stylus glaber.

hairy outside and towards top inside, finely ciliate at margin; bracteoles narrow linear silkily hairy outside with a long hair crest, about 8 mm. long shorter than pedicels; pedicel stout about 1.3 cm. long densely woolly with orange-yellow hairs, decurved seton very obliquely to the calyx. Calyx obsolete showing 5 minute woolly teeth. Corolla fleshy tubular-campanulate somewhat oblique with a convex posterior side dark crimson darker spotted on all the petals about 4 cm. long glabrous inside and outside; tube shallowly pouched at the base with dark glandular surface in the pouches inside, the posterior larger; limb 5-lobed; lobes short and broad about 1.5 cm. long 2.5 cm. broad, rounded slightly crenulate bilobed. Stamens 10 unequal shorter than corolla and gynaecium, longest about 3 cm. long with anther 2.5 mm. long, shortest about 2 cm. long with anther 2 mm. long; filaments red glabrous hardly expanded downwards; anthers dark black-purple. Disk dark-purple glabrous. Gynaecium about 3.5 cm. long shorter than corolla; ovary conoid about 7 mm. long grooved truncate densely woolly like the pedicels; style glabrous hardly dilated under the small lobulate discoid stigma to which it forms a lip.

W. Yunnan. Eastern flank of the N'Maikha-Salween divide. Lat. 26° N. Alt. 11,000 ft. Shrub of 6-8 ft. Flowers very deep crimson. On open rocky slopes and the margins of thickets. G. Forrest. No. 17,853. April 1919.

W. Yunnan. N'Maikha-Salween divide. Lat. 26° 40' N. Alt. 11,000 ft. Duplicate in immature fruit of No. 17,853. G. Forrest. No. 17,995. June 1919.

W. Yunnan. Same habitat and locality as No. 17,853, of which it is duplicate in fruit. G. Forrest. No. 18,354. July 1919.

N.E. Upper Burma. Hpimaw Pass. Alt. 10,000 ft. Just in bloom on the southerly-facing dip of the Hpimaw Pass, on both sides of which it abounds amid the small bamboo-brake. A dwarfish many-branched thin tree of 15 feet, with brown-felted leaves, and rather waxy flowers of intense scarlet-crimson, without scent. Farrer. No. 815. April 11, 1919.

A species of the *Haematodes* series and a very distinct one. At sight its rugose very thick leaves with bright-coloured under-leaf tomentum and the bilobed lobes of the 5-lobed corolla simulating a 10-lobed one might suggest the *Falconeri* series. But it has no near relationship to that series. From *Rh. haematodes*, Franch., a plant of the Tali Range in Yunnan, the rich-coloured indumentum of the larger leaves suffices to separate it. *Rh. chaetomallum*, Balf. f. et Forrest, from far North in S.E. Tibet, has leaves almost as large, but they are much thinner with a thinner brownish-buff indumentum and

the stems have an indumentum more or less setulose in the upper stratum.

Rhododendron agglutinatum, Balf. f. et Forrest.*

Shrub barely 2 m. high with stout branches showing short annual growths. Branches a year old greenish-yellow glabrous or with a withered greyish patchy trace of juvenile hairs and glands, as much as 4 mm. in diameter. Foliage-buds ovoid pointed; outer scale-leaves rotundate cucullate leathery with thinner margin keeled and mucronate puberulous on back prominently silky inside the margin ciliate with sebaceous hairs very numerous around the mucro, transition-forms more oval, innermost which are carried up on elongating shoot are more or less membranous yellow elongated spathulate pointed and mucronate as much as 2.5 cm. long 8 mm. broad ciliate with sebaceous hairs; young leaves revolute covered on both sides like the young stems with large orange-coloured glands mixed with long branched wide-celled hairs, the hairs fewer and glands more numerous on upper than on under side. Leaves petiolate as much as 10 cm. long; lamina leathery oblong-oval or oblong sometimes a little broader above the middle as much as 8.5 cm. long 3.5 cm. broad, apex obtuse or somewhat acute sometimes almost rounded with a red short mucro, margin cartila-

* *Rhododendron agglutinatum*, Balf. f. et Forrest.—Frutex vix 2 m. altus ramis crassis. Rami annotini viridi-flavi glabri vel indumenti juvenilis vestigiis conspersi circ. 4 mm. diam. Alabastra ovoidea acuta; perulae extimae coriaceae rotundatae mucronulatae nunc subcaudatae utrinque puberulae; intimae submembranaceae oblongo-spathulatae ad 2.5 cm. longae 8 mm. latae sebaceo-ciliatae; folia juvenilia revoluta utrinque dense glandulosa et floccosa. Folia petiolata ad 10 cm. longa; lamina coriacea oblongo-ovalis vel oblonga semel subobovalis ad 8.5 cm. longa 3.5 cm. lata obtusa vel subacuta vel subrotundata breviter mucronata margine paullo recurva cartilaginea, basi subtrunculata vel cordulata; supra atro-olivacea nunc rubida glabra (costa media indumenti juvenilis vestigiis conspersa) in morem squali corii rugulosa, costa media rubra sulcata, venis primariis utrinsecus circ. 15 rubris leviter sulcatis; subtus atrofulva ubique indumenti pellicula laevi agglutinata pilorum glandularumque vestita, costa media elevata, laete flava (ubi nudata); petiolus crassus circ. 1.5 cm. longus laete flavus saepe indumenti vestigiis conspersus. Flores in racemo-umbellam compactam circ. 10-12-floram aggregati, rhachi puberula et glandulosa circ. 5 mm. longa; bracteae fertiles obovato-spathulatae mucronulatae utrinque lanato-sericeae; bracteolae filiformes vix 3 mm. longae pilosae et pilocristatae; pedicelli circ. 1.5 cm. longi sparsim glandulosi et floccosi saepe rubri. Calyx parvus vix 1 mm. longus inconspicue puberulus minute 5-dentatus vel 5-lobatus. Corolla alba vel rosea maculata evariculata circ. 3.5 cm. longa saepe erecta infundibuliformi-campanulata vel subnutans et oblique campanulata extus glabra, intus puberula 5-loba; lobi emarginati lati circ. 1.5 cm. longi 2 cm. lati. Stamina 10 inaequalia corolla gynaeceoque multo breviora; filamenta villosa. Discus puberulus. Gynaeceum corolla brevius circ. 2.5 cm. longum; ovarium circ. 3.5 mm. longum sulcatum truncatum glabrum; stylus glaber sub stigmatate lobulato paullo expansus.

ginous slightly recurved, base truncate or sometimes approaching cordulate with narrow lateral lobes; upper surface dark olive-green with a tinge of red conspicuously shagreened, glabrous all except the grooved red midrib in which are withered hairs and glands, primary veins some 15 on each side red and slightly grooved; under surface dark tawny covered by persistent agglutinate indumentum forming a pellicle over the whole surface including the raised midrib and primary veins (which latter it conceals), where pellicle removed the midrib appears bright yellow and this is seen particularly in its thicker part towards base of lamina, indumentum formed of a mixture of the glands and long-branched broad cells of the juvenile leaves now glued together into a more or less uniform or slightly areolate skin; petiole about 1.5 cm. long stout bright yellow rarely a trace of the juvenile hairs and glands. Flowers in small compact raceme-umbels of some 10-12 flowers; the rhachis about 5 mm. long puberulous and glandular; fertile bracts broadly obovate spatulate as much as 2 cm. long 1 cm. broad densely silkily woolly; bracteoles filiform very short about 3 mm. long thickly pilose and hair-crested; pedicels short about 1.5 cm. long sometimes longer sometimes shorter often red sparingly glandular and floccose. Calyx small hardly 1 mm. long reddened with 5 obtuse rounded or pointed lobes puberulous and shortly ciliate. Corolla about 3.5 cm. long erect and nearly regular funnel-shaped campanulate or nodding and irregular campanulate washed rose with many conspicuous crimson dots over posterior side glabrous outside, puberulous at base inside, expanding into a 5-lobed limb; lobes broad about 1.5 cm. long about 2 cm. broad emarginate. Stamens 10 unequal much shorter than corolla and gynaeceum, longest about 2 cm. long, shortest about 1 cm. long; filaments broad villous over a greater part of length from base; anthers about 2 mm. long. Disk copiously puberulous. Gynaeceum about 2.5 cm. long shorter than corolla; ovary about 3.5 mm. long cylindric deeply grooved truncate glabrous; style glabrous stout slightly expanded below the lobulate stigma.

S.W. Szechwan. Mountains around Mu-li. Lat. 28° 12' N. Alt. 12,000-13,000 ft. In Rhododendron forest. Shrub of 4-6 ft. Flowers white with crimson markings. G. Forrest. No. 16,319. June 1918.

S.W. Szechwan. Mu-li Mountains. Lat. 28° 12' N. Alt. 11,000-12,000 ft. Open rocky slopes. Shrub of 4-6 ft. Flowers washed rose deepest in bud with crimson markings. G. Forrest. No. 16,435. June 1918.

S.W. Szechwan. Mu-li Mountains. Lat. 28° 12' N. Alt. 12,000 ft. On open rocky slopes. Shrub of 4-6 ft. Flowers

creamy white with few markings. G. Forrest. No. 16,459. June 1918.

N.W. Yunnan. Western slopes of the Bei-ma-Shan. Lat. 28° 18' N. Alt. 13,000 ft. In open thickets. Shrub of 3-5 ft. Flowers rose or white flushed rose with crimson markings. G. Forrest. No. 16,489. July 1918.

A species which recalls *Rh. phaeochrysum*, Balf. f. et W. W. Sm., but is smaller in all its parts and is at once recognised by the bright yellow petioles and midribs of the same colour where the indumentum is removed.

***Rhododendron arizelum*,* Balf. f. et Forrest.† (Falconeri.)**

Robust shrub or small tree as much as 6 m. high. Branches stout, those of the year about 7 mm. in diameter enwrapped in a cinnamon-coloured tomentum, those a year old often over 1 cm. in diameter glabrescent blackening, traces of the tomentum remaining until decortication, bark flaking off leaving a pale reddish smooth surface. Foliage-buds conical large; 5 or 6 outermost scale-leaves imbricate elongated triangular tapering from a broad base to an acuminate tip, or with a wide basal portion and a long tail, insertion broad half-moon shaped, hard woody keeled, cobwebbed outside, glabrous somewhat glossy inside, margin ciliate with cobwebbed hairs which form a tuft at the tip; inner bracts convolute ovate and mucronate slightly keeled sticky forming the chamber to the revolute erect young leaves. Leaves large petiolate as much as 18 cm. long; lamina very thick leathery obovate as much as 15 cm. long 8 cm. broad, apex rounded usually slightly emarginate with a hydathodal

* ἀρίζηλος, notable—in allusion to its qualities.

† *Rhododendron arizelum*, Balf. f. et Forrest.—Frutex robustus ad 6 m. altus. Rami crassi annotini tomentosi glabrescentes. Alabastra foliorum conica; perulae extimae acuminatae albido-tomentosae; intimae plus minusve ovatae convolutae viscidae. Folia petiolata ad 18 cm. longa; lamina crasse coriacea obovata ad 15 cm. longa 8 cm. lata, apice rotundata emarginata, margine cartilaginea, basi obtusa vel subtruncata; supra atroviridis rugulosa indumenti juvenilis vestigiis conspersa; subtus cinnamomeo-tomentosa indumento bistrato induta, strati superi pilis infundibuliformibus e muro labioque poculi ramos plurimos copiose emittentibus, inferi rosulatis agglutinatis pelliculam crustaceam construentibus; petiolus validus ad 3 cm. longus cylindricus esulcatus glabrescens. Inflorescentia racemoso-umbellata circ. 15-flora, rhachi tomentosa; bractae extimae rotundatae viscidae, intimae fertiles oblongo-obovatae extus intusque sericeae; bracteolae lineares circ. 1 cm. longae; pedicelli inaequales ad 2.5 cm. longi sub fructu aucti tomentosi. Calyx minutus 8-dentatus. Corolla flavida basi roseo-suffusa oblique campanulata 8-loba. Stamina 16 corolla gynaeceoque breviora; filamenta puberula. Discus glaber. Gynaeceum corolla brevius; ovarium ovoideum 15-16-loculare pilis fasciatis dense tomentosum; stylus glaber staminibus longior sub stigmate late discoideo clavatus. Capsula curvata pilis aurantiacis plus minusve vestita. Semina complanata arillata.

mucro in the sinus or in smaller leaves somewhat obtuse and ending in a long projecting mucro, margin broadly cartilaginous somewhat undulate, base obtuse or subtruncate or even cordulate; upper surface dark green rugulose and somewhat shagreened more or less splatched with dirty grey vestiges of a thin juvenile coating of cobwebbed hairs, midrib raised at base depressed upwards always clad with grey cobwebbed hairs, primary veins some 12 on each side slightly depressed spreading outwards at a right angle or slightly obtuse angle; under surface cinnamon-coloured clad all over (the raised midrib and hardly visible veins included) with a dense bistrate persistent indumentum, upper stratum cinnamon-colour persistent of narrow funnel-shaped cup-hairs easily separable each with short multicellular stalk the wall of cells elongated in the axis of the cup and with thicker ridges from which as well as from the margin proceed many thick-walled branches which interlace and give a woolly character to the whole surface, under stratum persistent always concealed by upper stratum white of rosette-hairs with very short stalks, the cells of the hairs thin-walled vesicular agglutinated; petiole not bearded stout as much as 3 cm. long 6 mm. in diameter gradually passing into the ridged midrib above and below cylindric not grooved upper side with white cobwebbed hairs under surface cinnamon-coloured often glabrescent above. Inflorescence-bud globose. Inflorescence a racemose umbel of 15 or more flowers, rhachis stout more or less cinnamon-tomentose; outermost sterile bracts a few like those of foliage-buds, followed by many sterile bracts rounded to ovate often with thinner marginal wing all more or less sticky and remaining adherent as flowers open; inner fertile bracts thin leathery oblong-obovate about 2.5 cm. long 1 cm. broad rounded at top and mucronate, inside finely silky towards top, outside densely and coarsely silky; bracteoles linear barely 1 cm. long shorter than pedicel, densely adpressedly hairy outside, hair-crested; pedicels stout straight somewhat unequal as much as 2.5 cm. long elongating in fruit to 3.5 cm., swollen at the oblique top below the flower, tomentose with long branching thin-walled intricately interwoven hairs, no cup-hairs. Calyx only indicated by some tomentose short points sharp or blunt. Corolla fleshy pale yellow with crimson or rose flush at base, campanulate oblique, posterior side arched and somewhat ventricose longer as much as 4.5 cm. long, hardly pouched at base 8-lobed; lobes rounded imbricate usually emarginate often slightly crenulate about 1 cm. long 1.8 cm. broad, glabrous outside and inside. Stamens 16 slightly unequal shorter than corolla-tube and gynaeceum longest about 2.5 cm. long shortest about 1.5 cm. long; anthers broad about 3 mm. long; filaments dilated down-

wards sparingly puberulous for a short distance above the base. Disk glabrous. Gynaeceum a little shorter than corolla on upper side about 4 cm. long; ovary ovoid-truncate 15-locular slightly curved grooved eglandular densely tomentose with pink tinted indumentum of fasciate hairs; style stout glabrous exceeding the stamens ending in a broad lobulate stigma. Capsule slightly curved oblong-ovoid about 3.5 cm. long 1 cm. broad more or less clad with cinnamon-coloured indumentum of orange-coloured fasciate hairs, dehiscing by 12-15 single or a less number of compound (2-4) valves (or these intermixed) leaving 12-15 placentas on the axis. Seeds pale-brown flattened oblong or oval or elliptic or oboval as much as 3 mm. long 1.5 mm. across with a conspicuous lateral arillate wing, a broad fringed membranous arillar chalazal crest and a smaller micropylar one.

W. Yunnan. Shweli-Salween divide. Lat. 25° 20' N. Alt. 11,000-12,000 ft. Open situations and in Rhododendron forest. Shrub of 15-20 ft. Flowers fleshy, pale yellow flushed rose towards base. G. Forrest. No. 15,857. July 1917.

W. Yunnan. Shweli-Salween divide. Lat. 25° 30' N. Alt. 11,000 ft. In open thickets. Shrub of 6-10 ft. Flowers pale yellow with crimson at base. G. Forrest. No. 15,898. June 1917.

Yunnan. [Without precise locality.] Duplicate in fruit. Oct. 1917. G. Forrest. No. 15,982.

N.E. Upper Burma. Hpimaw Pass. Alt. 9500-10,500 ft. Low many-branched red-barked tree with thick trusses of dead creamy-white flowers without scent. Just coming out April 20. One of the prevailing rhododendrons as you near the Pass. R. Farrer. No. 863. April 20, 1919.

N.E. Upper Burma. Ridge along Laktang (Kang Fang route). Alt. 9000-11,000 ft. The commonest rhododendron between 9000 and 11,000 ft. Gnarled much-branched tree up to 20 or 25 ft. high, or bushy shrub of 10-15 ft. at 10,000 ft. or higher. Bark red, hanging in flakes. Flowers pale cream with small purple blotch at base of corolla which is almost regular. The flower is very like No. 3061 [*Rh. sidereum*], but not so yellow. The leaves are quite different, being rusty red underneath with thick indumentum. F. Kingdon Ward. No. 3101. May 27, 1919.

A fine species of the Falconeri series allied to *Rh. Falconeri*, Hook. f. It is the nearest approach to *Rh. Falconeri* amongst the Chinese species, but is altogether a smaller plant than the Himalayan species. It differs in one conspicuous character—it has no glands on the ovary or style. These glands are most characteristic of *Rh. Falconeri* and its ally *Rh. eximium*, Nutt. In the latter they form the only cover to the ovary in *Rh. Falconeri*, they are always intermixed with stalked branched

hairs which in the type are so numerous and have such curled interlocking branches that the presence of glands is concealed and this probably accounts for the omission of reference to glands in the descriptions of *Rh. Falconeri*. In some forms of what is called *Rh. Falconeri* these hairs are comparatively few but I have not seen a specimen from which the hairs were entirely absent nor have I seen one from which the glands were absent. There is, however, more than one plant included in the *Rh. Falconeri* of Herbaria and probably also of gardens and investigation of the species is much needed. There is no trace in *Rh. arizelum* of the bearding on the petiole which marks *Rh. eximium*.

The cup hairs of the indumentum are here much shorter than those of *Rh. Falconeri* and *Rh. eximium*, but have the stiff branched habit which is so conspicuous in these, and they can be separated from one another without difficulty.

***Rhododendron australe*, Balf. f. et Forrest.* (Ovatum.)**

A slender-branched twiggy shrub as much as 2.5 m. high. Branches a year old about 1.5 mm. in diameter pale green densely pubescent with the curved simple (fish-hook) hairs of the Ovatum series also glandular with long stoutly stalked ovoid glands sprinkled amongst the hairs, the indumentum persisting more or less until decortication after three years or so. Annual growths usually about 5 cm. long with the foliage-leaves more or less clustered at the top and as they persist for about 3 years they form false whorls on the stems demarcating the successive annual growths. Mature foliage-buds unknown. Leaves petiolate as much as 9.5 cm. long sometimes the lower ones on the twig distant from the apical clustered ones; lamina papery about 7.5 cm. long and 3 cm. broad oblong or oblong-lanceolate or oblong-oval, apex acuminate and tapered

* *Rhododendron australe*, Balf. f. et Forrest.—Frutex ad 2.5 m. altus. Rami tenues annotini circ. 1.5 mm. diam. pubescentes glandulosi. Folia petiolata ad 9.5 cm. longa saltem triennia; lamina tenuis papyracea oblonga vel oblongo-lanceolata vel oblongo-ovalis ad 7.5 cm. longa 3 cm. lata sursum in mucronem elongatum attenuata, margine minute cartilaginea leviter aspersa, basi late obtusa; supra nitens olivacea, subtus pallidior; utrinque costa media pilis hamatis puberula caeteroquin glabra; petiolus puberulus et glandulosus circ. 2 cm. longus. Flores in quaque inflorescentia 4 in axillis foliorum superiorum singulatum dispositi, quisque bracteatus bracteis sub anthesi persistentibus amplexicaulibus; pedicelli circ. 1.5 cm. longi puberuli et glandulosi. Calyx subfoliaceus circ. 7 mm. longus 5-fissus; cupula extus puberula et glandulosa; lobi ovati vel subelliptici apice rotundati extus glabri glanduloso-fimbriati eciliati. Corolla rosea sparsim maculata aperte cupularis circ. 3.3 cm. longa extus glabra intus puberula 5-loba; lobi elliptici vel ovaes subaequales circ. 2 cm. longi 1.8 cm. lati emarginati crenulati. Stamina 5 inaequalia longissima corollam subaequantia; filamenta pilis longis haud vesiculososis puberula. Discus puberulus. Gynaeceum circ. 3.5 cm. longum corollam superans; ovarium circ. 3 mm. longum petasiforme glandulosum; stylus glaber.

into a prominent hydathodal mucro 1 mm. long tuberculate at top, margin very finely cartilaginous flat obscurely undulate and marked by the red scars of fallen glands, base broadly obtuse, last leaves of the shoot around the terminal bud much smaller often elliptic with lamina 1.5 cm. long 1 cm. broad; upper surface bright olive-green glossy, midrib elevated in a groove and puberulous with curved hairs, surface otherwise glabrous, primary veins 10-12 on each side and with the secondary veins forming a prominent network (in dry leaf) the ultimate veinlets very small and forming a reddish network with very small meshes; under surface much paler opaque smooth, midrib slightly pink-tinted elevated and more or less puberulous surface otherwise glabrous, primary veins pink-tinted conspicuous as are some of the secondary veins; on both sides faintly punctulate with bases of fallen glands; petiole pale green about 2 cm. long densely puberulous and glandular like stem. Inflorescence composed of 1-flowered axillary umbels fasciculate at the end of the twigs usually 4 in each fascicle, no terminal umbel; each member of the fascicle encircled at base by persistent crustaceous buff-coloured bracts; inflorescence-bud ovoid; outer bracts very small rounded or half-moon-shaped, inner bracts ovate or rounded-ovate cucullate puberulous outside and gland-fringed, the innermost bracts grasping the pedicel; pedicel about 1.5 cm. long pubescent and glandular with curled hairs and ovoid red long-stalked glands. Calyx somewhat foliaceous 7 mm. long cut to near base into 5 lobes; cup puberulous and glandular outside, puberulous inside only at the base; lobes large membranous ovate or somewhat elliptic rounded or obtuse 5 mm. broad venation flabelliform glabrous on the back and inside, densely fringed with red or orange-coloured glands not hair-ciliate. Corolla about 3.3 cm. long openly campanulate or bowl-shaped deep rose with a few inconspicuous crimson spots on posterior petal, somewhat thin glabrous outside, puberulous at base inside, 5-lobed; lobes somewhat unequal (antero-lateral larger) somewhat elliptic or oval about 2 cm. long and 1.8 cm. broad emarginate crenulate. Stamens 5 unequal, longest about 3.2 cm. long with anther 4 mm. long, about equalling the corolla, shortest about 2.2 cm. long with anther 3 mm. long; filaments orange-coloured slightly broadened downwards, from the base to near the middle villous with long thin pointed hairs eglandular. Disk puberulous below ovary. Gynaeceum about 3.5 cm. long exceeding corolla and stamens; ovary about 3 mm. long somewhat dome-shaped dark-coloured slightly grooved and truncate glandular on the ridges and at apex, less so in the grooves; style orange-red glabrous slightly expanded under the lobulate stigma.

W. Yunnan. Type from Tengyueh. G. Forrest. [Without number.]

W. Yunnan. Shweli-Salween divide. Lat. 25° 30' N. Alt. 10,000 ft. In open thickets. Shrub of 6-8 ft. Flowers deep rose. G. Forrest. No. 15,673. June 1917.

A species of the *Ovatum* series representing in the southern area of Western Yunnan *Rh. leptothrium*, Balf. f. et Forrest, of the northern area (Li-ti-ping and the Mekong-Yangtze divide), from which it is easily separated by its brighter green foliage, the leaves as a rule tapered into the long mucro not emarginate or truncate below it with a much closer ultimate reticulation of the veins, larger flowers, lobes of the calyx gland-fringed not hair-ciliate.

***Rhododendron chaetomallum*,* Balf. f. et Forrest.† (Haematodes.)**

Shrub as much as 1.5 m. high with thin straight divergent twiggy branches, those a year old about 2 mm. in diameter bearing rosettes of 4-6 leaves at the end, the last leaves of a year usually very small and ensheathing the terminal bud, leaves persisting often for two years. Branches of the year reddened densely clad with a bistrato indumentum, the upper stratum of long wavy intermingling bristle-hairs reddened below sometimes unbranched but usually ending in a tuft of short pointed branches the under stratum of white flocks of shortly branching intricately interwoven hairs, indumentum more or less detersile in the reddened twigs a year old but vestiges remain on the grey older parts of the branches until decortication, nodular swellings at end of each season's growth which average about 5 cm. in length. Terminal foliage-buds ovoid pointed enclosed by the last foliage-leaves of the year which have long convolute vaginal petioles and much reduced lamina the whole

* *χαίτη*, loose flowing hair; *μαλλός*, fleece—in allusion to the indumentum.

† *Rhododendron chaetomallum*, Balf. f. et Forrest.—Frutex ad 1.5 m. altus. Rami tenues stricti indumento bistrato setarum rubrarum et pilorum floccosorum obtecti. Alabastrorum perulae extimae longe caudatae mox deciduae. Folia petiolata ad 9.5 cm. longa; lamina coriacea obovata vel oblongo-obovata ad 9 cm. longa 4 cm. lata, apice rotundata apiculato-mucronata, margine cartilaginea subplana, basi obtusa; supra olivacea floccorum vestigiis conspersa; subtus fulvo-cinnamomea indumento bistrato tomentoso demum subagglutinato vestita; petiolus circ. 5 mm. longus setulosus et floccosus. Umbella 4-6-flora; pedicelli circ. 1.5 cm. longi setulosi eglandulosi. Calyx ruber ad 3 mm. longus cupularis; cupula glabra; lobi 5 rotundati floccoso-ciliati decidui. Corolla tubuloso-campanulata circ. 4 cm. longa atro-coccinea glabra 5-lobata; lobi lati emarginati. Stamina 10 inaequalia corolla breviora, longissima gynaeceo longiora; filamenta glabra. Discus glaber. Gynaeceum corolla multo brevius circ. 2.3 cm. longum; ovarium petasiforme circ. 3 mm. longum dense flavo-tomentosum; stylus glaber. Capsula recta circ. 1.5 cm. longa 7 mm. diam. dense tomentosa valvis 5-10 dehiscentis.

showing transition to scale-leaves, scale-leaves falling as bud expands; outer scale-leaves as much as 1.5 cm. long, longer than the body of the bud, woody with short broad base tapering upwards into a long keeled tail ending in a red apicular tip its margins recurving grey outside with an indumentum of intricately woven branching hairs; intermediate scale-leaves oval oblong apiculate clad like the outer; innermost scale-leaves membranous yellowish or yellow-green carried up on the elongating shoot as much as 4 cm. long spatulate and tapering into a long apiculus, pubescent on back with interlocking floccose hairs and flock-fringed, hairs densely clustered round the tapering point; young leaves revolute in bud with a white sparse indumentum of rosette long-branched hairs on upper surface, below densely tomentose white. Leaves petiolate as much as 9.5 cm. long; lamina leathery obovate or oblong-obovate as much as 9 cm. long 4 cm. broad apex rounded or even subtruncate with a short apiculus and red tuberculate mucro, margin cartilaginous entire, base obtuse and more or less decurrent on petiole; upper surface dark olive-green mat shagreened sprinkled with vestiges of juvenile rosette flocks, midrib grooved lined by flock-hairs, primary veins 10-12 on each side slightly grooved; under surface dark tawny clad everywhere with a bistrate persistent indumentum, the hairs of upper stratum with long zigzag many-celled stems much branched the branches interweaving and ultimately becoming slightly agglutinate so that the leaf-surface does not appear woolly and honeycombed but somewhat smooth, often in older leaves cracking slightly, under stratum of rosette-hairs with hardly any stalk the few branches of each rosette long twisted pointed, midrib raised slightly reddened covered by the indumentum, primary veins hardly showing; petiole about 5 mm. long grooved above clad with an indumentum like the stem. Flowers in 4-6-flowered terminal umbels; outer bracts like the outer scale-leaves of foliage-bud and of like size followed by oblong broad crustaceous bracts with cucullate upper half thinner on the margin, innermost fertile bracts yellow silky obovate nearly 2 cm. long; bracteoles thin linear and spatulate about 1 cm. long shorter than pedicel densely pilose from base; pedicel about 1.5 cm. long densely clad with long bristle-hairs branched at the tip eglandular hardly expanded below the calyx. Calyx red somewhat fleshy about 3 mm. long cup-shaped glabrous on back cut to about half its length into 5 rounded or pointed flock-fringed lobes ultimately splitting down interpretative lines and falling off from base of cup. Corolla deep crimson tubular-campanulate about 4 cm. long glabrous inside and outside 5-lobed; tube slightly fleshy at base and there slightly gibbous and retuse; lobes rounded broad about 1.5 cm.

long 2.2 cm. broad emarginate. Stamens 10 much shorter than corolla, unequal longest about 2.6 cm. long, shortest about 1.6 cm. long; filaments white glabrous dilated downwards; anthers dark crimson. Disk glabrous. Gynaecium shorter than longest stamens about 2.3 cm. long; ovary dome-shaped broad truncate deeply grooved about 3 mm. long densely clad with a yellow tomentum composed of long fasciate firm hairs; style stout glabrous expanded below the discoid lobulate pale stigma where it forms a lip. Capsule straight about 1.5 cm. long 7 mm. in diameter densely brown-woolly dehiscing from apex to base by 5-10 woody valves, style often persisting.

S.E. Tibet. On Doker-la, Mekong-Salween divide. Lat. $28^{\circ}25'$ N. Alt. 12,000-13,000 ft. Open bouldery slopes. Shrub of 3-4 ft. Flowers deep crimson. G. Forrest. No. 16,691. July 1918.

S.E. Tibet. Ka-gwr-pw, Mekong-Salween divide. Lat. $28^{\circ}35'$ N. Alt. 12,000 ft. Open situations amongst rocks. Shrub of 4-5 ft. In fruit. G. Forrest. No. 14,987. Oct. 1917.

Western N.W. Yunnan. At Na-ki-lu, Mekong-Salween divide. Lat. $27^{\circ}50'$ N. Alt. 11,000-12,000 ft. In open thickets and on boulder-strewn slopes. Shrub of 4 ft. Flowers? probably deep crimson. G. Forrest. No. 17,329. Oct. 1918.

Western N.W. Yunnan. On the Si-la Pass, Mekong-Salween divide. Lat. $28^{\circ}12'$ N. Alt. 13,000 ft. Shrub of 2-4 ft. Duplicate in fruit. G. Forrest. No. 17,330. Oct. 1918.

In *Rh. chaetomallum* we have a member of the *Haematodes* series from far N.W. Yunnan and S.E. Tibet, representing there *Rh. haematodes*, Franch. which is a plant of the Tali Range and *Rh. aemulorum*, Balf. f. which is a southern representative of the series on the Shweli-Salween divide and in N.E. Upper Burma. From both of these the setulose indumentum on the stem and leaf-petioles give a distinction. In general habit of growth *Rh. chaetomallum* recalls the type—developed so markedly in the Tsarong—which is seen in *Rh. eudoxum*, Balf. f. et Forrest and its allies and in *Rh. sanguineum*, Franch. and its allies. But here the indumentum has evolved as a thick somewhat loose tomentum over the under surface of leaf in contrast with the thin detersile form it assumes in the *Rh. eudoxum* phylum and the agglutinate pellicle-like condition in which it appears in the *Rh. sanguineum* phylum. The linking of all these forms will be an interesting task for those who deal with *Rhododendrons* some years hence, when the species in the centre of distribution of the genus have been discovered and identified.

Rh. chaetomallum is one of the species of *Rhododendron* in which mycophyllon appears.* Some of the leaves have quite a blackened under surface through the development of fungus.

* See Notes R.B.G. Edin., xii (1919), 145.

Rhododendron chloranthum,* Balf. f. et Forrest.† (Trichocladum.)

Deciduous-leaved shrub about 1 m. high with slender somewhat twiggy branches and leaves deciduous after one season, the flowers appearing annually slightly before the leaves. Branches of the year green barely 1 mm. in diameter densely clad with long undulate setae covering a few distant whitish or yellowish peltate scales, the one-year-old whitish-grey branches more sparingly setose and often glabrescent, older branches dark grey and with vestiges of the setae and scales. Foliage-buds fusiform scale-leaves all deciduous as bud opens; outermost scale-leaves crustaceous bright brown rounded glabrous outside and finely and shortly ciliate above, followed by oblong-oval ones of like character, innermost scale-leaves somewhat membranous paler or somewhat greenish-yellow narrowly oblong-oval about 1.2 cm. long 3 mm. broad densely lepidote along the middle outside sparingly ciliate on margin below densely so over the rounded tip and around the red mucro; young leaves conduplicate-convolute glabrous above, lepidote and setulose below, setulose-ciliate; foliage-buds in axil of one or two last leaves of flower-shoot, which are set close below the flower-bud, not developing and thus is left a short gap between the inflorescence and elongating lateral foliage-shoots below it. Leaves (not quite mature) petiolate as much as 4.3 cm. long; lamina thin papery oval or oboval as much as 3.8 cm. long 2 cm. broad, apex rounded often somewhat retuse at point of origin of short mucro, margin plane red setulose-ciliate, base broadly obtuse or rounded; upper

* χλωρός, green-yellow—in allusion to the flower-colour.

† *Rhododendron chloranthum*, Balf. f. et Forrest.—Frutex circ. 1 m. altus foliis annuis floribusque praecocibus. Rami subvirgati hornotini circ. 1 mm. diam. lepidoti pilis setiformibus dense obtecti, annotini subglabrescentes. Alabastra fusiformia; perulae extimae crustaceae rotundatae extus glabrae, intermediae oblongo-ovales, intimae submembranaceae anguste oblongo-ovales circ. 1.2 cm. longae extus dense lepidotae. Folia (vix matura) petiolata ad 4.3 cm. longa; lamina papyracea ovalis vel obovalis ad 3.8 cm. longa 2 cm. lata, apice rotundata mucronata alata nunc retusa, margine plana tenuis rubra setuloso-ciliata; supra atroviridis glaberrima costa media et venis primariis rubris subelevatis; subtus pallidior plus minusve setulosa discontigue lepidota squamulis inter se 1 mm. distantibus; petiolus ruber circ. 5 mm. longus. Flores in racemo-umbellam brevem 4–5-floram dispositi, rhachi pubescente lepidota; bractae mox deciduae interiores extus puberulae et lepidotae; bracteolae lineares apicem versus lepidotae et setulosae; pedicelli ad 2.5 cm. longi sparsim lepidoti et setulosi. Calyx 5-lobi; lobi rotundati vel semilunati inaequales ad 2 mm. longi sparsim lepidoti esetulosi. Corolla flavido-viridis maculata a basi campanulata vix 2 cm. longa extus lepidota epilosa intus puberula; lobi 5 rotundati circ. 6 mm. longi 1 cm. lati integri. Stamina 10 inaequalia corollam subaequantia; filamenta villosa. Discus glaber. Gynaecium staminibus longioribus brevius; ovarium circ. 4 mm. longum petasiforme truncatum sparse lepidotum; stylus validus declinatus ovario longior glaber ad apicem clavatus; stigma lobulatum.

surface dark blackish-green mat glabrous, midrib and primary veins (about 10 on each side) raised red; under surface paler grey-green lepidote with small distant peltate raised unequal scales with thick umbo and hardly any fringe 1 or 2 scales in a sq. mm. also setulose more or less usually more densely so along raised red midrib and primary veins very densely towards base; petiole red about 5 mm. long densely setulose. Inflorescence a 4-5-flowered terminal shortly racemose umbel, rhachis whitely pubescent and lepidote; inflorescence-bud globose; bracts and bracteoles deciduous as bud opens, outer bracts brown coriaceous ovate pointed glabrous, inner bracts coriaceous rounded convolute densely lepidote and puberulous outside 1.3 cm. long; bracteoles linear about 1.3 cm. long shortly pilose below setulose towards base and lepidote towards apex; pedicels varying in length as flowers open successively at most 2.5 cm. long stiff stoutish dark green becoming dark purple very sparingly lepidote and setulose sometimes glabrescent swollen below the calyx and there very dark-coloured. Calyx small at most 2 mm. long usually less with 5 unequal membranous lobes rounded or semilunate sparingly lepidote outside or with a scale-fringe or glabrous, occasionally some minute marginal cilia. Corolla light yellow tinged green at base, spotted green posteriorly, campanulate from base barely 2 cm. long lepidote and epilose, outside puberulous, inside at base expanding into a spreading 5-lobed limb; lobes rounded entire about 6 mm. long 1 cm. broad. Stamens 10 unequal, longest about equalling corolla, shortest about 7 mm. long; filaments stout greenish-yellow, glabrous at base often over 3 mm. in posterior stamens which are densely villous within corolla-tube the hairs stout long vesicular white, over about 1 mm. in others which have shorter and fewer hairs; anthers ochre-coloured about 2 mm. long. Disk glabrous. Gynaeceum shorter than corolla and longest stamens about 1 cm. long; ovary about 4 mm. long dome-shaped truncate shallowly grooved sparingly lepidote; style stout glabrous deflexed broadly expanded at top below the lobulate stigma. Capsule short straight about 5 mm. long dehiscent from apex by 5 valves.

N.W. Yunnan. Li-ti-ping. Lat. $27^{\circ} 12' N$. Alt. 11,000 ft. Open situations amongst scrub. Shrub of 2-4 ft. Flowers more or less precocious, light yellow tinged green at base. G. Forrest. No. 13,900. June 1917.

One of the *Trichocladum* series. Its nearest ally is *Rh. melinanthum*, Balf. f. et Ward, from which it may at once be distinguished by the underleaf indumentum. In *Rh. chloranthum* the scales are distant seldom more than 1 mm., whilst in *Rh. melinanthum* they are much closer, some 4 to 5 in each

square mm. Then in the former the style is shorter not longer than the longest stamens. From *Rh. trichocladum*, Franch. itself the calyx without bristles separates it. From *Rh. xanthinum*, Balf. f. et W. W. Sm. the absence of hairs on outside of corolla is a diagnostic mark.

***Rhododendron coryphaeum*,* Balf. f. et Forrest.† (Grande.)**

Robust shrub with thick branches, those a year old about 1 cm. in diameter coated with a whitish crustaceous indumentum of cobwebbed more or less agglutinate hairs traces of which remain on the older stems. Foliage-bud unknown. Leaves epetiolate as much as 25 cm. long thickly leathery broadly oblanceolate or narrowly oblong-obovate broadest at the apex and there as much as 9 cm. broad then tapered gradually to the base, apex rounded or subtruncate sometimes slightly retuse, mucronate the mucro rounded tuberculate very short sometimes turned downwards, margin broadly cartilaginous slightly recurved, at the base the lamina is prolonged downwards to point of insertion of leaf where it may be nearly 2 cm. broad the basal portion simulating a winged petiole; upper surface mat green somewhat rugulose shagreened glabrous, the midrib grooved and lined with vestiges of a juvenile hair-indumentum at the base passing into a broad ungrooved wrinkled ridge recalling the surface of a petiole, primary veins some 14-16 on each side emerging from midrib at an acute angle and sharply ascending slightly grooved; under surface white or grey-white covered by a thin indumentum of long branching intricately interwoven hairs

* *κορυφαῖος*, leading—in allusion to its size.

† *Rhododendron coryphaeum*, Balf. f. et Forrest.—Frutex robustus ramis crassis indumento sordide albido crustaceo plus minusve indutis. Folia ad 25 cm. longa subepetiolata late oblanceolata vel anguste oblongo-obovata ad 9 cm. lata ab apice rotundato vel subtruncato paullo retuso mucronatoque deorsum gradatim attenuata (margine cartilagineo) ad insertionem saepe 1.5 cm. lata; supra opaca subrugulosa glabra, costa media sulcata sulco vestigiis pilorum juvenilium impleto basi in pulvinum elevatum prolongata, venis primariis impressis utrinque 14-16 a costa media acute divergentibus; subtus albida indumento tenui crustaceo subnitido laevi vestita, costa media venisque primariis elevatis glabrescentibus. Flores circ. 15 in racemoso-umbellam dispositi, rhachi brevi vix 2 cm. longa; bracteae exteriores steriles rotundatae vel ovatae viscidae, intimae fertiles oblongo-spathulatae extus intusque sericeae; bracteolae breves circ. 5 mm. longae pilosae; pedicelli circ. 2 cm. longi indumento adpresso vestiti. Calyx minute dentatus. Corolla obliqua campanulata varo basali rubro maculisque paucis notata circ. 4.5 cm. longa glabra 8-lobata; lobi imbricati rotundati emarginati. Stamina 16 inaequalia corolla gynaeceoque breviora; filamenta glabra. Discus glaber. Gynaeceum corolla paullo brevius; ovarium oblongo-ovoideum 10-loculare, pilis fasciatis dense tomentosum; stylus glaber. Capsula curvata, ad 4 cm. longa pilis fasciatis aurantiacis plus minusve vestita. Semina brunnea complanata anguste arillata et crista membranacea chalazali notata.

and rosulate hairs with broad branches, the whole forming an agglutinate crustaceous persistent smooth somewhat glossy layer, midrib very prominent brownish or blackish-purple glabrescent, primary veins very prominent ribs more or less glabrescent. Inflorescence a compact racemose umbel of some 15 flowers with a short rhachis barely 2 cm. long clad with thin pellicle of indumentum; inflorescence-bud globose; outer sterile bracts rotundate to ovate thick coriaceous with thinner margins mucronate viscid, inner fertile bracts oblong spatulate or obovate-spatulate or spatulate about 3 cm. long 1.5 cm. broad sericeous inside and outside; bracteoles short linear about 5 mm. long or a little more pilose and hair-crested; pedicels short about 2 cm. long enwrapped in a thin indumentum of long branched somewhat agglutinate hairs slightly expanded under the calyx and oblique to the flower. Calyx minute clad like the pedicel very shortly toothed. Corolla campanulate oblique with a small red basal blotch and a few spots posteriorly, about 4.5 cm. long on posterior side, glabrous inside and outside hardly gibbous at the base 8-lobed; lobes imbricate about 1 cm. long 1.5 cm. broad emarginate. Stamens 16 unequal shorter than corolla and gynaecium, longest about 3.5 cm. long shortest about 2.5 cm.; filaments glabrous; anthers oblong about 3 mm. long. Disk glabrous. Gynaecium a little shorter than corolla; ovary oblong-ovoid truncate 10-locular grooved densely clad with a pink tomentum of fasciate hairs with stout long stalks and erect branches; style glabrous stout slightly club-shaped below the discoid broad lobulate stigma. Capsule curved as much as 4 cm. long over 1 cm. in diameter more or less tomentose with orange-coloured fasciate hairs with stout stalks and short erect branches. Seeds flat brown about 2.5 mm. long 1 mm. across with a narrow lateral aril-wing, a large chalazal membranous crest, and trace of a funicular fringe.

Western N.W. Yunnan. Mekong-Salween divide. Lat. 28° 12' N. Alt. 11,000–12,000 ft. Duplicate of 1917. G. Forrest. No. 16,561. June 1918.

Yunnan. [Without precise locality.] Duplicate of F. No. In fruit. G. Forrest. No. 17,420. Oct. 1918.

Plant of the Grande series, a near ally of *Rh. praestans*, Balf. f. et W. W. Sm. It is a smaller-leaved species with the primary veins coming off and ascending at about half a right angle from the midrib, and the indumentum is almost persistently grey in tint. The flowers of its compact trusses have much shorter pedicels and the ovary is consistently 10-chambered in contrast to the 8-chambered ovary of *Rh. praestans*. As in *Rh. praestans* the leaves can hardly be described as petiolate. The lamina extends right to the point of insertion of the leaf.

Rhododendron cymbomorphum, *Balf. f. et Forrest. † (Souliei.)

Virgate shrub as much as 2.5 m. high. Branches slender straight when a year old about 2 mm. in diameter. Young branches dark purple glandular the glands short-stalked ovoid red, persisting (their bases only) as small reddish warts on the older pale buff-coloured twigs. Foliage-buds elongated narrow fusiform pointed; outer scale-leaves crustaceous rounded often split at apex sometimes with a short point, epilose outside or with a few greasy hairs, margin sparsely ciliate with greasy hairs more at the top, followed by more oblong blunt scale-leaves; innermost scale-leaves carried up on elongating axis nearly oblong or oblanceolate or lanceolate as much as 4 cm. long 6 mm. broad at middle, acute or acuminate narrowed downwards into a distinct petiole, red-glandular at base outside over petiole and along midrib, finely sparingly ciliate; young leaves revolute in bud glabrous above, below densely clad with short erect unbranched greasy orange or white hairs, petiole glandular. Leaves petiolate as much as 11.5 cm. long 4-5 produced each year towards end of twig sometimes one or two lower down not persisting over second year; lamina thin of parchment consistence oblong-oval or oblong as much as 9 cm. long 4 cm. broad, broadly obtuse at apex ending in a shortly beaked tuberculate red mucro, margin flat narrowly cartilaginous and slightly pink-tinted, base truncate or rounded or subcordulate; upper surface olive-green mat finely shagreened glabrous, midrib grooved glabrous, primary veins some 12-15 on each side; under surface paler grey-green clad all over with vestiges of short greasy juvenile hairs often orange-coloured, midrib raised pink glabrous, primary veins and ultimate venation submerged

* κύμβος, cup—in allusion to form of corolla.

† *Rhododendron cymbomorphum*, Balf. f. et Forrest.—Frutex ad 2.5 m. altus. Rami tenues stricti (annotini circ. 2 mm. diam.), juveniles purpurei glandulosi, vetustiores pallide fulvi glanduloso-punctulati. Alabastra fusiformia; perulae extimae crustaceae extus epilosae margine sparsim sebaceo-ciliatae; intimae oblongo-lanceolatae vel oblanceolatae petiolatae acutae basi rubro-glandulosae. Folia ad 11.5 cm. longa petiolata; lamina chartacea oblongo-ovalis vel oblonga ad 9 cm. longa 4 cm. lata, apice rotundata vel late obtusa mucronata, margine plana, basi truncata vel rotundata vel subcordulata; supra olivacea opaca glabra; subtus griseo-viridis venis ultimis intricatim ramosissimis rubris notata pilis brevibus caulifloris sebaceis oblecta; petiolus ad 2.5 cm. longus purpureis glandulosus. Flores in umbellas vel racemo-umbellas 4-7-floras dispositi rhachi glandulosa; bracteolae pedicellis multo breviores; pedicelli ad 3.5 cm. longi purpurei patentes glandulosi sub calyce expansi. Calyx 5-lobus extus glandulosus; lobi oblongi apice rotundati. Corolla alba vel flava emaculata aperte cupulari-campanulata circ. 4 cm. longa utrinque glabra 5-loba; lobi lati circ. 2 cm. longi 2.5 cm. lati emarginati. Stamina 10 inaequalia corolla gynaeceoque breviora; filamenta obscure puberula. Discus glaber. Gynaeceum corolla paullo brevius; ovarium circ. 3.5 mm. longum conoideum sulcatum truncatum dense rubro-glandulosum; stylus ad medium glandulis rubris aurantiaco-stipitatis vestitus.

showing as a very fine much-branched reddish reticulum; petiole as much as 2.5 cm. long red grooved above, glabrous but with vestiges of the juvenile red glands. Flowers in a terminal 4-7-flowered umbel or shortly racemose umbel, the rhachis red-glandular; bracts unknown; bracteoles shorter than pedicels about 8 mm. long linear slightly clavate at top pilose throughout not markedly hair-crested; pedicels 2.5-3.5 cm. long expanded beneath the calyx spreading purple sparingly glandular with ovoid stalked red glands. Calyx conspicuous about 4 mm. long with a cup about 1 mm. sparingly glandular outside, 5-lobed; lobes yellowish oblong rounded at top about 3 mm. long sprinkled with glands. Corolla yellow without spots or blotch openly cup-shaped or widely campanulate from the base 4 cm. or a little more long, longer than stamens and gynaecium, glabrous outside and inside, 5-lobed; lobes broad nearly orbicular about 2 cm. long 2.5 cm. broad emarginate. Stamens 10 unequal all shorter than corolla and gynaecium, longest about 2.5 cm. long, shortest about 1.5 cm.; filaments slightly expanded downwards obscurely puberulous above the base the hairs often mere vesicular papillae. Disk glabrous. Gynaecium shorter than corolla longer than stamens about 3.5 cm. long or a little more; ovary conoid grooved truncate 3.5 mm. long densely red-glandular, the stalks of the glands yellow; style glandular with long yellow-stalked glands to about its middle, slightly expanded below the lobulate dark-coloured stigma.

N.W. Yunnan. On the Bei-ma-Shan. Lat. 28° 12' N. Alt. 11,000-12,000 ft. Shady pine forests and amongst scrub. Shrub of 4-8 ft. Flowers yellow without markings. G. Forrest. No. 13,939. June 1917.

One of the Souliei series, with markedly oblong leaves and glandular petioles and stems and bearing yellow flowers with yellowish calyx-lobes, puberulous stamens, and style glandular to the middle. In this corolla it approaches *Rh. Wardii*, W. W. Sm. and *Rh. croceum*, Balf. f. et W. W. Sm., but the colour is not so intense and the flowers are smaller. *Rh. panteumorphum*, Balf. f. et W. W. Sm. of the Selse series, is not unlike our plant, and has also yellow flowers, but it has a glabrous style. Forrest has collected quite a number of forms of the Souliei and Selse series showing that the type which includes many good garden plants is widespread in N.W. Yunnan.

Rhododendron dendritrichum*, Balf. f. et Forrest.

Shrub as much as 4.5 m. high with stout branches. Branches a year old about 4 mm. in diameter ash-grey through a close

* *Rhododendron dendritrichum*, Balf. f. et Forrest.—Frutex ad 4.5 m. altus ramis crassis. Ramuli annotini circ. 4 mm. diam. indumento griseo subaggluti-

coating of indumentum composed of closely interwoven branched stalked hairs which are more or less agglutinate and persist more or less until decortication. Foliage-buds unknown. Leaves triennial petiolate deflexed at flowering as much as 18.5 cm. long; lamina leathery oblanceolate as much as 16.5 cm. long 4.5 cm. broad, apex somewhat beaked with a short apiculus often curved and ending in a small red hydatheal mucro, margin cartilaginous obscurely undulate and distantly faintly notched, tapered to the cuneate base; upper surface opaque olive-green minutely shagreened glabrous, midrib and rest of venation dark red, midrib deeply and narrowly grooved, primary veins 20 or more on each side slightly grooved; under surface at first a true buff-colour afterwards paling covered all over including the raised midrib by a woolly persistent indumentum with a slightly honeycombed surface and composed of an understratum of hardly stalked rosette-hairs with many short thin vesicular branches and an upper luxuriant stratum of remarkable tree-like hairs with a thick many-celled trunk and abundant recurving long cylindric pointed branches from its base upwards which curl and take on a tendrillar form at their ends and so interlock; petiole stout about 2 cm. long clad like the young stem. Flowers in a terminal very shortly racemose umbel of 15 or more flowers, rhachis barely 1 cm. long glabrous or with a sprinkling of short floccose hairs; bracts falling early unknown; bracteoles filiform much shorter than pedicels about 1 cm. long pilose throughout and with a white hair-crest; pedicels strict slender erect crowded 2–2.5 cm. long sparingly floccose expanded and slightly oblique under the flower. Calyx very small not 1 mm. long dark crimson fleshy glabrous with an undulate somewhat paler erose margin showing 5 minute teeth. Corolla oblique on the pedicel in the lateral flowers of the truss, funnel-shaped-campanulate from the base about 3.5 cm. long white faintly flushed rose with deep crimson basal posterior blotch

nato plus minusve persistente vestiti. Folia triennia petiolata ad 18.5 cm. longa; lamina coriacea oblanceolata ad 16.5 cm. longa 4.5 cm. lata, apice subrostrata, margine cartilaginea plana, deorsum in basim cuneatam attenuata; supra olivacea opaca glabra rubro-venulosa; subtus indumento bistrato pallide fulvo superficieque subalveolari ubique (costa media elevata inclusa) vestita, indumenti pilis supernis dendriformibus fibrillosis; petiolus crassus ut ramuli vestitus. Flores in racemo-umbellam circ. 15-floram aggregati rhachi vix 1 cm. longa obscure floccosa; bracteolae breves circ. 1 cm. longae filiformes pilosae et pilo-cristatae; pedicelli tenues stricti sparsim floccosi sub calyce expansi. Calyx parvus vix 1 mm. longus carnosulus glaber ruber margine eroso-undulatus obscure 5-dentatus. Corolla alba maculata et varo coccineo basali notata infundibulari-campanulata circ. 3.5 cm. longa glabra 5-loba; lobi rotundati emarginati. Stamina 10 inaequalia corolla gynaeceoque breviora; filamenta lata minutissime puberula. Discus glaber. Gynaeceum circ. 3 cm. longum; ovarium elongatum tenue cylindricum truncatum circ. 6.5 mm. longum glabrum; stylus validus glaber stamina superans.

and a few oblong spots above it glabrous outside and inside, slightly pouched at base expanding into an open 5-lobed limb; lobes rounded emarginate about 7 mm. long and 1.4 cm. broad. Stamens 10 unequal all shorter than corolla and gynaeceum, longest about 2.8 cm. long with anther 2.5 mm. long, shortest about 1.8 cm. long with anther 2 mm. long; filaments broad minutely puberulous at base the hairs no more than vesicular spheres. Disk glabrous. Gynaeceum about 3 cm. long a little shorter than corolla and longer than stamens; ovary long thin cylindric about 6.5 mm. long slightly grooved truncate glabrous; style glabrous stout expanding below the discoid lobulate stigma to which it supplies an encircling lip.

West N.W. Yunnan. Mekong-Salween divide. Lat. 28° 12' N. Alt. 12,000–13,000 ft. In pine and rhododendron forest. Shrub of 10–15 ft. Flowers white faintly flushed rose, with crimson markings and a blotch of same shade at base. G. Forrest. No. 16,366. March 1918.

A species of the group of large-leaved Rhododendrons with woolly persistent indumentum in which the calyx is very small, the corolla more or less funnel-shaped with a basal blotch and spots and the ovary and style glabrous. It is distinguished by the branched tree-like form of the hairs of the indumentum with the branches curled and tendril-like forming a slightly honey-combed undersurface to the leaf.

Rhododendron eclectum,* Balf. f. et Forrest.† (Thomsoni.)

Shrub as much as 2.5 m. high with stout straight branches. Branches of the year stiff purple with a glaucous bloom and glandular, the glands red ovoid on conspicuous stalks, 2.3 mm. in diameter, year old branches as much as 6 mm. in diameter yellowish becoming ash-grey punctulate with the bases of fallen glands. Foliage-buds are nest buds red ovoid short pointed;

* ἐκλεκτός, to be chosen out—as a plant worthy of cultivation.

† *Rhododendron eclectum*, Balf. f. et Forrest.—Frutex ad 2.5 m. altus. Rami hornotini stricti glauco-purpurei glandulosi, annotini ad 6 mm. diam. punctulati. Alabastra purpurea glabra. Folia petiolata ad 16.5 cm. longa saepe multo breviora; lamina ad 14.5 cm. longa 6 cm. lata elongato-obovata, apice rotundata mucronata, margine late cartilaginea saepe purpurea, basi cordulata; supra grisea cerae pellicula vestita; subtus subfulva glaberrima costa media venisque primariis plus minusve rubidis; petiolus ad 2 cm. longus ruber glaberrimus. Flores in racemo-umbellam circ. 12-florum dispositi, rhachi glauco-purpurea glabra; pedicelli validi circ. 2 cm. longi glabri glauco-purpurei. Calyx magnus ad 1 cm. longus cupularis ultra medium 5-partitus extus glaber; lobi ovati vel oblongo-ovales glabri striati post anthesin aucti. Corolla tubuloso-campanulata maculata et variculata carnosula 5-loba; lobi rotundati lati emarginati circ. 1 cm. longi 2 cm. lati. Stamina corolla breviora; filamenta glabra. Discus glaber. Gynaeceum corollam subaequans; ovarium ovoideum truncatum sulcatum dense glandulosum; stylus glaber. Capsula cylindrica circ. 2 cm. longa 7 mm. diam. glandulosa. Semina pallida elongata circ. 3 mm. longa .5 mm. lata.

several outer perulae half foliar with a broad red vaginal portion and upper green lamina gradually becoming more scale-like and acuminate; intermediate broadly rounded firm red mucronulate quite glabrous; innermost thinner and glutinous with colleters on back cemented to form the chamber for the foliage-leaves, on expansion submembranous carried up on the elongating shoot red foliaceous about 2.5 cm. long 6 mm. broad with an ovoid limb tapering upwards into a long acuminate point ending in a red hydathode and downwards into a broad petiole a little shorter than the limb; young leaves dark purple with red venation revolute glabrous. Leaves shortly petiolate, at maturity as much as 16.5 cm. long but often less sometimes only about one-third that length; lamina thickly leathery obovate typically with the outline of a jargonelle pear, the shorter leaves sometimes only oblong as much as 14.5 cm. long 6 cm. broad, apex rounded often truncate and retuse in the middle with a stout tuberculate red mucro, margin broadly cartilaginous entire, often purple-red, base cordulate; upper surface coated with a grey thin pellicle of wax (soluble in benzole) covering a bright green or purple reddish foveolate surface, midrib and primary veins (about 15 on each side very regular and ascending) slightly grooved under the wax-pellicle; under surface in the leaves with green upper surface tawny green, in leaves with red upper surface tawny, elevated midrib and primary veins (not raised) red tinted the whole surface most glabrous and smooth but in dry state ultimate venation sometimes appearing as a slightly raised reticulum; petiole broad red and glaucous as much as 2 cm. long usually less, grooved without hairs or glands. Flowers in a terminal many-flowered shortly racemose umbel, as many as 12 flowers in the umbel, rhachis dark purple glabrous as much as 1.5 cm. long; bracts and bracteoles unknown; pedicels stout about 2 cm. long dark red-purple glaucous glabrous expanding into the cup of the calyx. Calyx cupular-campanulate about 1 cm. long 5-lobed; cup somewhat fleshy glabrous 2-3 mm. long; lobes subcrustaceous ovate or oblong-oval with rounded tip striate and glabrous persistent and enlarging around fruit. Corolla tubular-campanulate faintly spotted posteriorly and with a median basal blotch about 4.5 cm. long somewhat fleshy; tube in narrow lower part one half length of corolla retuse and 5-pouched at base with darker blotch in each pouch, glabrous outside and inside, expanding into a broad spreading 5-lobed limb; lobes broad rounded emarginate about 1 cm. long 2 cm. broad. Stamens shorter than corolla and gynaecium; filaments glabrous. Disk glabrous. Gynaecium about as long as corolla; ovary stout ovoid grooved truncate densely glandular with ovoid red-stalked glands with wax bloom between the glands;

style stout glabrous expanding into a conspicuous lip below the lobulate stigma. Capsule cylindric about 2 cm. long 7 mm. in diameter shallowly grooved more or less glandular or with traces of glands sticky more or less enclosed by the enlarged hardened calyx, dehiscing by 5 valves from the apex style often persistent after dehiscence. Seeds pale-coloured elongated about 3 mm. long about .5 mm. in diameter with a chalazal and a funicular fringed crest.

Yunnan. [Without precise locality.] Duplicate in fruit. G. Forrest. No. 14,804. Sept. 1917.

S.E. Tibet. Tsarong. On Ka-gwr-pw, Mekong-Salween divide. Lat. 28° 25' N. Alt. 13,000 ft. In rhododendron thickets. Shrub of 6-8 ft. In fruit. G. Forrest. No. 14,485. July 1917.

Yunnan. [Without precise locality.] Duplicate in fruit. G. Forrest. No. 15,298. Nov. 1917.

Yunnan. [Without precise locality.] Duplicate in fruit. G. Forrest. No. 17,475. Nov. 1918.

A fine species from that home of good things, Ka-gwr-pw. The plant has more than one special feature of interest.

In the first place, the foliage is noteworthy—thick fleshy leaves the outline of which is exactly that of a jargonelle pear and with an ash-grey upper surface which is due to a thin pellicle of wax covering it everywhere. A little benzole or other solvent placed on the surface removes the wax and exposes the coloured leaf-surface beneath, which is also of interest. In most of the older leaves the surface is green but the veins are more or less reddened; the young leaves are red all over and this red colour may be retained more or less in the older leaves and show on removal of the wax. Another feature of the foliage deserves notice. The young leaves on the annual shoots elongating after flowering and from below the inflorescence in all the specimens available for examination produce leaves much smaller than those on the older branches and more oblong in character. No one of the lateral twigs on branches now passed into fruit has leaves of the size and shape of the mature leaves on the flower-bearing shoots, and we must assume therefore that the growth of the leaves is much prolonged and that only towards the end of the season of each annual shoot do its leaves take on their adult character.

Then in the flower we have to note that the ovary is densely glandular but the style is wholly glabrous. The plant does not leave us in doubt about its affinity. It is one of the Thomsoni series using that term in its widest sense as I explained it in a previous number of these Notes.* This glandular ovary

* Notes R.B.G. Edin., x (1918), 98.

associated with a glabrous style belongs to forms aggregating around *Rh. selense*, Franch. in what we have called the Selense series, but the other characters of our plant are much more those of *Rh. Thomsoni*, Hook. f. and its Chinese form *Rh. cyanocarpum*, Franch. of the Thomsoni series in its restricted sense. And so *Rh. eclecereum* may be cited as additional evidence in support of the view that natural relationships are best expressed by grouping together in one rather than by segregating into three series the plants which have been placed in the series *Campylocarpum*, *Selense*, and *Thomsoni* (in limited sense) respectively. In this connection should be mentioned *Rh. Meddianum*, G. Forrest, a new species (see p. 136) from the Shweli-Salween divide and the nearest ally of *Rh. eclecereum*. It is in fact the southern form of the phylum which finds northern representation in *Rh. eclecereum*. *Rh. Meddianum* has the same type of leaf with ash-grey wax pellicle as occurs in *Rh. eclecereum* but it does not produce glandular shoots and its less glandular character extends to the gynaeceum of which the ovary and style are alike glabrous. Glands mark the species of the north; are absent from the species of the south. The species are separable at sight. And the absence of glands on ovary and style makes *Rh. Meddianum* an orderly member of the Thomsoni series in the limited sense.

Of *Rh. eclecereum* Forrest did not collect specimens in full flower so far as his collection shows. He obtained abundant fruit and seed and we shall have therefore the plant in cultivation ere long. The only corollas I have seen are imperfect withered ones on No. 15,298 hanging on some flowers beginning to pass into fruit. The specimen on which these occur is a small one taken out by Forrest from the mass of specimens under this number which now lie at the bottom of the sea somewhere between Britain and China having gone down in a steamer torpedoed during the war. We do not yet know the flower-colour of the plant. The description I have given is open therefore to correction and improvement when perfect flowers are available. Of the distinctness of the species there is no doubt.

***Rhododendron erileucum*,* Balf. f. et Forrest.† (Triflorum.)**

A twiggy shrub as much as 2.7 m. high. Branches of the year about 1 mm. in diameter reddened densely lepidote epilose, a year old as much as 3 mm. with a glaucous bloom from epidermal wax-papillae the peltate scales somewhat wart-like,

* *ἐρίλευκος*, very white—in allusion to the under-side of the foliage leaves.

† *Rhododendron erileucum*, Balf. f. et Forrest.—Frutex ad 2.7 m. altus. Rami homotini rubidi dense lepidoti epilosi ceri-glauci, annotini verruculosi. Alabastra pauca. Folia petiolata ad 7.5 cm. longa; lamina chartacea ovalis vel obovalis

becoming grey before decorticating in subsequent years. No prominent cluster of buds at end of shoots, terminal foliage-bud often alone conspicuous, axils of adjacent leaves usually without large buds, few foliage-buds under the inflorescence elongating; outer scale-leaves crustaceous brown rounded to ovate keeled and more or less mucronate, lepidote and wax-glaucous on back, margin more or less ciliate; inner scale-leaves membranous brown oblong-spathulate about 1.2 cm. long one-nerved obtuse or rounded or truncate lepidote on back sparingly ciliate and setulose on margin top more densely ciliate; juvenile leaves conduplicate-convolute glabrous on upper surface excepting puberulous midrib, lepidote beneath with white seal-like scales and puberulous along midrib and primary veins, margin ciliate and setulose. Leaves petiolate as much as 7.5 cm. long; lamina thinly leathery oval or oboval as much as 7 cm. long 3 cm. broad, shortly acuminate at apex with a pronounced stylar apiculus ending in a red tuberculate hydathode, margin cartilaginous notched at the insertions of fallen setae and hairs, some setulae may persist for a time towards the base, base obtuse; upper surface opaque pale green elepidote, midrib grooved puberulous usually reddened, primary veins about 10 on each side more or less hidden; under surface wax-white covered all over with epidermal wax-bearing papillae, discontinuously lepidote the brown scales with convex umbo and equally broad fringe sometimes overlapped by the wax papillae, distance between the scales greater than diameter of scales which are about 2 in a square mm., midrib raised puberulous sparingly lepidote, primary veins very slightly raised and puberulous; petiole about 5 mm. long red-tinted grooved glaucous and puberulous and lepidote sometimes with a few setae. Inflorescence a 3-4-flowered umbel somewhat immersed within the end-leaves of the shoot; bracts early deciduous, unknown; bracteoles linear throughout or expanded into a spathulate top over 1 cm. long slightly longer than pedicel, only slightly hairy throughout and sparingly lepidote on back at top where is a

breviter acuminata apiculata, margine cartilaginea minute crenulata nunc plus minusve ciliata et setulosa, basi obtusa; supra pallide olivacea glabra (costa media sulcata puberula excepta) venis occultis; subtus albida papillis ceriferis ubique obiecta lepidota squamis spadiceis distantibus, costa media elevata puberula; petiolus ad 5 mm. longus sulcatus puberulus glaucus nunc setulosus. Flores in umbellas 3-4-floras dispositi; bracteolae pedicellis longiores; pedicelli sparsim lepidoti glauci epilosi vix 1 cm. longi. Calyx brevis 1.5 mm. longus lobis 5 minutis rotundatis margine sparsim setulosus et lepidotis. Corolla alba zygomorpha circ. 3.2 cm. longa a basi infundibuliformis late expansa intus puberula, extus puberula et lepidota; lobi 5 elliptici vel ovoides circ. 1.7 cm. longi 2 cm. lati subaequales patentes. Stamina 10 inaequalia corolla breviora; filamenta puberula. Discus puberulus. Gynaecium corolla brevius staminibus longius; ovarium conoideum truncatum lepidotum ad 4 mm. longum; stylus glaber sub stigmatibus lobulato discoideo claviformis.

long bristle-crest; pedicel short usually barely 1 cm. long sometimes a little longer glaucous sparingly lepidote more densely so at expanded top under calyx. Calyx small about 1.5 mm. long with 5 rounded lobes each under 1 mm. in length, lepidote outside the margins of the lobes sparingly setulose and often scale-fringed. Corolla white open butterfly-shaped a little over 3 cm. long; tube funnel-shaped from the base hardly laterally compressed with one shallow median inside groove on the posterior petal scarcely forming a ridge outside, base barely gibbous, puberulous inside, puberulous and lepidote all over outside, expanding into a broad 5-lobed spreading limb; lobes broad elliptic about 1.7 cm. long 2 cm. broad auriculate overlapping subequal. Stamens 10 unequal shorter than corolla, longest about 2.7 cm. long with anther about 3 mm. long, shortest about 1.3 cm. long with anther about 2 mm.; filaments dilated downwards glabrous at very base then puberulous to above the ovary. Disk shortly puberulous. Gynaeceum about 2.8 cm. long shorter than corolla; ovary conoid truncate grooved about 4 mm. long, densely covered with imbricate peltate scales; style glabrous expanding clavately under the broad discoid lobulate stigma.

W. Yunnan. Shweli-Salween divide. Lat. 25° 30' N. Alt. 9000–10,000 ft. Open rocky slopes. Shrub of 6–9 ft. Flowers white. G. Forrest. No. 17,593. May–June 1918.

This species is a near ally of *Rh. zaleucum*, Balf. f. et W. W. Sm. in the Triflorum series, and if it be hardy will be an acquisition as a plant of the garden. *Rh. zaleucum* coming from the same latitude and as low an altitude is hardy and gives hope therefore that *Rh. erileucum* will be so. By its broader oval or oboval shortly acuminate not lanceolate longly acuminate leaves *Rh. erileucum* is readily distinguished from *Rh. zaleucum*. Our specimens show it to be less floriferous than that species and also less inclined to branch freely from below the flower-truss. Most of the shoots show only small subfloral leaf-buds and the trusses are always solitary. The puberulous outside surface of the corolla may also be taken as a conspicuous difference between the species if it be a constant character but of this I am not satisfied. *Rh. erileucum* adds another to the number of species of the Triflorum series known from Western Yunnan where up till now explorers have not shown it to be abundantly represented.

Rhododendron erythrocalyx, Balf. f. et Forrest.* (Selsen.)

Twiggy shrub about 2.5 m. high with thin straight branches about 3 mm. in diameter when a year old, the annual growths

* *Rhododendron erythrocalyx*, Balf. f. et Forrest.—Frutex ad 2.5 m. altus ramulis tenuibus virgatis paucis strictis plus minusve rubro-glandulosis. Alabastra

about 7 cm. long. Branches of the year dark purple densely glandular some long almost setulose glands with stalks orange-coloured the gland ovoid dark red many shorter often nearly sessile globose and ovoid red glands, mixed with glands are occasional red sebaceous hairs, after the first year branches pass through brown to grey (decorticating) and the glands disappear leaving vestigial punctulations. Foliage-buds long fusiform pointed; outer scale-leaves crustaceous brown rounded mucronulate almost glabrous outside the margin shortly ciliate especially at top with greasy short hairs, followed by oblong ones more or less puberulous and floccose outside and with many marginal greasy red hairs clustered particularly at top and around the mucro; innermost scale-leaves long membranous yellow as much as 4.5 cm. long 6 mm. broad with linear-lanceolate lamina acuminate and tapering downwards into a petiole glandular on the back at base and more or less glandular on margin throughout, puberulous on back towards top and with clustered red greasy hairs around the elongated blunt mucro; young foliage-leaves revolute sparingly glandular on upper surface densely covered with orange cauliflower hairs on under surface with some glands on the midrib, petiole densely glandular like stem. Leaves petiolate as much as 12.5 cm. long 5-7 at the extremity of each shoot; lamina thinly leathery oval or elongated oval or oblong-oval, sometimes slightly broader above the middle as much as 10 cm. long 5 cm. broad, apex rounded or obtuse with a beaked tip or an apiculus ending in a rather small red tuberculate hydathode, margin thin cartilaginous obscurely notched through the fallen juvenile glands and hairs, base cordulate; upper surface olive-green mat shagreened glabrous but for vestiges of juvenile glands, midrib grooved, primary veins about 14 on each side slightly grooved; under surface paler covered all over with vestigial cauliflower

fusiformia; perulae extimae coriaceae rotundatae eglandulosae, intimae elongatae ad 4.5 cm. longae 6 mm. latae anguste lanceolatae acutae deorsum in petiolum attenuatae basi dense glandulosae; folia juvenilia revoluta. Folia ad 12.5 cm. longa ramulorum apicem versus 5-7 aggregata; lamina tenuiter coriacea ovalis vel oblonga vel oblongo-ovalis subrostrata, margine cartilaginea obscure crenulata, basi cordulata; supra olivacea glabra sed vestigiis glandularum obscure notata, costa media sulcata; infra pallidior ubique pilis caulifloris oblecta, costa media roseo-tincta elevata; petiolus circ. 2.5 cm. longus rubidus sulcatus plus minusve glandulosus. Umbella terminalis 4-6-flora; pedicelli ad 2.5 cm. longi glandulosi. Calyx ruber circ. 7 mm. longus; cupula carnosula atropurpurea dense glandulosa; lobi 5 circ. 5 mm. longi elongato-triangulares apice rotundati margine glandulosi et sparsissime ciliati utrinque eglandulosi sed pilis caulifloris paucis obscure conspersi. Corolla flavido-alba postice variculosa et maculata aperte campanulata circ. 5 cm. longa intus extusque glabra; lobi 5 rotundati circ. 2.5 cm. longi et lati emarginati. Stamina 10 inaequalia corolla multo breviora; filamenta glabra. Discus glaber. Gynaecium corolla paullo brevius staminibus longius; ovarium cylindrico-conoideum truncatum dense glandulosum; stylus glaber.

hairs, midrib raised pink-tinted with some vestigial glands and cauliflower hairs but glabrescent, primary veins and ultimate venation showing as a very fine faintly red-tinted network; petiole as much as 2.5 cm. long red-tinted grooved above glandular like the stem. Umbels 4-6-flowered terminal; bracts and bracteoles early deciduous unknown; pedicels reddened about 2-2.5 cm. long densely glandular like the stems with long and short glands. Calyx red about 7 mm. long with fleshy darker-coloured cup about 2 mm. long densely glandular outside and 5 elongated triangular persistent lobes about 5 mm. long rounded at top with a glandular margin a few hairs mixed with the glands, eglandular on both surfaces but with a few small white cauliflower hairs. Corolla creamy white with a basal pale crimson blotch posteriorly and some small crimson spots openly campanulate from the base about 5 cm. long glabrous outside and inside; limb broad expanded; lobes 5 rounded as much as 2.5 cm. long and broad emarginate. Stamens 10 shorter than corolla and gynaecium unequal longest about 3.5 cm. long shortest about 2 cm.; filaments widened to the base glabrous (occasionally a hair or two). Disk glabrous. Gynaecium a little shorter than the corolla; ovary cylindric-conoid truncate shallowly grooved densely glandular about 5 mm. long; style glabrous slightly expanding at tip into a lip around the discoid lobulate stigma.

N.W. Yunnan. Bei-ma-shan. Alt. 13,000 ft. Lat. 28° 12' N. Open thickets and pine forests. Shrub of 6-7 ft. Flowers creamy white with a few crimson spots and lines towards base. G. Forrest. No. 13,989. June 1917.

A large-leaved member of the *Selense* series producing large creamy-white flowers with a red glandular calyx and corolla marked by a basal red blotch and small red spots spread widely over the posterior surface—characters which separate it in its series from allied forms.

***Rhododendron fulvoides*, Balf. f. et Forrest.* (Fulvum.)**

Shrub 6 m. high. Branches stout when a year old as much as 7 mm. in diameter densely covered with a brown scurfy whitening indumentum of mop-hairs more or less agglutinated and falling off, the older branches nearly bare of indumentum before

* *Rhododendron fulvoides*, Balf. f. et Forrest.—Frutex 6 m. altus. Rami crassi ad 7 mm. diam. indumento furfuraceo brunneo sed albicante tomentosi. Alabastra subglobosa. Folia petiolata ad 21 cm. longa sub anthesi deflexa; lamina coriacea ad 19 cm. longa 6 cm. lata oblanceolata vel elongato-obovalis, apice rotundata vel obtusa vel subacuta vel breviter acuminata mucronata, margine plana, basi obtusa vel late cuneata; supra olivacea subnitens glabra sed vestigiis indumenti juvenilis nunc notata, costa media et venis primariis (utrin-

decorticating. Foliage-buds enwrapped in a brown tomentum short subglobose nested amidst the leaves the last leaves a little smaller than the others and close up to the bud; outer scale-leaves almost woody from a rounded or ovate basal half or third acuminate tail thick keeled and mucronate, intermediate crustaceous more oblong less tomentose except on margins, innermost somewhat membranous and strap-shaped as much as 3.5 cm. long 3.5 mm. broad acute strongly mucronate and very tomentose about the mucro, finely ciliate throughout; young leaves revolute with upper surface densely floccose glandular. Leaves petiolate as much as 21 cm. long; lamina thickly leathery oblanceolate or elongated oboval as much as 19 cm. long 6 cm. broad, apex rounded or obtuse or subacute or shortly acuminate ending in a red tuberculate mucro, margin cartilaginous plane, base obtuse or broadly wedge-shaped; upper surface olive-green somewhat glossy smooth glabrous hardly showing traces of juvenile indumentum, midrib and primary veins (about 16 on each side) grooved; under surface covered with a brown coarsely granular surface of indumentum appearing as if produced by the cracking of a uniform layer, through the cracks and here and there where rubbed a paler very smooth pellicle seen, the indumentum is bistrate, the upper buff layer of mop-hairs or besom-hairs with long stout many-celled stalks crowned with a dense tuft of short pointed unicellular radiating branches usually curled, near to and on sides of midrib the stalks often very long and wavy, the mops often set in depressions or pits of the leaf-surface, the hairs of the tuft usually reddening and taking on a glandular look, the under stratum consists of similarly formed hairs only with very short or almost no stalks their branches spreading usually uncoloured and somewhat agglutinate to form the pellicle, midrib elevated clad like rest of surface, the primary veins hidden by indumentum; petiole stout grooved about 2 cm. long clad like the stem. Flowers in solitary terminal as many as 20-flowered racemose umbels, rachis up to 1.5 cm. long glabrous;

secus ad 16) sulcatis; subtus brunnea crasse granulosa indumento bistrato e pilis longis et brevibus in modum peniculi capitatim-floccosi constructis vestita; petiolus circ. 2 cm. longus furfuraceo-tomentosus. Flores in racemo-umbellam terminalem circ. 20-floram dispositi, rhachi glabra; inflorescentiae gemma globosa; bracteae exteriores rotundatae glandulosae, interiores sericeae; bracteolae lineares apice spatuliformes circ. 1 cm. longae; pedicelli glabri circ. 2 cm. longi. Calyx minutus circ. 1 mm. longus glaberrimus vix 5-denticulatus. Corolla alba roseo-suffusa variculata et maculata campanulata circ. 3 cm. longa extus intusque glabra; lobi 5 rotundati emarginati circ. 1.3 cm. longi 2 cm. lati. Stamina 10 inaequalia corolla gynaeceoque breviora; filamenta basi subglandulosa et vesiculoso-pilosa. Discus glaber vel sparsissime puberulus. Gynaeceum corollam subaequans; ovarium angustum ad 7 mm. longum truncatum glaberrimum; stylus glaber.

inflorescence-bud globose; outer bracts crustaceous brown rotundate more or less glandular and floccose outside; inner bracts oblong broadly spatulate densely silky outside; bracteoles linear expanded into a spoon-shaped tip, about 1 cm. long, shortly pilose below at top densely pilose and hair-crested; pedicel about 2 cm. long glabrous. Calyx saucer-shaped very small about 1 mm. long most glabrous its margin undulate and showing obscurely 5 teeth or semilunate lobes. Corolla white flushed rose with a large crimson basal blotch and a few spots or lines spreading from it campanulate about 3 cm. long glabrous outside and inside expanding into a 5-lobed open limb; lobes rounded about 1.3 cm. long 2 cm. broad emarginate. Stamens 10 unequal all shorter than corolla and gynaecium; longest about 2.3 cm. long, shortest about 1.3 cm. long; filaments slightly dilated downwards, at the base clad with short vesicular hairs and stalked glands; anthers about 2 mm. long. Disk glabrous or most sparsely puberulous. Gynaecium about 3 cm. long equalling corolla; ovary thin elongated 7 mm. long 1.5 mm. in diameter truncate slightly grooved most glabrous; style glabrous expanded at top into a short lip below the discoid lobulate stigma. Capsule sickle-shaped long and thin as much as 3.5 cm. long 4 mm. in diameter glabrous, style often persistent, dehiscing from apex by 5 valves. Seed pale brown oblong flattened striate about 2.5 mm. long .75 mm. broad with a narrow arillar wing on one side usually and a funicular and chalazal crest.

N.W. Yunnan. Mekong-Salween divide. Lat. 28° 10' N. Alt. 11,000 ft. In mixed thickets and amongst rocks. Shrub of 6-10 ft. In fruit. G. Forrest. No. 13,400. Sept. 1914.

N.W. Yunnan. Mekong-Salween divide. Lat. 28° 10' N. Alt. 11,000 ft. In open forests. Shrub of 15 ft. G. Forrest. No. 13,556. Oct. 1914. [Foliage only.]

S.E. Tibet. Tsarong. Ka-gwr-pw, Mekong-Salween divide. Lat. 28° 25' N. In rhododendron thickets. Shrub of 10 ft. In fruit. G. Forrest. No. 14,988. Oct. 1917.

S.E. Tibet. Tsarong. On Ka-gwr-pw, Mekong-Salween divide. Lat. 28° 25' N. Alt. 12,000 ft. In open thickets. Shrub of 6-9 ft. Flowers rose? In fruit. G. Forrest. No. 14,499. July 1917.

S.E. Tibet. Tsarong. G. Forrest. No. 15,278. Nov. 1917. Duplicate in fruit?

Yunnan. [Without precise locality.] G. Forrest. No. 16,140. Nov. 1917. Duplicate in fruit.

Eastern N.W. Yunnan. Mountains N.E. of Chungtien. Lat. 28° N. Alt. 13,000 ft. In rhododendron thickets. Shrub of 9-12 ft. Flowers creamy rose with a few crimson markings and blotch of deep crimson. G. Forrest. No. 16,515. July 1918.

S.E. Tibet. Tsarong. On Doker-la, Mekong-Salween

divide. Lat. $28^{\circ} 25'$ N. Alt. 12,000–13,000 ft. In pine and rhododendron forest. Shrub of 20 ft. Flowers white flushed rose and with crimson markings running into a deep blotch at base. G. Forrest. No. 16,516. June 1918.

S.E. Tibet. Tsarong. On Kw-gwr-pw, Mekong-Salween divide. Lat. $28^{\circ} 40'$ N. Alt. 12,000 ft. In rhododendron thickets and pine forests. Shrub of 10–15 ft. Flowers pinkish-rose with a few crimson markings at base. G. Forrest. No. 16,720. July 1918. Duplicate of 1917 in fruit.

S.E. Tibet. Tsarong. G. Forrest. No. 16,721. Aug. 1918. Duplicate of 16,720 in fruit.

N.W. Yunnan. Kari Pass, Mekong-Yangtze divide. Lat. $27^{\circ} 40'$ N. Alt. 12,000 ft. Open situations amongst boulders. Shrub of 6–7 ft. In fruit. G. Forrest. No. 12,967. Aug. 1914.

N.W. Yunnan. Kari Pass, Mekong-Yangtze divide. Lat. $27^{\circ} 40'$ N. Alt. 12,000 ft. In open dark forests. Shrub of 15 ft. In fruit. G. Forrest. No. 13,029. Aug. 1914.

The type of the Fulvum series, *Rh. fulvum*, Balf. f. et W. W. Sm. is a plant of the Shweli-Salween divide in latitudes from $25^{\circ} 20'$ N. to $25^{\circ} 30'$ N. as we know of it up till now. This new species *Rh. fulvoides* we must look on as a geographical form of the Fulvum type from the Mekong-Salween divide having a wider range over areas between latitudes $28^{\circ} 10'$ N. and $28^{\circ} 40'$ N. From the Kari Pass on the Mekong-Yangtze divide in lat. $27^{\circ} 40'$ N. Forrest has brought specimens in immature fruit which I do not separate from *Rh. fulvoides*, and on the mountains N.E. of Chungtien in lat. 28° N. close to the Eastern boundary of N.W. Yunnan Forrest found a plant of this phylum which seems to be also this *Rh. fulvoides*. These extensions of the distribution out of the Mekong-Salween divide find a parallel in species of other phyla of Rhododendron and also in other genera.

Rhododendron hemitrichotum,* Balf. f. et Forrest.† (Scabrifolium.)

Small twiggy bush nearly 1 m. high with very thin intricately interlacing softly and shortly downy branchlets, profusely floriferous. Branches a year old about 1 mm. in diameter pink and densely coated with short straight erect soft white hairs intermixed with mushroom-like small peltate scales the disk of

* *ἡμιτριχόστος*, half hairy—in allusion to the disposition of hairiness on leaf-surfaces.

† *Rhododendron hemitrichotum*, Balf. f. et Forrest.—Frutex nanus virgatus ad 1 m. altus. Rami tenues (annotini circ. 1 mm. diam.) pallide rosei puberuli et lepidoti. Alabastra parvula; perulae lepidotae plus minusve arachnoideociliatae. Folia petiolata ad 2.5 cm. longa; lamina coriacea anguste oblonga vel lanceolata, acuta ad 2.2 cm. longa 6 mm. lata, margine revoluta, basi cuneata;

which without fringe is often nearly globular and infiltrated with an orange secretion sometimes reddening at the umbo of the scale, hairs and scales traceable on the dark grey or blackened older branches for many years. Foliage-buds very small ovoid blunt usually invested by one or two reduced foliage-leaves which are about 4 mm. long with lanceolate pointed lamina and vagina equally long; outer scale-leaves thinly crustaceous deciduous at bud-expansion rounded lepidote and puberulous outside and with long curled arachnoid marginal hairs spreading over the bud, a few straight short hairs present about the mucronulate tip; innermost scale-leaves membranous obovate keeled obtuse slightly mucronate about 7 mm. long 2 mm. broad densely lepidote outside finely ciliate; young leaves conduplicate convolute. Leaves shortly petiolate as much as 2.5 cm. long; lamina leathery narrowly oblong or lanceolate sometimes a little wider above the middle, about 2.2 cm. long, 6 mm. broad acute with a short red mucro, margin cartilaginous recurved, base wedge-shaped; upper surface pale olive-green mat with a grooved midrib and all over persistently puberulous with soft short hairs which do not harden to form asperities near the margin, primary veins invisible; under surface grey-white with a raised pink-tinted sparsely puberulous elepidote (or with an occasional scale) midrib, the rest of the surface on which primary veins do not show lepidote with small discontiguous orange-coloured scales having short stalk and convex swollen disk without fringe sunk in pits to depth of half of the disk, distance between scales slightly greater than or about equal to diameter of scales which are some 9 to the sq. mm. sometimes in groups touching one another, epidermal papillae in intervals between scales large rod-like; petiole about 3 mm. long grooved puberulous and lepidote. Flowers disposed in 2-3-flowered umbels which are axillary to the last fully developed leaves on the shoots, 3-4 umbels forming a cluster at the end of each shoot which ends in a vegetative bud; bracts persistent under the flowers; outer bracts crustaceous rounded puberulous and ciliate outside the margin with long woolly spreading hairs mixed with short

supra convexa pallide olivacea opaca ubique puberula elepidota; subtus albo-grisea papillis epidermicis ceriferis vestita pilosa (costa media elevata sparsim puberula excepta) et squamis peltatis discontiguis stipitatis subglobosis (sine instita) aurantiacis in foveis profundis inclusis obsita; petiolus circ. 3 mm. longus pallide roseus lepidotus et puberulus. Umbellae 2-3-florae omnes axillares circum ramulorum apicem 3-4-fasciculatae; bracteae persistentes pilosae et lepidotae; bracteolae filiformes apiceque expansae pedicellis longiores; pedicelli rubri circ. 6 mm. longi puberuli et lepidoti. Calyx minutus vix 1 mm. longus lepidotus et puberulus. Corolla pallide rosea circ. 1.3 cm. longa; tubus infundibuliformis intus glaber; lobi 5 oblongo-ovales circ. 7 mm. longi 4 mm. lati extus lepidoti. Stamina 10 inaequalia, longissima corollam paullo superantia; filamenta puberula. Discus glaber. Gynaecium corolla longius circ. 1.5 cm. longum; ovarium parvum circ. 2 mm. longum puberulum et lepidotum; stylus glaber ruber.

straight ones, inner fertile bracts obovate spathulate apex rounded with broad base about 6 mm. long 3 mm. broad puberulous and lepidote outside with long woolly marginal hairs mixed with short ones; bracteoles longer than pedicels and calyx about 8 mm. long filiform below and glabrous at base pilose upwards and expanded at end into an oval limb woolly and lepidote; pedicels short 6 mm. long sometimes longer to about 8 mm. red lepidote and puberulous. Calyx minute not 1 mm. long red lepidote and puberulous outside the rim undulate or with five indications of rounded lobation, the lobes ciliate with short hairs a few long ones mixed with them. Corolla pale rose margined a deeper shade about 1.3 cm. long slightly shorter than longest stamens and gynaecium with a short funnel-shaped tube glabrous inside expanding into an erect 5-lobed limb; lobes oblong-oval about 7 mm. long 4 mm. broad lepidote outside. Stamens 10 unequal longest just exceeding the corolla, shortest barely 1 cm. long; filaments filiform glabrous at very base finely puberulous above that to mouth of corolla-tube. Disk glabrous. Gynaecium about 1.5 cm. long longer than corolla and stamens; ovary small barely 2 mm. long conoid truncate lepidote and puberulous; style filiform glabrous pink with a very small lobulate stigma.

S.W. Szechwan. Mu-li Mountains. Valley of the Litang River. Lat. $28^{\circ} 12' N$. Alt. 12,000 ft. Open rocky pasture. Shrub of 2-3 ft. Flowers pale rose margined a deeper shade. G. Forrest. No. 16,250. June 1918.

Rh. hemitrichotum is a plant of the facies of *Rh. mollicomum*, Balf. f. et W. W. Sm. and is a more northerly development of the same phylum in the *Scabrifolium* series. It may be at once recognised by the white under side of the foliage-leaves—the coloration is due to wax-coloured elongated rod-like papillae—and the absence of hairs on this surface except for a few on the midrib. In *Rh. mollicomum* the surface is green and downy. The features exhibited by the peltate scales deserve notice. These scales on the leaf under side have stout stalks and the disk is ovoid transversely to the stalk, sometimes almost globular. There is no fringe. The scales are sunk in deep pits so that only about half of the disk is above the surface.

Rhododendron hormophorum,* Balf. f. et Forrest.† (Triflorum.)

A woody small shrub or undershrub some 4 dm. high with thick woody underground or prostrate rooting stems forming

* *δρμος*, necklace—in allusion to the circlet of bead-like scales around the calyx-rim.

† *Rhododendron hormophorum*, Balf. f. et Forrest.—Suffrutescens ad 4 dm. altum ramulis plurimis a caulibus subterraneis vel prostratis orientibus. Ramuli

crowns from which many short branches ascend. Aerial branches about 3 mm. in diameter the bark becoming grey and cracking in the third year usually. Twigs of the year very thin barely 1 mm. in diameter reddened finely puberulous and sparingly lepidote with white seal-like peltate scales distant or in groups, the scales falling from older twigs some remaining and blackening, the puberulousness persistent until decortication. Foliage-buds small ovate; outer scale-leaves crustaceous rounded obtuse glabrous outside, except at the tip which is finely hair-ciliate, puberulous more or less inside; innermost scale-leaves pale greenish or yellowish membranous spatulate-ligulate somewhat acute carried up on elongating axis lepidote outside margin more or less setulose; juvenile leaves conduplicate-convolute densely setulose and puberulous and with a few peltate scales on upper surface, densely lepidote underneath with a puberulous midrib, margin densely setulose-ciliate, petiole grooved puberulous more or less lepidote and setulose-ciliate. Leaves petiolate as much as 4.5 cm. long; lamina thin papery lanceolate or oblong or narrowly oblong-oval as much as 4.2 cm. long 1.5 cm. broad acute or obtuse and ending in a prominent apiculus with rounded tuberculate terminal red hydathode, margin plane not cartilaginous regularly and finely ciliate somewhat setulose towards base, base cuneate tapered into the short petiole; upper surface mat olive-green smooth puberulous and distantly lepidote and setulose, the scales white flat seal-like with broad umbo and narrower entire fringe intervals between scales much greater than diameter of scale, about 2 or 3 scales in a square mm., midrib reddened lepidote and setulose, primary veins very thin immersed reddened about 7 on each side of midrib; under surface slightly paler lepidote with distant scales like the upper surface, esetulose and epilose except on raised reddened midrib which has very short hairs, primary veins and ultimate venation reddened; petiole 2-3 mm. long finely puberulous sparingly

hornotini tenues vix 1 mm. diam. puberuli et discontigue albo-lepidoti, annotini ad 3 mm. diam. Folia breviter petiolata ad 4.5 cm. longa; lamina tenuis papyracea lanceolata vel oblonga vel oblongo-ovalis acuta vel obtusa apiculata, margine plana haud cartilaginea ciliata et setulosa, basi cuneata; supra opaca olivacea puberula et setulosa et lepidota squamulis distantibus; subtus pallidior albo-lepidota squamis sigilliformibus distantibus, esetulosa et epilosa (costa media elevata excepta); petiolus 2-3 mm. longus puberulus et setulosus sparsim lepidotus. Umbellae 3-5-florae; bracteolae pedicellis breviores dorso lepidotae; pedicelli vix 1 cm. longi pilosi sparsim lepidoti. Calycis limbus undulatus parvulus margine squamis albis cinctus. Corolla zygomorpha circ. 3 cm. longa rosea brunneo-maculata, extus lepidota et puberula, intus puberula; lobi 5 subaequales oblongi vel oblongo-ovati. Stamina 10 inaequalia corolla paullo breviora; filamenta ad basim glabra supra usque ad os corollinum puberula. Discus puberulus. Gynaecium corolla paullo longius; ovarium cylindricum truncatum dense lepidotum; stylus ruber glaber sub stigmate discoideo lobulato in labium parvum circulare expansus.

lepidote and setulose. Flowers in 3-5-flowered terminal umbels; bracts soon deciduous, unknown; bracteoles short about 5 mm. long about .5 mm. broad strap-shaped lepidote outside, pilose and setulose on margin, hair-crested; pedicels barely 1 cm. long strict divergent epilose sparingly lepidote reddened slightly expanded below the calyx. Calyx an undulate rim the protuberances fringed by large white peltate scales forming a conspicuous necklace-like ring below the corolla-tube. Corolla butterfly-shaped rose-coloured with brown spots posteriorly, about 3 cm. long puberulous inside, outside finely puberulous and with a few distant scattered white peltate scales; tube short apparently darker than limb thin slightly compressed with a median ridge on back of posterior petal and corresponding groove inside otherwise not conspicuously grooved; 5 lobes unequal antero-lateral longer and narrower, posterior 1.5 cm. long 1 cm. broad, oblong-oval or ovate obtuse often somewhat undulate. Stamens 10 unequal nearly equalling corolla, longest about 1.8 cm. long, shortest about 1.2 cm. long; anthers small ovoid about 2 mm. long; filaments dilated at base and there glabrous over about 2 mm., puberulous above to mouth of corolla-tube. Disk more or less puberulous. Gynaecium longer than stamens and corolla about 3.3 cm. long; ovary cylindric truncate grooved about 3.5 mm. long entirely covered by white imbricate peltate scales sometimes a few hairs at the top amongst the scales; style red glabrous slightly swollen below the discoid lobulate stigma to which it forms a narrow crimson lip.

S.W. Szechwan. Mu-li Mountains. Valley of the Litang. Lat. 28° 12' N. Alt. 11,000 ft. Open dry stony pasture. Shrub of 10-18 inches. Flowers rose with brown markings. Forrest. No. 16,265. June 1918.

So many of the members of the Triflorum series are distinguished one from the other by characters which, easily recognisable in the living plant, lose prominence in the dried specimen, that it is refreshing to have in this new species from S.W. Szechwan a plant of which dried specimens pronounce at once specific differentiation. *Rh. hormophorum* belongs within the Triflorum series to the set including *Rh. chartophyllum*, Franch. and *Rh. yunnanense*, Franch. It is a plant the habit of which is in consonance with its described habitat—dry stony alpine pasture. Its stem appears to ramify in the soil under the stones, rooting and forming crowns from which aerial short shoots ascend, bare below and producing small tufts of leaves and trusses of flowers at the top. The community of such plants must form a scrub about a foot and a half high after the fashion of old heather on a moor. The hairy bristly leaves have the hairs and bristles on the upper surface, whilst the under side has neither (excepting

the midrib). Then the hair-cilia and bristles of the margin are most regularly placed. The peltate scales are about equally distributed on the upper and under surfaces, and these, as on the stems and elsewhere where they occur, have the form of flat white disks recalling rather those of the *Heliolepis* series than of the *Triflorums*. In the flower the calyx gives a diagnostic mark utilised for the name of the species in the white peltate scales disposed close-set along the rim of the lobes forming a white necklace-like band around the base of the corolla which is finely puberulous all over outside. As a plant of cultivation *Rh. hormophorum* is likely to be hardy but does not give evidence of greater or less attractiveness than many others of its series.

***Rhododendron hypophaeum*,* Balf. f. et Forrest.† (Triflorum.)**

A shrub about 1.5 m. high with thin branches of short annual growths divaricating pseudo-dichotomously to form zigzag axes. Twigs a year old about 1 mm. in diameter (after 8 years some 4 mm. only) finely puberulous and lepidote distantly with orange-coloured small scales, older twigs blackish-grey. Foliage-buds not clustered on either vegetative or flower shoots small narrowly ovoid about 5 mm. long; outer scale-leaves crustaceous rounded

* *ὀψοφαίος*, somewhat grey—in allusion to the colour of foliage.

† *Rhododendron hypophaeum*, Balf. f. et Forrest.—Frutex ad 1.5 m. altus. Rami graciles divaricatim patentes minute puberuli lepidoti demum cinerascetes. Alabastra anguste ovoidea parva; perulae exteriores rotundatae vel late ovatae carinatae mucronulataeque extus sparsim puberulae ubique lepidotae ciliatae. Folia petiolata ad 6 cm. longa; lamina chartacea lanceolata vel ovali-lanceolata acuta, margine cartilaginea, basi late cuneata; supra olivacea opaca laevis discontigue lepidota et sparsim puberula, costa media sulcata puberula, nervis primariis utrinsecus circ. 7 fere occultis; subtus pallidior griseo-viridis copiose lepidota squamis discontiguis aurantiaco-brunneis, costa media straminea puberula lepidota, nervis primariis et venis ultimis leviter prominulis; petiolus circ. 5 mm. longus sulcatus puberulus et lepidotus. Umbellae 3-4-florae solitariae terminales vel 2-3-fasciculatae; bracteae exteriores rotundatae crustaceae lepidotae et albo-ciliatae, intimae fertiles oblongo-spathulatae vel subobovatae 1 cm. longae 6 mm. latae basi membranaceae erectae supra reflexae cucullatae extus lepidotae; bracteolae lineares pedicellis longiores lepidotae et pilo-cristatae; pedicelli 8 mm. longi copiose lepidoti pilosi. Calyx parvus circ. 1.5 mm. longus 5-lobus extus basi lepidotus; lobi membranacei rotundati ciliati circ. 1 mm. longi. Corolla alba roseotincta zygomorpha circ. 2 cm. longa extus elepidota pilosa intus puberula; tubus infundibuliformis lateraliter compressus postice bisulcatus in limbum apertum 5-lobum ampliatus; lobi subaequales circ. 1 cm. longi oblongo-ovales undulati. Stamina 10 inaequalia, longiora corollam aequantia brevissimum circ. 1 cm. longum; filamenta puberula; antherae purpureo-tinctae. Discus puberulus. Gynaecium corolla multo longius circ. 2.7 cm. longum; ovarium parvum 2 mm. longum conoideum truncatum lepidotum; stylus validus glaber vel ad basim pilos paucos gerens sub stigmate haud dilatatus; stigma parvum. Capsula cylindrica circ. 1 cm. longa 3 mm. diam. lepidota.

or broadly ovate keeled mucronate sparingly puberulous outside and there lepidote all over, ciliate. Leaves petiolate as much as 6 cm. long; lamina chartaceous lanceolate or oval-lanceolate acute, margin cartilaginous plane, base broadly cuneate; upper surface mat olive-green smooth sparingly puberulous and discontinuously lepidote with small orange-brown scales showing a convex umbo and narrow uncoloured fringe, distance between the scales greater than diameter of scales which are about 7 in a sq. mm., midrib grooved puberulous, primary veins about 7 on each side straight hardly visible; under surface much paler grey-green with a pale yellow raised epilose lepidote midrib and the whole surface (dry) showing a slightly raised reticulation of venation, lepidote with orange-brown discontinuous scales separated usually by more than diameter of scale, scales about 10 in a sq. mm. rather larger than those of upper surface and with concave umbo; petiole about 5 mm. long straw-coloured lepidote and puberulous. Inflorescence a solitary terminal 3-4-flowered umbel; outer bracts rounded crustaceous lepidote outside ciliate, innermost bracts broadly spatulate about 1 cm. long 6 mm. broad reflexing outwards and downwards from middle lower half membranous broad upper half more crustaceous hooded and embossed outwards as a convex surface lepidote outside with incurved membranous margins; bracteoles about 1.2 cm. long longer than pedicels filiform below club-shaped above pilose throughout lepidote on back above, white hair-crested; pedicels short as much as 8 mm. long strict lepidote the pale yellow scales in groups epilose. Calyx small about 1.5 mm. long; cup about .5 mm. long lepidote outside 5-lobed; lobes often somewhat unequal about 1 mm. long rounded membranous above and ciliate hardly lepidote outside. Corolla white faintly tinged rose butterfly-shaped small about 2 cm. long, glabrous outside, finely puberulous towards base inside; tube compressed and grooved on each side of midrib of posterior petal correspondingly ridged inside expanding into a funnel-shaped 5-lobed limb; lobes oblong-oval undulate about 1 cm. long 7 mm. broad half the length of the whole corolla half-spreading. Stamens 10 unequal, longest about 2 cm. long equalling the corolla with anther 2 mm. long, shortest 1 cm. long gripped in the posterior corolline groove with anther 1 mm. long; filaments dilated downwards to the base which is glabrous over about 2 mm., puberulous above within the corolla-tube; anthers violet-tinted. Disk puberulous. Gynaecium about 2.7 cm. long much longer than corolla and stamens; ovary small about 2 mm. long conoid truncate lepidote; style glabrous or with a few basal hairs, of equal diameter throughout not enlarged at tip and carrying a

small lobulate stigma at the centre of its extremity. Capsule about 1 cm. long 3 mm. in diameter dehiscent to base by 5 valves.

S.W. Szechwan. Mountains around Mu-li, valley of the Litang River. Lat. $28^{\circ} 12' N$. Alt. 11,000 ft. Open situations in and on the margins of pine forests. Shrub of 4–5 ft. Flowers white faintly tinged rose. G. Forrest. No. 16,249. June 1918.

Rh. hypophaeum is one of the small-flowered species of the Triflorum series, using that designation in its widest sense. Its nearest allies are *Rh. longistylum*, Rehd. et Wilson and *Rh. Hanceanum*, Hemsl.—two of Wilson's species from Szechwan, and both known in wild specimens in an imperfect condition. They are common plants now in cultivation and their features in living specimens are well known. *Rh. hypophaeum* is easily distinguished from both these species by its less leathery leaves smooth not rugulose on the upper surface and with closer-set scales on the under surface. Then the inflorescence is a few-flowered umbel solitary and terminal whilst in the species named the inflorescence is essentially racemose with many flowers although where there are only a few flowers the umbellate form appears.

Rhododendron Jenestierianum,* G. Forrest.† (Campylogynum.)

A stiffly branched shrub reaching 2 cm. in height with few straight divaricating thin branches simulating dichotomies. Twigs of the year purple with a glaucous bloom about 1.5 mm. in diameter, glabrous but occasionally a yellow discoid scintillating scale visible; a year old 2.5 mm. in diameter pale brown or grey not decorticating until the third or fourth year. Mature buds not seen; innermost scale-leaves membranous brown more or less carried up on elongating shoot, spatulate the uppermost petiolate 2.5–3 cm. long 8 mm. broad obtuse spar-

* To Père Jenestier of the French R.C. Tibetan Mission, Tsiedjong, Upper Mekong, I am indebted for much help freely rendered.—G. FORREST.

† *Rhododendron Jenestierianum*, G. Forrest.—Frutex ad 2 m. altus. Ramuli annotini glabri circ. 3 mm. diam. Folia petiolata ad 16.5 cm. longa; lamina papyracea lanceolata vel oblanceolata saepe curvata, apice breviter acuminata, margine integra, basi cuneata inaequalis; supra pallide viridis subnitens glabra (costa media puberula excepta); infra pallidior squamis peltatis scintillantibus distantibus conspersa et papillis ceriferis glauca, costa media venisque primariis prominulis; petiolus circ. 1.5 cm. longus. Flores subpenduli in racemos dispositi, rhachi glabra; pedicelli circ. 2.5 cm. longi plus minusve atropurpurei et ceriferi squamis paucis conspersi. Calyx cupuliformis circ. 3 mm. longus glaber rubropurpureus margine nunc integer nunc inaequaliter lobatus. Corolla campanulata atropurpurea cerifera glabra circ. 1.7 cm. longa. Stamina 8 corollam subaequantia; filamenta glabra crassa aurantiaca. Discus atropurpureus. Gynaeceum staminibus brevius; ovarium petasiforme lepidotum; stylus glaber deflexus ovarium dimidio superans, apice clavatus.

ingly lepidote outside from base upwards with yellow scintillating fleshy scales with a discoid summit, somewhat silky at top outside and inside and with a hair-crest, most minutely and shortly ciliate. Leaves in fives or sixes at the end of the twigs petiolate as much as 16.5 cm. long; lamina thin papery lanceolate or slightly oblanceolate sometimes laterally curved narrowed to both ends, apex shortly acuminate ending in a small inconspicuous hydathode, margin entire finely cartilaginous, base more or less wedge-shaped or obtuse often unequal; upper surface pale light green smooth slightly glossy with wax coating, in adult state glabrous but for a few hairs in the grooved midrib, primary veins about 16 on each side inconspicuous; under surface grey-green sprinkled with far distant small yellowish scintillating peltate scales each with a narrow umbo and broad sharply circular thick fringe the stalk sunk in surface pit, the intermediate areas clad with large wax-covered papillae which make a somewhat glistening surface and give the grey look to the surface, midrib and primary veins prominent straw-coloured the former obscurely puberulous; petiole grooved about 1.5 cm. long furfuraceous on upper surface glabrous underneath with an occasional peltate scale. Inflorescence an erect projecting small raceme of some 10-12 spreading somewhat drooping flowers, rhachis about 2.5 cm. long glabrous purple somewhat glaucous with wax; fertile bracts obovate leathery spatulate about 1.5 cm. long 8 mm. broad somewhat truncate mucronate densely lepidote and puberulous on back finely ciliate hair-crested; bracteoles linear strap-shaped a little wider at top about 1.5 cm. long, sparingly pilose throughout and sparingly lepidote outside in upper half hair-crested; pedicels about 2.5 cm. long more or less plum-coloured and with a glaucous bloom especially towards top where expanded under the calyx, glabrous but for a few scattered yellowish or whitish circular scales. Calyx a shallow fleshy cup about 3 mm. long plum-coloured with a glaucous bloom glabrous, margin thinner slightly reddened entire or obscurely undulate or unequally lobed somewhat spreading. Corolla campanulate fleshy plum-purple coloured about 1.7 cm. long with a glaucous bloom glabrous inside and outside; tube about 5 mm. wide at base and there paler-coloured; limb 5-lobed the lobes oval rounded at tip undulate 9 mm. long 7 mm. broad recurving at expansion. Stamens 8 alternately long and short, the short only slightly shorter, about equalling the corolla in length; filaments stout fleshy purple-red or bright crimson, not dilated downwards, glabrous; anthers purplish-red or bright crimson oblong large about 2 mm. long. Disk glabrous deep purple. Gynaecium shorter than stamens; ovary dome-shaped

grooved about 3 mm. long lepidote with almost contiguous cake-like scales; style stout glabrous deflexed about half again as long as ovary broadly clavate at the top and forming a flat-lipped disk to the lobulate stigma. Capsule small ovoid about 6 mm. long 5 mm. in diameter ash-grey with remains of scales and subtended by the withered calyx, dehiscing from apex by 5 valves. Seeds most minute brown fusiform.

N.E. Upper Burma. N'Maikha-Salween divide, Salween flank. Lat. 26° to $26^{\circ} 8'$ N. Alt. 11,000–12,000 ft. On the margins of forests, in cane brakes and on open rocky slopes. Shrub of 4–6 ft. Flowers plum-purple with a glaucous bloom. Anthers and filaments clear purplish-red or bright crimson. G. Forrest. No. 17,824. April 1919. Duplicate in fruit No. 18,329. Aug. 1919.

A charming plant with flowers recalling in appearance and construction those of some forms of the aggregate species *Rh. campylogynum*, Franch. But that is a dwarf species with small leaves and flowers on long pedicels solitary and terminal or in 3–4-flowered terminal trusses in which the stamens have hairy filaments. Here we have a large-leaved plant with refined foliage of a delicate grey-green tint and trusses of many flowers projected well above the leaves. Altogether a distinct species much to be desired for our gardens.

***Rhododendron lepidostylum*, Balf. f. et Forrest.* (Trichocladum.)**

Shrub with short thin annual branches, those of the year about 1 mm. in diameter densely hispid with bristle-hairs and lepidote beneath them with white stalked scales without fringe, bristles and vestiges of scales persisting more or less until decortication of the dark dirty-grey coloured cortex. Scale-leaves of the foliage-buds persisting for two years at least at the base

* *Rhododendron lepidostylum*, Balf. f. et Forrest.—Frutex ramulis brevibus tenuibus dense hispidis et lepidotis. Alabastrorum perulae plus minusve persistentes. Folia biennia petiolata ad 4.5 cm. longa; lamina tenuiter coriacea ovalis vel obovalis ad 4 cm. longa 1.7 cm. lata, apice rotundata breviter mucronata, margine setulosa, basi obtusa vel rotundata; supra olivacea opaca glaberrima; subtus pallidior subglaucia ubique plus minusve setulosa et discontigue lepidota; petioli circ. 5 mm. longus hispidus et lepidotus. Flores in umbellam 2-floram terminalem dispositi; bracteae perulis similes; bracteolae lineari-clavatae circ. 1 cm. longae superne lepidotae et setulosae; pedicelli ad 3 cm. longi lepidoti et setulosi. Calyx circ. 7 mm. longus 5-partitus; lobi oblongi vel lanceolati obtusi vel acuti lepidoti et dense setulosi. Corolla flava maculata obliqua circ. 2.5 cm. longa extus puberula et lepidota, intus puberula, 5-loba; lobi inaequales rotundati vel ovals integri. Stamina brevissima supra basim villosa. Discus glaber. Gynaecium corolla paullo longius; ovarium breve truncatum circ. 4 mm. longum dense lepidotum et setulosum; stylus lepidotus ovario longior.

of the successive annual shoots; outer scale-leaves brown crustaceous keeled and mucronulate glabrous outside, intermediate longer oblong shortly ciliate densely lepidote outside, innermost greenish somewhat membranous narrowly oblong-oval obtuse and ciliate carried up on elongating shoot. Leaves of a year present when those of succeeding year are developed, petiolate as much as 4.5 cm. long; lamina thinly leathery oval or oboval as much as 4 cm. long 1.7 cm. broad, apex obtuse or rounded with short conspicuous red tuberculate mucro, margin setulose, base obtuse or rounded; upper surface olive-green mat with grooved midrib and primary veins about 8 on each side hidden most glabrous; under surface paler somewhat glaucous setulose all over copiously on the raised pinkish midrib (primary veins concealed) also densely lepidote with brown infiltrated superficial discontinuous concave nearly uniform scales without conspicuous fringe the distance between the scales less than or occasionally slightly more than diameter of scales about 4-5 scales in a sq. mm.; petiole about 5 mm. long clad like the stem. Flowers in a 2-flowered terminal umbel; bracts quite like the scale-leaves of the foliage-buds; bracteoles linear-clavate a little more than 1 cm. long lepidote towards top and setulose; pedicels as much as 3 cm. long green lepidote and bristly expanded into a cup below the calyx. Calyx large longer than ovary about 7 mm. long cut to the base into 5 green lobes; lobes unequal oblong or lanceolate obtuse or acute lepidote with large white scales outside and densely setulose all over back and margin. Corolla yellow spotted copiously posteriorly oblique about 2.5 cm. long, puberulous and lepidote outside, puberulous inside; tube in front short about 5 mm. long expanding into a broad limb with 5 unequal lobes, posterior lobe smallest rounded about 1 cm. long and broad, antero-lateral elongated oval about 1.5 cm. long 8 mm. broad entire. Shortest stamens about 1 cm. long; filaments stout villous some distance above the base. Disk glabrous. Gynaeceum over 2.5 cm. long; ovary short thick cylindric truncate about 4 mm. long, shorter than the style densely lepidote with white scales and setulose with many bristles those at top forming a crest encircling base of style; style thin delicate epilose more or less lepidote.

W. Yunnan. Summit of the Jangtzw Shan, Shweli-Salween divide. Lat. $25^{\circ} 15'$ N. Alt. 11,000-11,500 ft. Open exposed situations on cliffs. Shrub of 1 ft. Flowers pale yellow. G. Forrest. No. 18,143. June 1919. Rare.

Another and very distinct member of the *Trichocladum* series distinguished readily from other species of the series by the longer calyx, the ovary clad with bristles in addition to scales and the lepidote style. The material that has come home so far has only

been in postal packet and is not adequate for full description ; what I have said of the species above will require therefore some emendation when better material arrives.

Rhododendron litiense,* Balf. f. et Forrest.† (Souliei.)

Shrub as much as 2.5 m. high with medium thick branches usually straight. Branches of the year densely glandular with short-stalked ovoid red fleshy glands, year-old branches about 3 mm. in diameter glabrescent showing usually traces of the glands. Foliage-buds fusiform ; outer scale-leaves crustaceous rounded ovate becoming oblong or oblong ovate keeled shortly apiculate, on the back densely puberulous with adpressed hairs which often redden and become greasy, margin ciliate with white often reddening branched hairs ; innermost scale-leaves membranous yellow brown ligulate-spathulate about 3 cm. long 6 mm. broad at top acute more or less puberulous outside ; young leaves revolute, the upper surface more or less sprinkled with stalked red glands and some floccose fasciate or rosette hairs all early deciduous, under surface clad with many cauliflower hairs and glands, petiole glandular with sessile glands underneath and stalked glands on margin and above where also are some floccose hairs. Leaves petiolate as much as 9 cm. long ; lamina thinly coriaceous oblong or oblong-oval as much as 7.5 cm. long 3 cm. broad slightly narrowed at top obtuse with a short apiculus ending in a tubercular horny hydathode, margin plane thinly cartilaginous, base trunculate or shallowly cordulate ; upper surface mat green shagreened, midrib shallowly

* Liti, in Yunnan, in the vicinity of which the plant was discovered.

† *Rhododendron litiense*, Balf. f. et Forrest.—Frutex ad 2.5 m. altus. Rami hornotini dense rubro-glandulosi, annotini circ. 3 mm. diam. glabrescentes. Alabastrorum perulae extimae dorso puberulae margine piloso-ciliatae, intimae ligulato-spathulatae extus puberulae. Folia petiolata ad 9 cm. longa ; lamina tenuiter coriacea oblonga vel oblongo-ovalis, apice paullo angustata apiculata mucronata, margine tenuiter cartilaginea plana, basi trunculata vel subcordulata ; supra opaca viridis glabra sed vestigiis glandularum juvenilium notata, costa media venisque primariis paullo elevatis erubescens ; subtus glauca papillis epidermicis ceriferis vestita et pilis caulifloris glandulisque conspersa, costa media rubida glandularum vestigiis verruculosa ; petiolus ad 1.5 cm. longus plus minusve glabrescens sed glandularum vestigia gerens. Flores in umbellam 5-6-floram brevissime racemosam dispositi, rhachi sparsim glandulosa et floccosa ; bractee intimae extus intusque sericeae ; bracteolae circ. 7 mm. longae sparsim pilosae superne glandulosae ; pedicelli stricti ad 1.5 cm. longi glandulosi. Calyx foliaceus flavidus circ. 7 mm. longus ; cupula sparsim glandulosa ; lobi 5 inaequales dorso fere eglandulosi margine glanduloso-ciliati. Corolla lutea vix 3 cm. longa campanulata carnosula extus glabra ; lobi circ. 1.3 cm. longi 2 cm. lati paullo emarginati. Stamina 10 inaequalia corolla gynaeceoque breviora ; filamenta haud deorsum expansa glabra. Discus puberulus. Gynaeceum corolla brevius stamina subaequans ; ovarium circ. 4 mm. longum conoideum truncatum glandulosum glandulis longe stipitatis ; stylus glandulosus, glandulis breviter stipitatis.

grooved, primary veins about 12 on each side also shallowly grooved, the whole surface glabrous even in the midrib groove, only a trace of the juvenile glands here and there visible; under surface glaucous with a wax bloom often purpling covered with close-set low dome-shaped wax-secreting epidermal papillae and sprinkled with short cauliflower hairs and red glands, the midrib red and raised and faintly warted with remains of glands, the primary veins red and also slightly raised; petiole as much as 1.5 cm. long reddening grooved on upper side glabrescent but showing traces of the juvenile sessile glands on under side and stalked ones upper side. Inflorescence a terminal 5-6-flowered very shortly racemose umbel, rhachis about 7 mm. long sparingly glandular and floccose; flowers in bud orange-red; bracts falling as inflorescence expands, inner ones oblong spatulate rounded at top with a short mucro silky outside and inside; bracteoles linear widening upwards and then tapered to the point about 7 mm. long .35 mm. broad shorter than pedicels sparingly hairy from base and towards top glandular, apex ending in a bristle; pedicels strict somewhat unequal as much as 1.5 cm. long glandular with stalked red glands expanding under the calyx. Calyx foliaceous yellowish about 7 mm. long; cup about 1 mm. long flat sparingly glandular outside, lobes elliptic or oblong unequal posterior pair largest as much as 6 mm. long 3 mm. broad almost eglandular on back regularly gland-ciliate at margin. Corolla yellow without blotch or spots barely 3 cm. long campanulate from base fleshy glabrous outside and inside, gibbous and retuse at base especially on posterior side; lobes short and broad about 1.3 cm. long 2 cm. broad undulate and slightly emarginate. Stamens 10 unequal much shorter than corolla, longest about 1.9 cm. long with anther 3 mm. long, shortest about 1 cm. long with anther 1.5 mm. long; filaments stout white not expanded, downwards glabrous; anthers bright brown. Disk dark green puberulous below ovary. Gynaeceum about 2 cm. long shorter than corolla about equalling longest stamens; ovary about 4 mm. long thick conoid truncate grooved glandular with red ovoid glands on long stout ascending stalks; style glandular throughout the glands shortly stalked, expanding into a clavate tip forming a prominent lip below the broad lobulate discoid stigma.

Yunnan. On the Li-ti-ping. Lat. 27° 12' N. Alt. 9000-10,000 ft. Shrub of 6-9 ft. In shady forests. Flowers yellow, orange-red in bud. G. Forrest. No. 13,922. June 1917.

A plant of the Souliei series and of the alliance of *Rh. Wardii*, W. W. Sm. and *Rh. croceum*, Balf. f. et W. W. Sm., distinguished from both of them by the white-grey of the purpling under-surface of the leaves. It has not the glands on the outside of the

corolla of *Rh. croceum* nor the nearly sessile and sessile glands of the ovary of *Rh. Wardii*.

The plant in unripe fruit gathered by Forrest in 1914 on the Kari Pass and referred to *Rh. croceum* * may perhaps be this species.

Rhododendron Macabeanum,† Watt MS.‡ (Grande.)

Tree as much as 15 m. high with short stem and brown bark and bearing twisted more or less whorled ascending branches forming a crowded dome. Branches thick when a year old about 7.5 mm. in diameter densely tomentose with a chestnut-brown indumentum, eglandular. Foliage-buds large oblong with imbricate scales as is typical of the Grande series; scale-leaves eglandular the outermost ovate acuminate-caudate more or less tomentose; intermediate rounded emarginate without tomentum; innermost chestnut-brown or reddish. Leaves large petiolate as much as 30 cm. long in rosettes of 4–5 at end of branches; lamina thickly leathery oblong-elliptic or somewhat rounded as much as 27 cm. long 18 cm. broad, apex rounded emarginate with a stiff mucro, margin cartilaginous somewhat flat, towards the base narrowed somewhat truncately obtuse; upper surface dark green shagreened with a grooved midrib and about 14 impressed primary veins on each side, glabrous or sprinkled with vestiges of juvenile tomentum; under surface at first white or greyish-white somewhat glossy clad with a compact smooth

* Notes R.B.G. Edin., x (1917), 95.

† See p. 129 for explanation.

‡ *Rhododendron Macabeanum*, Watt MS.—Arbor ad 15 m. alta trunco brevi corticeque brunneo. Ramuli crassi annotini circ. 7.5 mm. diam. dense spadiceo-tomentosi eglandulosi. Alabastra magna oblonga eglandulosa. Folia magna petiolata ad 30 cm. longa; lamina crasse coriacea oblongo-elliptica vel subrotundata ad 27 cm. longa 18 cm. lata, apice rotundata emarginata rigide mucronata, margine cartilaginea subplana, basim versus attenuata truncatim obtusa; supra atroviridis haud rugulosa glabra vel vestigiis tomenti juvenilis conspersa, costa media sulcata, venis primariis utrinsecus circ. 14 impressis; subtus primo albida indumenti strato uniformi compacto laevi subnitente vestita, postea opaca saepe sordida plus minusve lanato-tomentosa, costa media venisque primariis elevatis; petiolus crassus circ. 2.5 cm. longus plus minusve tomentosus. Flores plurimi in umbellam compactam magnam 10 cm. diam. aggregati; bractee late ovatae vel rotundatae, steriles coriaceae emarginatae extus glabrae, fertiles abrupte acuminatee rubrae extus intusque sericeae; pedicelli validi breves circ. 1.5 cm. longi albido-tomentosi eglandulosi sub calyce oblique expansi. Calyx vix evoluitus lobis irregularibus minutissimis tomentosis. Corolla laete flava vel flavido-alba a basi angusta late tubuloso-campanulata circ. 5 cm. longa; tubus intus varo magno striisque purpureis basim versus notatus circ. 3.5 cm. longus basi gibbosus; lobi 8 rotundati circ. 2 cm. lati emarginati undulati. Stamina 16 inclusa; filamenta glabra; antherae brunneae. Gynaeceum corolla brevius; ovarium pilis albidis fasciatis compactis tomentosum; stylus glaber tenuis; stigma coccineum magnum discoideum undulatum. Capsula leviter curvata ad 4 cm. longa 1.5 cm. lata plus minusve tomentosa.

uniform layer of indumentum of long stalked hairs with many intertwining thread-like branches later opaque often becoming blackish and more or less woolly tomentose on the surface through the spreading of the tree-like branches of the indumentum hairs, midrib and primary veins prominent; petiole thick about 2.5 cm. long more or less tomentose. Flowers very many in a compact umbel 10 cm. in diameter; bracts broadly ovate or rounded, outermost leathery emarginate glabrous outside, inner ones abruptly acuminate reddened silky outside and inside; pedicels stout short about 1.5 cm. long whitely tomentose eglandular very obliquely expanded below the calyx. Calyx almost obsolete with irregular lobulation tomentose. Corolla pale yellow or yellowish white tubular-campanulate from a narrow base about 5 cm. long; tube with large purple spots at base and purple striae about 3 cm. long pouched at base; lobes 8 short imbricate rounded about 2 cm. broad emarginate undulate. Stamens 16 shorter than corolla; filaments glabrous; anthers brown. Gynaecium shorter than corolla; ovary tomentose with white compact fasciate hairs; style glabrous slender; stigma large scarlet undulate. Capsule slightly curved about 4 cm. long 1.5 cm. in diameter more or less tomentose, dehiscent by four compound separating valves each bearing 4 chambers.

Manipur. Japvo, Naga Hills. Alt. 8000-9500 ft. A large tree covered with leaves only on the extremities of the ultimate branches. Leaves a foot or more long broad obtuse apiculate densely woolly below and white or with age becoming black. Leaf-buds oblong with broad oval emarginate scales. Flower-buds round as large as the fist with the inner bracts suddenly apiculate or acuminate. Flowers large pale yellow not spotted. Peduncle half inch long white hairy. Calyx a ring angled but having white hairs. Corolla crumpled with 8 short broad undulate petals the bottom of tube with deep brown streaks. Stamens 16 opening in the deep brown anthers by large terminal pores from which the pollen exudes in long strings sticking together. Style terminal. Stigma large flat undulated scarlet. Ovary covered with white wool. Named in honour of Mr. M'Cabe, the Deputy Commissioner who organised this excursion as many others through his district. Watt. No. 6212. March 9, 1882.

Manipur. Ching Sow. Alt. 8500 ft. Branched distorted tree. Bark brown. Stem with annular swellings a foot apart. Flowers yellow forming large heads. Fruit bursting into 4 patches with gill-like plates. Leaves large woolly below in whorls of 4 to 5 on ultimates of branches. Watt. No. 6511. April 16, 1882.

Manipur. Japvo summit. Alt. 9800 ft. *Rhododendron*

found with fruit below, but a few in flower at summit; former collected. Large balls of flowers yellow white. Young leaves erect white woolly below with large red bracts and scales forming a curious feature of vegetation at this season. Watt. No. 6892. May 18, 1882.

Manipur. Japvo, Naga Hills. Alt. 8000–9500 ft. Regathered by my friend Dr. Conry, who reports that it was quite out of flower in July, also *Rh. Elliottii*—just three specimens in flower. Leaves densely and softly tomentose or lanate. This seems to me a remarkable form the leaves being much more elliptic than in the Sikkim plant. Named in honour of the Deputy Commissioner, Naga Hills, who accompanied me on my first trip to the Naga Hills. Watt. No. 7334. July 22, 1882. [Mr. McCabe was subsequently killed in the great earthquake.—G. W., 1915.]

In Sir George Watt's Herbarium are four sheets of specimens of this *Rhododendron* collected by him in Manipur, and which he regarded as a variety of *Rh. Falconeri*, Hook. f. and named var. *Macabeanum*. It differs from *Rh. Falconeri*, Hook. f. in a degree too great to allow of our looking upon it as a form of that species. Prominent differences are:—The leaves want the cordate base, the indumentum is composed of branching stalked hairs not of cyathiform scales, the pedicels and ovary are tomentose and altogether deficient in glands. The plant is much more closely related to *Rh. grande*, Wight (the relationship was recognised by Sir George Watt: see his interesting and prescient comments quoted on pp. 131–32), but is not identical with that species, differing in the broader leaves, in their ultimately lanate indumentum, in the eglandular tomentose short pedicels and ovary. As a distinct species of the Grande series of *Rhododendrons* *Rh. Macabeanum*, Watt is of special interest as a connecting link between the Sikkim and Bhutan *Rh. grande*, Hook. f. and the Eastern Burmese and Yunnan *Rh. sinogrande*, Balf. f. et W. W. Sm. To *Rh. sinogrande*, Balf. f. et W. W. Sm. its resemblance is greater than to *Rh. grande*, Wight, but the smaller leaves, the longer hairs of the indumentum ultimately making the under surface of the leaves woolly, and the shortly stalked flowers making a compact umbel are easily observed diagnostic marks.

Sir George tells me that in the early eighties of last century he sent home in manuscript descriptions of this and other species along with his Manipur collections which were made use of to some extent by Mr. C. B. Clarke for his paper "On the Plants of Kohima and Manipur," published in the Journal of the Linnean Society, xxv (1890). The novelties of Dr. Watt's collecting which had not been collected also by Mr. Clarke were not

included in the Linnean paper, and therefore some interesting Manipur forms of *Rhododendron* have been unnoticed up till now of which this is one. Sir George Watt has sent to me his MS. of 1883 dealing with *Rh. Macabeanum*, Watt, and I give its story here for an account of the species written shortly after observation of it in its native habitat :—

"*Rhododendron Falconeri*, Hook. fil., var. *Macabeanum*, nov.; leaves elliptic not cordate nor obtuse but tapering, under surface densely coated with long white soft felt; flowers nearly twice as large as in the type form of *Falconeri*, beautiful bright yellow (instead of creamy white) with large purple spots at the base and ascending streaks; stigma large bright scarlet (not green) and undulated.

"Japvo and the Barrail Range in the Naga Hills, and Ching Sow and the higher Burmah-Manipur hills. Alt. 8000–9000 feet, forming dense brushwoods often covering entirely the summits of hills (*i.e.* summit of Japvo, etc.), rarely scattered through other forests as in Sikkim but often associated with bushy *Rhododendrons*.

"A tree 40 to 50 feet in height with short stem soon branching into more or less whorled ascending branches forming a crowded dome. Stem and branches having every foot or so isolated annular swellings with a central groove as if they had been formerly compressed and distorted by a climber. Leaves large spreading in whorls of 4 to 5 not rough and granularly ferruginous felted below (as in *Falconeri*) but matted with delicate soft white wool changing into a beautiful fulvous and ultimately with age becoming quite black. Seedlings glabrous and brown-coloured below, the felt commencing upon the veins of the 3rd and 4th leaves and gradually spreading over the entire surface.* Leaf-buds large erect $\frac{1}{2}$ foot long embraced by long bright brown or red scales elongating and producing their leaves in May immediately after the flowers have fallen. Flowers 2 inch long and $1\frac{1}{2}$ broad quite tubular with 8 short imbricating broad undulate or crumpled and emarginate lobes. Bracts broad ovate acuminate much shorter and more caducous than in *Falconeri*. Stamens 16, anthers brown opening by terminal pores and discharging masses of white pollen grains. Stigma large undulated, scarlet. Ovary coated with white hairs as are also the pedicels. Fruit 16-valved bursting into 4 plates lined by the gill-like valves.

* Sir George Watt here notes a feature in the life of *Rhododendrons* which has been generally overlooked by observers, namely, the late appearance of indumentum upon the young plants, and its gradual spread over the surface in successive leaves until the adult form shows the complete covering from the first. (See Bot. Soc. Trans. Edin., xxvii (1917), 222.)

"I have been at a loss to know whether this remarkably handsome tree should be regarded as distinct from *Falconeri* or not. Having gathered the latter plant only a few months ago in Sikkim I had no doubt in my mind whatever when I came across *Macabeanum* on Japvo that it was quite distinct. The dried specimens, however, approach each other so very much that I have considered it advisable for the present to regard it as but a variety of Hooker's Sikkim plant which he named in honour of the late Dr. Falconer.

"The discovery of *Falconeri* or a nearly allied form so far away from Sikkim must be viewed as a most interesting addition to our knowledge of the Himalayan vegetation. An addition which renews the ever-deepening feeling of disappointment at the want of interest taken in Botanical Science in India. Whether this curious tree of which Sir Joseph Hooker remarks, 'It is the most striking and distinct of the genus,' has been spread from East Nepal and from the neighbourhood of Tonglo in West Sikkim eastward through the vast and practically unexplored Bhotan Himalayas, to the Naga Hills, must remain a problem for the future to solve. We know now, however, that a most interesting plant discovered in 1849, and which down to the present date has been considered as confined to an extremely limited area on the Singaleelah Range (in Sikkim and Nepal), has its home in the Naga Hills and the lofty Burmah-Manipur mountains forming alpine forests on numerous peaks within an area of over 3000 square miles.

"Griffith during his exploration of a portion of Bhotan brought to light a large number of extremely interesting plants which have practically been lost to Science. Most of these have never since been rediscovered, of which *R. grande* is of interest as being probably a form of *Falconeri*, which may prove the link of connection with *Macabeanum* and help to explain the remarkable distribution of *Falconeri*. Like *grande* the new species which I have named *Kingianum* is also nearly allied to *Falconeri*, connecting these with *argenteum* and *Hodgsoni*, and we may thus fairly expect to find that not only are the Naga Hills and the Northern Burmah-Manipur mountains the true home of *Falconeri*, but of the series to which we shall have to add other names besides *grande* and *Macabeanum* and *Kingianum*."

Rhododendron Mackenzianum,* G. Forrest.† (Stamineum.)

Shrub or tree as much as 12 m. high with red bole about 4 dm. in diameter and flaking bark ultimate branchlets straight

* To my friend Miss M'Kenzie of Rangoon.—G. FORREST.

† *Rhododendron Mackenzianum*, G. Forrest.—Frutex vel arbor ad 12 m. altus ramis virgatis annotinis griseis glabris circ. 2 mm. diam. vetustioribus

one or two at each branching annual growths 1 dm. more or less in length about 2 mm. in diameter when a year old glabrous, with white-grey bark not thickening much for some years distinctly nodulose at end of each year's growth. Foliage-buds elongated narrowly ovoid pointed with many scale-leaves, the outer short ovate imbricate each slightly puberulous on back and with a slightly denticulate margin the denticules sometimes glandular-mucronulate and densely white puberulous around the mucro, intermediate scale-leaves elongated oblong acute, innermost scale-leaves dark brown submembranous narrowly elongated lanceolate acuminate as much as 3 cm. long 6 mm. broad slightly puberulous outside the margin ciliate at base then towards apex denticulate and at tip densely clad with interwoven hairs often nearly glabrous; young leaves revolute most glabrous. Leaves petiolate as much as 15 cm. long in a cluster of 5-7 at the end of the naked annual growth; lamina of parchment consistence lanceolate acuminate as much as 13 cm. long 4 cm. broad, terminated by an apiculate mucro, margin white finely cartilaginous, base cuneate; upper surface bright green glossy most glabrous midrib grooved slightly pink-tinted, primary veins many pinnately disposed as many as 16 on each side; under surface paler green mat most glabrous the pink-tinted midrib prominent the primary veins very slightly raised; petiole about 1 cm. long grooved pink-tinted most glabrous. Flowers strongly fragrant arranged in a fascicle of 1-flowered inflorescences at end of shoot surrounding a terminal vegetative bud, each partial inflorescence axillary the pedicel of its flower enclosed during flowering by the persistent scale-leaves of the flower-bud and by its persistent prophylls; flower-bud slightly sticky elongated pointed like the vegetative bud; outermost sterile bracts somewhat crustaceous ovate or ovate-rounded

nodulosus. *Alabastra elongata acuta pluri-perulata subglutinosa.* Folia petiolata ad 15 cm. longa ad apicem ramulorum 5-7-aggregata; lamina pergamentacea lanceolata acuminata ad 13 cm. longa 4 cm. lata mucronata, margine albo-cartilaginea, basi cuneata; supra laetevirens nitens glaberrima costa media sulcata; subtus pallidior opaca glaberrima costa media pallide rosea elevata; petiolus circ. 1 cm. longus glaberrimus roseo-tinctus. Flores fragrantissimi in axillis foliorum ad apicem ramulorum alabastrum vegetativum gerentium fasciculati; quaeque inflorescentia lateralis uniflora bracteis plurimis sub anthesi persistentibus cincta; bractee extimae perulis similes striatae puberulae, intimae submembranaceae obovato-spathulatae ultra 2 cm. longae acutae cucullatae margine denticulato-glandulosae; pedicelli virides glaberrimi circ. 2.5 cm. longi. Calyx carnosulus minutus glaber. Corolla carnosula lilacino-rosea postice viridivarosa infundibuliformis ad 6.5 cm. longa extus intusque glabra; tubi pars inferior angusta 3 cm. longa supra in limbum concavum ampliata; lobi 5 rotundati ad 3 cm. longi. Stamina 10 inaequalia; filamenta basim versus minute puberula. Discus viridis glaber. Gynaeceum corollam subaequans; ovarium tenue cylindricum sursum paullo attenuatum truncatum glabrum circ. 1 cm. longum; stylus glaber; stigma discoideum latum lobulatum.

grey-brown longitudinally striate obtuse or acute densely puberulous outside, intermediate elongated oblong or oval, innermost membranous obovate-spathulate acute over 2 cm. long broader above about 7 mm. across and there cucullate puberulous outside, margin denticulate and glandular and with white hair-cilia at top; bracteoles persistent as long as the innermost bracts membranous narrowly lanceolate above on a strap-shaped stalk half as long as whole bracteole, glandular denticulate in upper half and shortly hair-crested; pedicels stout thick about 2.5 cm. long most glabrous dark green not dilated below the calyx. Calyx fleshy dark-coloured glabrous not 1 cm. long with an undulate lip. Corolla fleshy lilac-pink with green blotch posteriorly as much as 6.5 cm. long with a long funnel-shaped tube half the length of the corolla expanding into a concave more open hardly spreading 5-lobed limb, glabrous both outside and inside; lobes of the limb broad rounded as much as 3 cm. long 2.5 cm. broad. Stamens 10 unequal aggregated around the style slightly longer than the narrow portion of corolla-tube; filaments shortly puberulous towards the base. Disk dark green glabrous. Gynaeceum about as long as the corolla; ovary thin dark green about 1 cm. long cylindric but narrowed to the truncate top glabrous; style long glabrous tip upward turned ending in a broad discoid lobulate stigma.

W. Yunnan. Shweli-Salween divide. Lat. 25° N. Alt. 10,000 ft. In dense mixed and pine forest. Shrub of 12–20 ft. Flowers fleshy, white, flushed rose slightly exterior, interior lower base green; strongly fragrant. G. Forrest. No. 16,111. April 1918.

W. Yunnan. Shweli-Salween divide. Lat. 25° N. Alt. 9000 ft. In thickets and mixed forests. Shrub of 8–16 ft. Flowers fragrant, soft purplish-rose, deepest in bud, with tints of carmine in it and with a greenish-yellow blotch on under side interior towards base. G. Forrest. No. 17,819.

W. Yunnan. Western flank of the N'Maikha-Salween divide. Lat. 26° N. Alt. 9000–10,000 ft. In open thickets. Flowers rose, tube very deep purple blotched yellowish-green, fragrant. G. Forrest. No. 17,832.

N.E. Burma. Hpyepatt Pass. Langyang Pass. Hpimaw. Alt. 7500 ft. Open places of the forest. Forms a fine tree with a bare bold bole like a Scots pine but red with flaking bark. Can attain 40 ft. with diameter of 15 inches. Very floriferous in solid rounded masses of blossoms in full beauty at Hpimaw by April 6. Flowers very pale lilac pink with deeper centre and brownish tinge in throat of upper segment, and intensely fragrant. Purpled exterior of tube showing through. R. Farrer. No. 801. April 6, 1919.

Rh. Mackenzianum belongs to a group of *Rhododendrons* characterised by straight yearly growths often of some length, the very glabrous leaves produced in a rosette at the end of each yearly growth persisting for two or more years and thus false whorls of leaves clothe the branches; flowers produced in lateral trusses fascicled at the end of the shoots around a terminal vegetative bud; corolla with a narrow funnel-shaped base and a 5-lobed limb, the lobes usually half the length of the whole corolla; stamens with thin filaments; ovary long narrow ending in a long usually exserted style. Several species have been described which show more or less the characters named. They are:—

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| <i>Rh. Cavaleriei</i> , Lévl. | Kweichow: Pinfa. |
| <i>Rh. Chaffanjonii</i> , Lévl. | Kweichow: Kouy Yang. |
| <i>Rh. Esquirolii</i> , Lévl. | Kweichow: Gan Chouen. |
| <i>Rh. Feddei</i> , Lévl. | Kweichow: Pinfa. |
| <i>Rh. Hancockii</i> , Hemsl. | S. Yunnan: Mengtsz. |
| <i>Rh. Henryi</i> , Hance. | Kwantung: North River. |
| <i>Rh. Latoucheae</i> , Franch. | Fokien: Kuatun. |
| <i>Rh. Mackenzianum</i> , G. Forrest. | W. Yunnan, N.E. Upper Burma. |
| <i>Rh. moulmeinense</i> , Hook. | Lower Burma: Moulmein. |
| <i>Rh. nematocalyx</i> , Balf. f. et W. W. Sm. | W. Yunnan: Hills N. of Teng-yueh. |
| <i>Rh. oxyphyllum</i> , Franch. | S. Yunnan: between Muongle and Keu-ma-tsi. |
| <i>Rh. pitto-sporae-folium</i> , Hemsl. | W. Hupeh: Patung district. |
| <i>Rh. siamense</i> , Diels. | Siam: Doi Sutep. |
| <i>Rh. stamineum</i> , Franch. | N.E. Yunnan: Tchong-fong-chan. |
| <i>Rh. stenaulum</i> , Balf. f. et W. W. Sm. | W. Yunnan: Divide between Pui-piao and Yung Chang valleys. |
| <i>Rh. Tutcheræ</i> , Hemsl. et Wils. | S. Yunnan: Mengtsz. |
| <i>Rh. Westlandii</i> , Hemsl. | Kwantung: Lantao Island. |
| <i>Rh. Wilsonæ</i> , Hemsl. et Wils. | Hupeh. |

There will be several new species to add to this list when the material collected by Forrest and others has been fully worked up. I hope to be able soon to publish an account of the group, when the limitations and relationships of the species will be discussed.

No one of the members of this group is likely to be a hardy species. It is essentially one of Central and South China, of N.E. Upper Burma, and of S. Burma. *Rh. Mackenzianum* is one of the most beautiful and is allied to *Rh. stenaulum*, but distinguishable by its bright green very glossy foliage, the narrower leaves with long acuminate points, the shorter pedicels and larger flowers. In the *Gardeners' Chronicle*, Ser. 3, lxxv. (1919), 302, Mr. Farrer describes and figures the plant under his field number 801.

Rhododendron Meddianum,* G. Forrest.† (Thomsoni.)

Shrub barely 2 m. high with stout branches. Branches of the year stiff purple with glaucous bloom glabrous about 3 mm. in diameter, year-old branches about 6 mm. in diameter brown becoming ash-grey before decortication. Foliage-bud ovoid pointed not nested; outermost bud-scales half-foliage the base rounded reddened the upper half or less green like foliage; intermediate rounded from acuminate to acute and mucronate slightly keeled glabrous outside finely white-ciliate; innermost scales within the bud not sticky, at expansion carried up on the elongating shoot, petiolate; young leaves in bud revolute. Leaves petiolate as much as 12 cm. long; lamina thickly leathery oval or oblong-oval or oblong sometimes a little broader above the middle as much as 10 cm. long 4.5 cm. broad apex rounded somewhat trunculate or retuse with a thick tuberculate mucro, margin cartilaginous, base obtuse or rounded not cordulate; upper surface ash-grey with a thin pellicle of wax removable by a solvent (such as benzole) when there is exposed a green foveolate surface, midrib slightly pink and shallowly grooved, primary veins some 10-12 on each side slightly prominent; under surface bronzed green glabrous, midrib and primary veins pink and raised, older leaves showing a raised ultimate reticulum of venation (perhaps result of drying); petiole broad as much as 2 cm. long glaucous and purple glabrous grooved above. Inflorescence a 5-7-flowered terminal umbel; innermost bracts red-brown membranous broadly spatulate as much as 3.5 cm. long 1 cm. broad whitely ciliate; bracteoles filiform as long as the pedicels glabrous but for a long white hair-crest; pedicels about 1 cm. long stout glabrous reddish expanding into the

* In compliment to George Medd, Esq., Agent I.F. Company, Bhamo, Upper Burma, to whom I am indebted for much assistance.—G. FORREST.

† *Rhododendron Meddianum*, G. Forrest.—Frutex vix 2 m. altus. Rami hornotini glauco-purpurei eglandulosi, annotini circ. 6 mm. diam. epunctulati. Alabastra roseo-tincta perulis ciliatis. Folia petiolata ad 12 cm. longa; lamina ovalis vel oblongo-ovalis vel oblonga ad 10 cm. longa 4.5 cm. lata apice rotundata mucronata, margine cartilaginea, basi obtusa vel rotundata; supra grisea ceræ pellicula vestita; subtus aeneo-viridis glaberrima costa media venisque primariis erubrescentibus; petiolus ad 2 cm. longus ruber glaberrimus. Flores in umbellam 5-7-floram dispositi; bracteae intimae submembranaceae late spatulatae ciliatae; bracteolae filiformes pedicellos aequantes pilo-cristatae; pedicelli circ. 1 cm. longi validi glauco-purpurei glaberrimi. Calyx ad 6 mm. longus cupularis ultra medium 5-partitus extus glaber; lobi rotundati glabri sub fructu aucti. Corolla tubuloso-campanulata postice maculata variculataque carnosula 5-loba; lobi rotundati lati emarginati 1.5 cm. longi 2.5 cm. lati. Stamina 10 inaequalia corolla breviora; filamenta glabra. Discus glaber. Gynaeceum corolla paullo brevius; ovarium conoideum truncatum sulcatum glaberrimum; stylus glaber. Capsula cylindrica circ. 2 cm. longa 7 mm. diam. glaberrima. Semina pallida complanata elongata circ. 3 mm. longa.

dark cup of the calyx. Calyx conspicuous crimson cup-shaped about 6 mm. long glabrous fleshy 5-lobed; lobes about twice length of cup subequal rounded as much as 7 mm. broad entire or slightly denticulate glabrous. Corolla tubular-campanulate about 6 cm. long fleshy deep crimson with many dark oblong spots on posterior three petals and a darker almost median blotch on middle one glabrous inside and outside; tube at the base 5-pouched retuse, pouches dark crimson inside separated by 5 imperfect interpetaline folds, expanding above into a broad 5-lobed limb; lobes rounded emarginate crenulate about 1.5 cm. long 2.5 cm. broad. Stamens 10 unequal shorter than corolla, longest about 4 cm. long reaching to base of corolla-lobes with dark anther about 3 mm. long, shortest about 2 cm. long with anther about 2 mm.; filaments pale yellow (?) widened to base glabrous. Disk glabrous. Gynaeceum about equal to or a little shorter than corolla longer than stamens; ovary about 5 mm. long conoid truncate grooved glabrous; style glabrous slightly expanded at apex below the narrow lobulate stigma. Capsule cylindric slightly curved about 2 cm. long, 7 mm. in diameter glabrous slightly glaucous more or less encircled by the reddened enlarged somewhat hardened persistent calyx dehiscing from apex by 5 valves. Seeds pale brown flattened striate oblong about 3 mm. long winged and with a crest at each end.

W. Yunnan. Shweli-Salween divide. Lat. 25° 20' N. Alt. 10,000–11,000 ft. Open rhododendron scrub. Shrub of 4–6 ft. Flowers deep crimson fleshy. G. Forrest. No. 15,767. June 1917.

Yunnan. Without precise locality. Duplicate in fruit. G. Forrest. No. 16,037. Nov. 1917.

W. Yunnan. Shweli-Salween divide. Lat. 25° 30' N. Alt. 10,000–11,000 ft. Duplicate of 1917. G. Forrest. No. 17,703. June 1918.

W. Yunnan. Without precise locality. Duplicate in fruit. G. Forrest. No. 17,729. Oct. 1918.

A splendid plant of the Thomsoni series. Forrest obtained abundance of seed and the plant will be therefore soon in cultivation. Under *Rh. eclectum*, Balf. f. et Forrest (see p. 108), which is the nearest ally of our species, I have pointed out that *Rh. Meddianum* may be regarded as a southern representative of the phylum which appears in the north as *Rh. eclectum*. First observation is apt to lead to the opinion that the two species are more alike than they really are, and this because in both the upper surface of the somewhat similarly shaped foliage-leaves is clad with a grey pellicle of wax and this catches the eye at once. The differences

between them are, however, many and the more prominent are tabulated here:—

Rh. Meddianum.
Young stems eglandular.
Foliage-buds not nest-buds not sticky inside, perulae ciliate.
Foliage-leaves more oval and oblong not markedly obovate, obtuse or rounded at base.
Inflorescence a 5-7-flowered umbel.
Pedicels about 1 cm. long.
Ovary glabrous.

Rh. eclesteum.
Young stems glandular.
Foliage-buds nest-buds very sticky inside, perulae eciliate.
Foliage-leaves obovate (pear outline) occasionally oblong, cordulate at base.
Inflorescence a 12- or more-flowered racemose umbel.
Pedicels 2 cm. long.
Ovary glandular.

Of the first series of specimens collected by Forrest of this plant all save a few, reserved as duplicate forms from the sending to Europe, were lost in a steamer which was torpedoed on the way home.

Rhododendron megaphyllum, Balf. f. et Forrest.* (Falconeri.)

Robust shrub as much as 9 m. high with stout branches. Branches a year old 1 cm. or more in diameter surface brown tomentose, the tomentum persisting more or less for several years. Foliage-buds unknown. Leaves petiolate as much as 20 cm. long; lamina obovate sometimes approaching elliptic but always wider above the middle often fiddle-shaped narrower or broader as much as 18 cm. long 12 cm. broad, apex often recurved rounded sometimes subtruncate slightly emarginate the sinus occupied by a rounded red tuberculate mucro, margin broadly cartilaginous entire not recurved or slightly so, base wedge-shaped or obtuse or rounded sometimes showing an abrupt narrowing towards the base prolonged as a narrow wing

* *Rhododendron megaphyllum*, Balf. f. et Forrest.—Frutex robustus ad 9 m. altus. Rami crassi annotini tomentosi demum glabrescentes. Folia petiolata ad 20 cm. longa; lamina crasse coriacea plus minusve obovata ad 18 cm. longa 12 cm. lata, apice rotundata emarginata, margine cartilaginea, basi cuneata vel rotundata; supra atroviridis rugulosa indumenti juvenilis vestigiis sordidis conspersa; subtus rufo-tomentosa indumento bistrato discolore induta, strati superi pilis poculiformibus haud fimbriatis deciduis vel persistentibus, inferi pilis rosulatis pelliculam albidam aedificantibus; petiolus ad 2.5 cm. longus haud sulcatus. Flores in racemo-umbellam circ. 20-floram dispositi rhachi tomentosa; bracteae exteriores rotundatae viscidiae, intimae fertiles oblongo-obovatae vel spatulatae sericeae; bracteolae breves circ. 5 mm. longae; pedicelli tomentosi ad 4 cm. longi sub fructu elongati. Calyx minutus 8-dentatus. Corolla flava basi rubro-variculosa oblique campanulata 8-loba. Stamina 16 corolla gynaeceoque breviora. Discus glaber. Gynaeceum corolla brevius; ovarium ovoideum 10-11-loculare pilis fasciatis dense tomentosum; stylus sub stigmate discoideo late clavatus. Capsula curvata pilis spadiceis plus minusve vestita. Semina complanata arillata.

along the petiole; upper surface dark green mat somewhat rugulose and shagreened, midrib raised at base slightly grooved upwards, primary veins 12 or a few more on each side slightly grooved spreading from midrib at an obtuse angle often approaching a right angle curving slightly upwards, surface especially midrib and veins showing greyish vestiges of a juvenile cobwebbed indumentum; under surface cinnamon-brown the midrib raised black-purple, the primary veins also raised, the whole surface clad with a bistrate indumentum, the upper stratum of cup-shaped stalked brown hairs with a bell-shaped base to the cup, the stalk stout many-celled, the cup-walls of isodiametric cells, the margin prolonged into a few acuminate lobes not fringed, midrib usually devoid of these cup-hairs, the whole stratum persistent or more or less deciduous, the under stratum of rosette white hairs with short stalks and vesicular branches agglutinating into a crustaceous skin under the upper stratum and becoming exposed as a grey-white surface if the upper stratum falls; petiole as much as 2.5 cm. long cylindric not grooved coated with indumentum like the stem the under white stratum persisting more or less, slightly winged by the decurrent lamina. Inflorescence a racemose umbel with brown tomentose rhachis about 3 cm. long, flowers as many as 20 in the truss, flower-bud globose; bracts outer sterile ones nearly rotundate thick often thinner at margin leathery imbricate, inner fertile bracts oblong or oblong-spathulate or obovate-spathulate rounded towards top and apiculate outside densely coarsely silky, inside finely silky towards the top; bracteoles linear very short about 5 mm. long densely pilose outside and hair-crested; pedicels somewhat unequal as much as 4 cm. long elongating in fruit densely clothed with a pinkish woolly indumentum of much branched long interlocking hairs, swollen at top below the calyx and there oblique. Calyx very small densely clad like the pedicel showing 8 very short triangular teeth. Corolla yellow with crimson or rose base obliquely campanulate the posterior side convex slightly longer as much as 4.5 cm. long set on obliquely nearly at right angles to axis of pedicel; tube very slightly pouched at base glabrous inside and outside; limb 8-lobed; lobes imbricate short and broad about 8 mm. long 1.4 cm. broad emarginate. Stamens 16 unequal, shorter than corolla and gynaecium, longest about 2.5 cm. long, shortest about 1.8 cm. long; filaments slightly widened at base glabrous; anthers elliptic about 3.5 mm. long. Disk glabrous. Gynaecium about 3 cm. long a little shorter than corolla on its anterior side; ovary ovoid truncate about 8 cm. long grooved 10-11-locular eglandular enwrapped in a pinkish thick soft woolly tomentum of compactly arranged fasciate hairs, the stalks of the hairs long many-celled, the

branches thick-walled unicellular pointed; style glabrous much dilated below the lobulate broad discoid stigma. Capsule cylindric slightly sickle-shaped about 2 cm. long 1 cm. in diameter more or less clad with bright brown fasciate hairs, dehiscent by valves of 1 or more carpels. Seeds flat dark brown oblong as much as 3 mm. long 1 mm. across with a lateral wing-areol, a large chalazal membranous crest, the funicular end only slightly produced often pointed.

W. Yunnan. Shweli-Salween divide. Lat. 25° 30' N. Alt. 11,000 ft. In rhododendron forest. Shrub of 10–20 ft. Flowers yellow with a faint flush of rose at base. G. Forrest. No. 17,650. June 1918.

W. Yunnan. Shweli-Salween divide. Lat. 25° 20' N. Alt. 11,000 ft. In rhododendron forest. Shrub of 30 ft. Flowers yellow tinged crimson at base. G. Forrest. No. 17,678. June 1918.

W. Yunnan. Shweli-Salween divide. Alt. 11,000 ft. Duplicate of 1912–17. G. Forrest. No. 17,691. May 1918.

Yunnan. Duplicate in fruit. G. Forrest. No. 16,036. Nov. 1917.

Yunnan. Duplicate in fruit. G. Forrest. No. 17,769. Oct. 1918.

A species of the Falconeri series nearly allied to *Rh. basilicum*, Balf. f. et W. W. Sm., from which its smaller leaves campanulate slightly fringed not funnel-shaped fringed cup-hairs of the indumentum of the under-leaf surface and the 10–11-locular not 13–15-locular ovary distinguish it. Capsule only about 2 cm. long not 4 cm.

Like *Rh. basilicum* it has a persistent cinnamon-coloured indumentum, the surface of which is somewhat spongy, showing the mouths of the funnel-shaped cup-hairs embedded in the few short marginal branches of the cup. The cup-hairs readily separate not being held together by an interlacing of branch hairs.

Rhododendron megeratum,* Balf. f. et Forrest.† (Boothii.)

Shrub about half a metre high with straight at first red then chestnut-brown coloured branches of short annual growths

* *μεγίστος*, passing lovely.

† *Rhododendron megeratum*, Balf. f. et Forrest.—Frutex nanus ad .5 m. altus. Rami stricti laete brunnei tenues annotini circ. 1.5 mm. diam. dense setulosi elepidoti, perulis persistentibus plus minusve vestiti. Folia petiolata ad 4 cm. longa; lamina coriacea ovalis ad 3.3 cm. longa vix 2 cm. lata, obtusa mucrone decurvo, margine cartilaginea plus minusve setulosa recurva, basi rotundata vel subtrunculata; supra laete viridis glabra subnitens; subtus griseo-alba papillis ceriferis baculiformibus vestita et squamulis aurantiacis scintillantibus inaequalibus in foveis depressis discontigue lepidota; petiolus rubescens circ. 7 mm.

about 3 cm. long occasionally showing longer virgate shoots. Branches of the year densely bristly lepidote yet with here and there a scale, about 1.5 mm. in diameter girt at the base by persistent outer brown scale-leaves, older twigs becoming blackish grey and decorticating in third or fourth year, the outer foliage-bud-scales persisting and marking base of successive annual growths for two or three years. Foliage-buds small ovoid; outermost scale-leaves broadly ovate or rounded-oval crustaceous sparingly lepidote outside keeled mucronulate, margin densely whitely ciliate at top; intermediate scale-leaves more oblong; innermost scale-leaves membranous carried up on elongating shoots oblong-oval pointed about 1.5 cm. long 6 mm. broad sparingly lepidote and sticky outside more or less setulose, young leaves conduplicate-convolute. Leaves petiolate as much as 4 cm. long persistent for two or more years; lamina leathery oval or oblong-oval as much as 3.3 cm. long under 2 cm. broad obtuse with a short deflexed tuberculate greenish-yellow mucro, margin thickly cartilaginous recurved usually bristly or crenulate from scars of fallen bristles, base rounded or somewhat truncate; upper surface bright green somewhat glossy obscurely coarsely shagreened, midrib grooved glabrous except at very base where puberulous and with a few bristles, primary veins some 6-7 on each side hidden; under surface bright grey-white with raised whitish yellow sparingly lepidote midrib, the primary veins concealed, all over clad with long rod-like epidermal wax-forming papillae and lepidote with brownish or orange-coloured unequal discontinuous peltate scales sunk in the leaf-pits and overlapped more or less by the wax-forming papillae, the scales with swollen convex glistening disk distance between the scales greater than their diameter, about 6-7 scales in a sq. mm.; petiole reddish brown about 7 mm. long bristly all over and especially below, grooved and puberulous in groove, lepidote amongst the bristles below. Flowers solitary terminal; flower-bud ovoid the last leaf of the year's shoot adpressed to the bud and becoming leaf-scale-like; outer bracts rounded and with an acute tip keeled reddened above sometimes lepidote on back when exposed with

longus lepidotus setulosus. Flores solitarii terminales; bracteolae lineares circ. 1.3 cm. longae pedicello longiores; pedicelli stricti erecti circ. 1 cm. longi bracteis intimis amplexicaulibus cincti. Calyx magnus circ. 1 cm. longus foliaceus submembranaceus ad medium vel ultra 5-lobatus, dorso glabro striato; lobi rotundati crenulati ciliati. Corolla lutea aperte cupulari-campanulata circ. 2 cm. longa extus squamulis scintillantibus lepidota intus glabra 5-loba; lobi lati rotundati circ. 1 cm. longi 1.5 cm. lati. Stamina 10 subaequalia corolla breviora stylo longiora; filamenta supra basim glabrum villosa; antherae aurantiacorum rubrae 5 mm. longae. Discus puberulus. Gynaecium ad 1 cm. longum; ovarium petasiforme circ. 3 mm. longum truncatum sulcatum, squamulis stipitatis albidis carnosulis dense obsitum; stylus validus brevis basi lepidotus decurvus apice clavatus. Capsula ovoidea calyce saepe rubro inclusa, valvis 5 dehiscens.

a few peziza-like glistening orange scales, margin shortly whitely ciliate; inner bracts about 1 mm. long clasping the pedicel and persisting as a sheath round it even until fruit is formed; bracteoles about 1.3 cm. long longer than pedicel linear pilose and white-hair-crested elepidote; pedicel red-tinted densely bristly elepidote barely 1 cm. long not swollen below the calyx. Calyx large foliaceous membranous about 1 cm. long campanulate yellowish outside glabrous divided to middle or beyond into 5 subequal rounded crenulate lobes about 1 cm. broad with fan-spreading veins eciliate. Corolla fleshy yellow open cup-shaped-campanulate about 2 cm. long lepidote outside with glistening scales glabrous inside, at the base forming a wide short tube slightly compressed laterally expanding into a broad 5-lobed limb; lobes broad imbricate about 1 cm. long 1.5 cm. broad. Stamens 10 subequal, five a very little shorter than the other five all shorter than corolla; filaments fleshy stout dilated downwards naked at very base above that villous to mouth of basal narrower part of corolla; anthers oblong orange-red about 5 mm. long. Disk puberulous below the ovary. Gynaeceum about 1 cm. long shorter than stamens; ovary dome-shaped truncate grooved about 3 mm. long densely clad with white mushroom-like somewhat succulent stalked scales; style stout slightly decurved with some white scales at the base broadened into a clavate tip below the lobulate stigma. Capsule ovoid with style persistent until dehiscence lepidote outside completely enclosed in the persistent slightly enlarged somewhat hardened striate often red calyx, dehiscing to base by 5 valves.

N.W. Yunnan. Kari Pass, Mekong-Yangtze divide. Lat. 27° 40' N. Alt. 12,000–13,000 ft. On ledges of cliffs. Shrub of 2 ft. [In fruit.] G. Forrest. No. 12,942. Aug. 1914.

Yunnan. [Without precise locality.] Duplicate in mature fruit. G. Forrest. No. 13,574. Oct. 1914.

N.W. Yunnan. Mekong-Salween divide. Lat. 28° 20' N. Alt. 12,000 ft. On boulders and ledges of cliffs. Shrub of 1–2 ft. Flowers bright yellow. G. Forrest. No. 14,059. June 1917.

Yunnan. [Without precise locality.] G. Forrest. No. 15,288.

N.W. Yunnan. Mekong-Salween divide. Lat. 28°. Alt. 10,000–11,000 ft. Duplicate. G. Forrest. No. 16,558. June 1918.

Yunnan. [Without precise locality.] G. Forrest. No. 17,352. Duplicate in fruit. Oct. 1918.

A lovely species of the affinity of *Rh. sulfureum*, Franch. In the dried specimens the bright green of the upper-leaf surface and the grey-white of the under surface combined with the bright

yellow of the flower are a pleasing colour-blend, and as the plant is a dwarf with abundance of close-set foliage it should be an effective rock-garden plant. To my eye it is in the dried specimen one of the most charming of the dwarf Rhododendrons which Forrest has collected. Those who have flowered *Rh. sulfureum*, Franch. in cultivation obtain a suggestion of our plant from it. But *Rh. megeratum* is smaller leaved and the grey-white under leaf is much brighter and the flowers are larger.

Rhododendron nakotiltum,* Balf. f. et Forrest.†

Shrub about 3.5 m. high with stout branches. Branchlets a year old about 5 mm. in diameter bright green and sprinkled with whitish and reddish floccose branched hairs, older branches purple glabrescent. Foliage-leaf buds unknown. Leaves petiolate as much as 13.5 cm. long; lamina oblong or obovate-oblong or somewhat oval-lanceolate about 11 cm. long and 3.5 cm. broad, apex somewhat beaked ending in a short horny mucro, margin cartilaginous almost flat, base broadly obtuse; upper surface opaque dark green shagreened (when dry) more or less clad with vestigial floccose hairs, midrib grooved lined with floccose hairs primary veins about 12 on each side hardly visible; under surface buff-coloured covered everywhere with indumentum obscuring the venation excepting the midrib, rosette-hairs of the indumentum of two forms, small persistent white with prostrate broad short vesicular branches, larger with long ascending vesicular thinner branches forming an upper more

* *νακότηλος*, having the wool plucked off—in allusion to the fall of the upper stratum of indumentum.

† *Rhododendron nakotiltum*, Balf. f. et Forrest.—Frutex ad 3.5 m. altus ramis crassis primo viridibus et conspersim floccosis demum erubescens glabrescentibus. Folia petiolata ad 13.5 cm. longa; lamina oblonga vel obovato-oblonga vel subovali-lanceolata ad 11 cm. longa, 3.5 cm. lata subrostrata basi late obtusa; supra opaca olivacea glabrescens sed pilorum vestigiis notata; subtus pallide fulva costa media pallidiore prominula ubique indumento bistrato induta, pilis indumenti rosulatis strati superi detersilis e ramulis ascendentibus latis vesicularibus brunnescentibus, strati inferi persistentis e ramulis brevibus vesicularibus albidis prostratis constructis; petiolus viridis paullo alatus ad 2 cm. longus plus minusve floccosus. Inflorescentia umbellata 12–15-flora; bractee extimae crustaceae rotundatae mucronatae intus dense glandulosae et puberulae extus furfuraceae, intimae spathulatae submembranaceae extus intusque sericeo-pilosae; bracteolae filiformes ad apicem paullo clavatae pedicellis breviores; pedicelli circ. 2 cm. longi eglandulosi dense floccoso-pubescentes. Calyx parvus circ. 1.5 mm. longus carnosulus 5-lobus; lobi rotundati dorso glabri margine sparsim ciliati. Corolla pallide rosea kermesino-variculosa maculata aperte campanulata circ. 3.5 cm. longa extus glabra intus sparsim puberula 5-loba; lobi lati circ. 1.2 cm. longi 2.2 cm. lati. Stamina 10 inaequalia corolla gynaeceoque breviora; filamenta dense puberula. Discus glaber. Gynaeceum corolla brevius; ovarium cylindricum truncatum dense floccosum eglandulosum; stylus glaber.

or less deciduous stratum and becoming brown, midrib elevated less hairy and paler in colour; petiole bright green slightly winged grooved above as much as 2 cm. long always more or less clad with floccose hairs. Flowers 12-15 in a compact terminal umbel; bracts persistent at first flower-opening, outer sterile thick crustaceously leathery chestnut-brown rounded-ovate mucronate keeled inside densely glandular and puberulous towards the top floccose, the glands capitate orange-coloured short-stalked, outside furfuraceously puberulous at top and over mucro red- or white-floccose; intermediate are membranous and broadly ovate-oblong; inner fertile bracts long spathulate nearly 4 cm. long and 1 cm. broad more or less membranous, outside and inside densely covered with white curled adpressed hairs, mucronate at the apex and there hair-crested with red or white hairs; bracteoles filiform slightly clavate at tip hairy from the base about 1.2 cm. long shorter than pedicels; pedicels about 2 cm. long eglandular densely floccose-pubescent. Calyx small about 1.5 mm. long fleshy cut to near base into 5 rounded lobes which are glabrous on the back and have a few marginal cilia. Corolla pale rose with a posterior basal crimson blotch and a few crimson spots above it, openly campanulate from the base about 3.5 cm. long slightly oblique, outside glabrous, inside at base puberulous, 5-lobed; lobes short and broad about 1.2 cm. long and 2.2 cm. broad emarginate and undulate. Stamens 10 unequal shorter than corolla and gynaecium, longest about 2.4 cm. long with anthers about 3 mm. long, shortest about 1.3 cm. long with anthers 2.5 mm. long; filaments stoutish dilated downwards and from the base densely puberulous to above the ovary. Disk apparently glabrous. Gynaecium about 2.8 cm. long shorter than corolla; ovary about 5 mm. long cylindric truncate grooved completely covered by an indumentum of floccose somewhat fasciate reddish and uncoloured ascending adpressed hairs, eglandular; style glabrous pale-coloured slightly expanding below the dark-coloured lobulate lipped stigma.

W.N.W. Yunnan. Mekong-Salween divide. In pine forests. Alt. 11,000-12,000 ft. Lat. 28° 20' N. Flowers pale rose with a blotch of crimson at base. G. Forrest. No. 14,060. June 1917.

One of these N.W. Yunnan Rhododendrons, with bistrate indumentum on the under-leaf surface, which occupy a position in the genus somewhere between the Lacteam series and the Roxianum series. It sheds its upper stratum of indumentum leaving the under stratum as a whitish layer. The prominent red blotch at the base of the corolla is a distinguishing mark of the species amongst its allies.

Rhododendron planetum,* Balf. f.†

Shrub with stout branches. Branches a year old as much as 7 mm. in diameter green more or less clad with a white deterrent indumentum of intricately interwoven long branching somewhat vesicular whitish hairs, older branches glabrous. Foliage-buds ovoid somewhat glutinous; outer scale-leaves broad semilunate with smooth margin, followed by more ovate ones and then oblong-oval ones, all more or less puberulous outside the inner ones most so and sticky, the margins only sparsely ciliate and with glutinous hairs; young leaves revolute. Leaves petiolate as much as 22 cm. long; lamina leathery oblong or elongated narrow oval as much as 20 cm. long 6 cm. broad obtuse or subacute ending in a red tuberculate mucro, margin slightly cartilaginous, base cuneate and extending as a distinct narrow wing on each side of petiole to its base; upper surface bright green smooth glabrous save for the reddened narrowly grooved midrib which has vestiges of floccose hairs, primary veins some 20 on each side slightly grooved; under surface pale green marked by the red-tinted reticulation of the ultimate submerged veins, midrib reddened large prominent, primary veins reddened slightly raised, whole surface sprinkled with vestiges of deterrent indumentum particularly at the base and along the side of the midrib and along the primary veins, hairs of the indumentum floccose and much branched often vesicular but also sebaceous and especially on midrib glandular some branches ending in a rounded or ovoid gland, also short-stalked glands occur intermixed with the hairs, older leaves often appearing quite glabrous; petiole stout about 2 cm. long distinctly winged and grooved (puberulous in groove) clad like the stem with indumentum

* *πλανητός*, wandering—in allusion to its appearance in cultivation as a "rogue."

† *Rhododendron planetum*, Balf. f.—Frutex ramis crassis. Rami annotini circ. 7 mm. diam. virides indumento tomentoso deterrenti plus minusve vestiti demum glabrescentes. Alabastra ovoidea glutinosa perulis puberulis extimis semilunatis neque acuminatis nec caudatis vix ciliatis. Folia ad 22 cm. longa petiolata; lamina coriacea elongato-ovalis vel oblonga ad 20 cm. longa 6 cm. lata obtusa vel subacuta basi cuneata in petiolum decurrens; supra laete viridis laevis glabra (costa media anguste sulcata excepta) venis primariis utrinsecus circ. 20; subtus pallide viridis pilis ramosis floccosis et glandulis conspersa costa media elevata; petiolus crassus tomentosus glabrescens. Umbella terminalis circ. 8-flora; bracteae extimae rotundatae truncatae; intimae oblongo-spathulatae sericeae; bracteolae circ. 1.5 cm. longae pilo-cristatae; pedicelli vix 2 cm. longi glandulosi. Calyx parvus vix 1 mm. longus glaber 5-lobatus; lobi semilunati. Corolla infundibuliformi-campanulata subregularis ad 5.5 cm. longa pallide rosea emaculata glabra 7-loba; lobi rotundati emarginati circ. 1.2 cm. longi 2.4 cm. lati. Stamina 10 inaequalia corolla gynaeceoque multo breviora; filamenta puberula; antherae atro-coccineae. Discus viridis glaber. Gynaeceum corolla paullo brevius; ovarium glabrum latum petasiforme circ. 5 mm. longum; stylus glaber; stigma latum discoideum lobulatum.

which is detersile and may leave the petiole glabrous. Flowers in a terminal about 10-flowered umbel the rhachis hardly elongated; outer bracts rounded truncate mucronulate more or less puberulous outside, inner bracts oblong-spathulate 3.5 cm. long 1 cm. or more broad apiculate silky; bracteoles about 1.5 cm. long filiform with long wavy hairs from the base and at the top densely clothed with straight erect hairs forming a hair-crest; pedicels under 2 cm. long green glandular with short-stalked globose glands, not swollen below calyx. Calyx small about 1 mm. long green or pink showing 5 half-moon-shaped lobes glabrous or with an occasional gland. Corolla as much as 5.5 cm. long funnel-shaped campanulate from the base pink often showing deeper tinted interpetaline lines glabrous inside and outside somewhat fleshy, at base of tube gibbous and retuse; limb expanding into 7 erect emarginate rounded lobes as much as 1.2 cm. long 2.4 cm. broad. Stamens 14 unequal much shorter than corolla and gynaecium, longest about 3 cm. long with anther 2.5 mm. long, shortest about 1.7 cm. long with anther 1.5 mm.; filaments widened downwards puberulous towards base; anthers black-crimson. Disk green glabrous. Gynaecium a little shorter than corolla; ovary broad dome-shaped with rounded top not conspicuously grooved most glabrous about 5 mm. long; style glabrous pink-tinted slightly swollen below the broad discoid lobulate stigma.

Szechwan. Wilson.

Mr. J. C. Williams gives me the following history of this plant, of which he has sent to me a specimen from Caerhays:—"It was a rogue which I found at Coombe Wood in a bed with the label 1882. Harrow was quite certain it had no relationship to any of his hybrids. I remember turning to them and going over the bed to see if I could find anything like it and I was unable to. I am unable to find anything like it here. As to what 1882 was as regards the other plants I am unable to remember and only know that it seemed plain to me there was no relationship direct or indirect between them. I have never let this plant get out of touch with me since it came here." Mr. Williams gives the following copy of Wilson's Field Note:—"1882. *Rhododendron*. Bush 4-12 ft. Rose. Mts. Tatsienlu. Leaves ovate-cordate"; and adds the note, "in this case is not in his handwriting." 1882 is not attached in *Plantae Wilsonianae* to a *Rhododendron*. It is clear that the label copied by Mr. Williams does not apply to *Rh. planetum*—the description of the leaves of 1882 as "ovate-cordate" indicates a different plant. I cannot match what I am calling *Rh. planetum* with any known species. The look of the foliage and flower-truss and flower suggests the *Decorum* series. It has the long leaves of *Rh.*

discolor, Franch. of that series and the funnel-shaped campanulate corolla that is typical of that series. But then it shows a glabrous dome-shaped ovary and style and not the glandular ovary which marks the *Decorums*. In this character of dome-shaped glabrous ovary and glabrous style it is associated with *Rh. calophytum*, Franch., and *Rh. sutchuenense*, Franch., and it has the long leaves of these species with a detersile indumentum on the lines of that of *Rh. sutchuenense*, though not just similar. But it has a 7-lobed corolla of altogether different shape. Here it is funnel-shaped campanulate erect with radiating subequal lobes, in these two species the corolla is obliquely campanulate. It seems to occupy a position between the true *Decorums* and the group which includes *Rh. calophytum* and *Rh. sutchuenense*, which two species come near the members of the *Grande* series, different however in their glabrous ovary.

***Rhododendron pothinum*,* Balf. f. et Forrest.†**

A shrub about 1 m. high with twiggy thin slightly nodular branches about 2 mm. in diameter when a year old and then red and covered with red bristles, annual growths usually short bearing rosette-clusters of some 5-8 leaves, scale-leaves of the foliage-buds falling early, bristles sometimes falling early leaving scars but usually some persistent for several years on the grey surface. Foliage-buds narrow fusiform pointed; outermost scale-leaves crustaceous rounded at base with an acuminate tail or apiculus about 5 mm. long, followed by longer oblong oboval ones all keeled slightly puberulous outside and with dense hair-covering at the mucro, more or less ciliate; innermost scale-leaves greenish-yellow membranous oblong-spathulate about 1.5 cm. long 4 mm. broad rounded at top mucronate ciliate; young leaves revolute in bud sparingly floccose on upper surface glabrous on under surface save for some hairs on midrib. Leaves shortly petiolate as much as 7.5

* *ποθινός*, much desired—as a plant for our gardens.

† *Rhododendron pothinum*, Balf. f. et Forrest.—Frutex ad 1 m. altus. Ramuli tenues setuliferi demum subnodulosi. Alabastrorum perulae deciduae. Folia petiolata ad 7.5 cm. longa; lamina subcoriacea ovalis vel obovalis ad 7 cm. longa 2.5 cm. lata, apice obtusa vel rotundata mucronata, margine cartilaginea plana vel leviter recurva, basi obtusa; supra olivacea laevis glabra; subtus griseo-viridis vel flavido-viridis glabra, costa media rubescente elevata, venis primariis nunc sparsim floccosis basi que setuliferis; petiolus circ. 5 mm. longus rubidus setuliferus. Umbella 4-5-flora; pedicelli circ. 1 cm. longi rubri eglandulosi longe floccosi. Calyx ad 3 cm. longus extus glaber 5-partitus; lobi rubri subcarnosuli rotundati margine floccosi persistentes. Corolla campanulata ad 3.5 cm. longa coccinea emaculata glabra; lobi 5 rotundati emarginati. Stamina 10 corolla multo breviora; filamenta glabra. Discus glaber. Gynaeceum corolla brevius staminibus paullo longius; ovarium ad 4 mm. longum petasiforme truncatum sulcatum eglandulosum floccoso-tomentosum; stylus glaber. Capsula cylindrica circ. 1 cm. longa plus minusve setosa calyce aucto ultra medium inclusa.

cm. long ; lamina thinly leathery oblong-oval or oboval as much as 7 cm. long 2.5 cm. broad, apex obtuse or rounded with a short projecting red tuberculate mucro, margin cartilaginous plane or slightly recurved sometimes roughened and with an occasional bristle towards base, base obtuse ; upper surface mat olive-green smooth glabrous save grooved midrib which may have some floccose hairs at base and some red bristles, primary veins some 7 or 8 on each side concealed ; under surface grey green marked by the red veinlets of the ultimate venation, glabrous or with some whitish or reddish floccose hairs on elevated often red midrib and hardly raised primary veins sometimes also a few red bristles on midrib and veins particularly at the base ; petiole reddened about 5 mm. long grooved bearing red bristles often densely covered by them. Flowers in a terminal 4-5-flowered umbel ; bracts and bracteoles falling as the flowers open ; pedicels red about 1 cm. long rarely longer densely floccose with long stalked floccs with erect branches eglandular, swollen at the top. Calyx bright red conspicuous with a darker crimson cup, about 3 cm. long divided to base or near it into 5 rounded somewhat unequal slightly fleshy lobes broader than long about equal to cup in length glabrous outside floccose-ciliate persistent. Corolla deep crimson without spots slightly more darkly blotched at base posteriorly campanulate about 3.5 cm. long somewhat fleshy at base and 5-gibbous with faint interpetaline ridges inside, glabrous outside and inside ; lobes large rounded about 1.5 cm. long 2 cm. broad emarginate. Stamens 10 slightly unequal longest about 2.2 cm. long shortest about 1.8 cm. long shorter than corolla and gynaecium ; filaments slightly dilated downwards glabrous ; anthers about 2 mm. long. Disk glabrous. Gynaecium not 2.5 cm. long shorter than corolla slightly longer than stamens ; ovary stout dome-shaped deeply grooved truncate about 4 mm. long tomentose with long stalked freely branched fasciate floccose hairs eglandular ; style glabrous stout dilated below the lobulate stigma. Capsule a little over 1 cm. long cylindric bristly or warted by scars of bristles, through more than half its length enclosed in accrescent brown leathery calyx, dehiscing to base from apex by 5 woody valves.

S.E. Tibet. Tsarong. On Doker-la. Mekong-Salween divide. Lat. 28° 25' N. Alt. 13,000-14,000 ft. On open bouldery slopes. Shrub of 2-3 ft. Flowers deep crimson. G. Forrest. No. 16,702. June 1918.

Rh. pothinum in dried specimens gives all the promise of a bright garden plant deserving the name that is attached to it.

The species is a near ally of *Rh. eudoxum*, Balf. f. et Forrest, and comes from the same region of S.E. Tibet. The similarity in general appearance of the plants in dried specimens is so great

that at sight one might assume that they were the same, but careful examination of them brings out so many differences that their specific union is not justifiable. A prominent feature of difference is the bristly covering of the stems when well developed in *Rh. pothinum*, a covering which spreads up on to the petiole and the base of the leaves. The bristles often are so many as to make the surface quite shaggy and yet in other cases they are so few as to be found with difficulty. With these bristles there are no glands. In *Rh. eudoxum* on the other hand this bristliness is never very marked and may disappear, but there are always glands which are not found on the stem or petiole of *Rh. pothinum*. Then the underleaf surface of *Rh. pothinum* wants the indumentum of *Rh. eudoxum*, and other points of difference are the shorter eglandular pedicels of *Rh. pothinum*, its smaller calyx with lobes glabrous outside and only flock-fringed, its unspotted corolla, glabrous stamens, gynaeceum much shorter than the corolla, tomentose eglandular ovary and stouter style.

Other species with which *Rh. pothinum* is allied are *Rh. temenium*, Balf. f. et Forrest and *Rh. trichomiscum*, Balf. f. et Forrest. See p. 169.

Rhododendron preptum,* Balf. f. et Forrest.† (Falconeri.)

Tree with stout branches as much as 5 cm. in diameter when a year old densely tomentose the tomentum persisting more or less for several years. Leaves petiolate as much as 18 cm. long; lamina thickly leathery wider above the middle elongated-obovate as much as 16 cm. long 7 cm. broad, rounded at apex and with a prominent red-tipped mucro over 1 mm. long, margin cartilaginous plane slightly undulate, base obtuse; upper surface

* *αρεπτός*, distinguished—in allusion to its large leaves and flower-truss.

† *Rhododendron preptum*, Balf. f. et Forrest.—Arbor parva ramis crassis tomentosis. Folia petiolata ad 18 cm. longa; lamina crasse coriacea oblongo-obovata ad 16 cm. longa 7 cm. lata, apice rotundata mucronata, margine cartilaginea paullo undulata, basi obtusa; supra glabra opaca olivacea, costa media sulcata, venis primariis utrinsecus circ. 10 paullo sulcatis; subtus pallide fulva ubique indumento tomentoso bistrato vestita, pilis strati superi detersilibus elongato-cupuliformibus longe stipitatis laxè ramulosis, strati inferi rosulatis ramulos vesiculosos emittentibus in pelliculam albidam crustaceam agglutinatis; petiolus crassus vestigiis indumenti albidis indutus ad 2 cm. longus. Inflorescentia racemoso-umbellata circ. 20-flora, rhachi circ. 3.5 cm. longa tomentosa; pedicelli 2 cm. longi vel breviores dense tomentosi sub flore oblique expansi. Calyx parvus vix 1.5 mm. longus dentatus dense tomentosus. Corolla oblique campanulata circ. 3.5 cm. longa carnosula lacteo-alba varo basali atro-coccineo notata glabra 8-loba; lobi rotundati vel subtruncati circ. 1 cm. longi 1.4 cm. lati. Stamina 16 corolla gynaeceoque multo breviora; filamenta deorsum paullo dilatata puberula; antherae pallidae. Discus glaber. Gynaeceum circ. 3 cm. longum corolla paullo brevius; ovarium conoideum truncatum dense tomentosum; stylus glaber crassus sub stigmate discoidè lobulato recurvo expansus.

mat olive-green glabrous slightly rugulose not shagreened midrib grooved often purpled, primary veins some 10-11 on each side slightly grooved; under surface everywhere clad with a pale buff-coloured bistrate indumentum the raised midrib and primary veins also forming a non-scintillating somewhat woolly layer, upper stratum more or less detersile composed of long stalked narrow funnel-shaped cups, the stalk many-celled giving off a few branches, the cup also giving off branches from the sides outside hardly forming a rim and deliquescing into many twisted branches, the branching so free as sometimes to obscure the cup form, under stratum of rosette-hairs with short stalk and spreading thin-walled vesicular agglutinate branches forming a white persistent crust under the upper stratum and exposed when the latter falls; petiole stout about 2 cm. long 4 mm. in diameter purple and clad with remains of an indumentum like that of underleaf surface. Flowers in a terminal racemose umbel about 20-flowered, rhachis more or less tomentose about 3.5 cm. long; pedicels not exceeding 2 cm. in length 1.5 mm. in diameter densely tomentose slightly brown-tinted, at top set on very obliquely to flower. Calyx saucer-shaped small about 1.5 mm. long densely tomentose like the pedicel with short marginal teeth acute or obtuse. Corolla obliquely campanulate fleshy barely 3.5 cm. long on convex side, creamy white with a deep basal crimson blotch darkest on 3 or 4 posterior petals, slightly pouched and retuse at base glabrous outside and inside 8-lobed; lobes rounded or somewhat truncate and retuse about 1 cm. long 1.4 cm. broad. Stamens 16 unequal much shorter than corolla and gynaecium; filaments slightly expanded downwards puberulous; anthers pale about 3 mm. long. Disk small glabrous. Gynaecium about 3 cm. long a little shorter than corolla; ovary conoid truncate grooved densely tomentose with fasciate erect closely packed hairs slightly brown-tinted; style short glabrous expanded at top into a broad discoid lobulate recurving stigma.

N.E. Upper Burma. N'Maikha-Salween divide. Lat. 26° 20' N. Alt. 11,000 ft. In bamboo and mixed scrub. Shrub of 6-9 ft. Flowers almost gone, yellowish-white or pale yellow with a crimson blotch at base. G. Forrest. No. 18,034. May 1919.

A species of the Falconeri series finding its nearest ally in *Rh. galactinum*, Balf. f.,* collected by Wilson in Szechwan (*Rh. lacteum*, Rehd. et Wils., in Pl. Wilsonianae, i (1913), 545 in part).

* This plant is Wilson's No. 4254, and is in cultivation but has not yet flowered. Until we have flowers an adequate description is not possible, and the name has been attached to the plant in gardens for convenience of reference and distinction from *Rh. lacteum*, Franch., and *Rh. fictolacteum*, Balf. f. (See Trans. Bot. Soc. Edin., xxvii (1916), 104.)

Of *Rh. galactinum* flower is as yet unknown and the flowers in Forrest's specimen of *Rh. preptum* are few. It is impossible therefore to make a precise comparison of the two species. But whilst their indumentum hairs are much alike and the surfaces upper and under of the leaves have a close resemblance, the form of the leaf at once separates the species. In *Rh. preptum* the leaf is always broadest above the middle, in *Rh. galactinum* at the middle—in *Rh. preptum* they are oblong-obovate or oblong-lanceolate, in *Rh. galactinum* oblong-ovate.

Rhododendron protistum,* Balf. f. et Forrest.† (Grande.)

Robust shrub reaching 9 m. in height. Branches thick when a year old as much as 1 cm. in diameter tomentose with a dense yellowish-grey tomentum of intricately branched long hairs persistent on older stems and becoming a dirty grey before decortication of branches. Foliage-buds unknown. Leaves large petiolate as much as 45 cm. long; lamina thinly leathery lanceolate or oblanceolate as much as 40 cm. long 13 cm. broad many smaller, apex obtuse with a short prominent mucro, margin broadly cartilaginous slightly undulate flat, narrowed to a broadly cuneate base and there slightly decurrent on petiole; upper surface dark green mat rugulose glabrous but coated with a thin dirty grey scurf as if vestiges of a juvenile indumentum, midrib grooved from the base, primary veins as many as 26 on each side at first spreading from midrib at a wide angle often nearly horizontal then curving upwards towards margin; under surface opaque green but veiled by a thin stratum of white cobwebbed hairs mixed with rosette-hairs, at base and margin of leaf often forming a grey-white complete indumentum, the hairs hardly agglutinate, midrib prominent dark purple-red with a few cobwebbed hairs; petiole as much as 5 cm. long stout grooved glabrescent but showing vestiges of withered cobwebbed

* πρόστιτος, first of the first—in allusion to its merits.

† *Rhododendron protistum*, Balf. f. et Forrest.—Frutex robustus ad 9 m. altus. Rami crassi tomentosi. Folia petiolata ad 45 cm. longa; lamina tenuiter coriacea lanceolata vel oblanceolata ad 40 cm. longa 13 cm. lata, apice obtusa, margine cartilaginea, deorsum attenuata basi late cuneata; supra atroviridis glabra pilorum juvenilium vestigiis conspersa; subtus albidula vel viridis indumento tenui pilorum arachnoideorum intricatim intertextorum constructo induta; petiolus crassus ad 5 cm. longus sulcatus glabrescens. Inflorescentia racemo-umbellata 30-flora (vel ultra), rhachi ad 6 cm. longa arachnoidea; bracteae fertiles magnae ad 6 cm. longae 2 cm. latae obovato-oblongae truncatae apiculatae utrinque sericeae; bracteolae breves circ. 5 mm. longae sericeae; pedicelli vix 2 cm. longi validi tomentosi. Calyx parvus ad 3 mm. longus minute dentatus tomentosus. Corolla carnosula flavido-alba basi roseo-suffusa oblique campanulata 8-loba. Stamina 16 inaequalia gynaececo breviora; filamenta glabra. Discus glaber. Gynaeceum corolla paullo brevius; ovarium ovoideum 16-loculare sulcatum dense lanato-tomentosum indumenti pilis fasciatis; stylus glaber.

hairs. Inflorescence a racemose-umbel of many (30 or more) flowers, rhachis as much as 6 cm. long cobwebbed; outer bracts unknown, inner fertile bracts oblong-spathulate truncate apiculate as much as 6 cm. long 2 cm. broad inside and outside sericeous, margin slightly ciliate; bracteoles linear barely 5 mm. long densely sericeous; pedicels short stout about 1.5 cm. or a little more long enwrapped in a thin ochre-coloured indumentum of cobwebbed hairs slightly swollen below the flower to which it is only slightly oblique. Calyx minute about 3 mm. long with 8 unequal deltoid teeth the larger sometimes twice as long as the cup tomentose like the pedicel. Corolla fleshy creamy-white flushed rose campanulate oblique about 5.5 cm. long on posterior side, the petals slightly pouched at base of tube, glabrous outside and inside 8-lobed; lobes a little over 1 cm. long 2 cm. broad. Stamens 16 unequal shorter than corolla and gynaecium, longest as much as 4.5 cm. long shortest as much as 3.5 cm.; filaments slender slightly wider at base, glabrous; anthers oblong about 4 mm. long. Disk glabrous. Gynaecium a little shorter than corolla; ovary ovoid about 8 mm. long 16-locular grooved pink-tomentose being clad with fasciate hairs having short and thin stalks and long curling branches which form a loose woolly surface; style glabrous clavate under the large discoid lobed stigma.

W. N.W. Yunnan. Mekong-Salween divide. Lat. 28° N. Alt. 13,000 ft. In Rhododendron forest. Shrub of 20-30 ft. Flowers fleshy creamy-white flushed rose. G. Forrest. No. 16,351. May 1918.

This fine species must be placed in the Grande series. It differs in the indumentum from other members of the series. We have not sufficient material for ascertaining the history of development of the coating of the under surface of the leaves, but what we have suggests that in the young state the leaves are clad like others of the series with a white indumentum of cobwebbed and rosette-hairs. As the leaf oldens this withers on the upper surface in the usual fashion, but on the under surface it seems to disappear more or less over a large area of the surface save for a thin web covering it like a fungus-mycelium. The green epidermis beneath it is visible. On other parts of the surface the indumentum persists and forms a white crust like that characteristic of the Grande series. There is no species in the series to which *Rh. protistum* has a specially near alliance unless it be *Rh. grande* or *Rh. argenteum*. It can be readily recognised by the broad lanceolate or oblanceolate somewhat thin leaves with the indumentum-character mentioned and it has a 16-chambered ovary.

Rhododendron pubescens,* Balf. f. et Forrest. (Scabrifolium.)

Much and intricately branched very leafy shrub of a little over 1 m. high with thin short yellowish branches (when a year old a little over 1 mm. in diameter) densely pubescent with white shorter hairs and also longer somewhat setulose hairs intermixed with stalked concave reddish or orange infiltrated peltate scales, traces of the long hairs particularly remaining on the dark grey older twigs until decortication, bearing many small leaves arranged along the length of the year's shoot and persisting some of them for two or three years, many leaves clustered around the apical bud to which the last leaves reduced in size are adpressed as an outer bud-covering. Foliage-bud small the outer scales triangular acuminate keeled densely pubescent outside ciliate mucronate, inner scales more ovate and thinner; young leaves conduplicate-convolute. Leaves shortly petiolate as much as 2.5 cm. long; lamina thick leathery narrowly oblong or oblanceolate or lanceolate as much as 2.2 cm. long 6 mm. broad, acute with a rounded mucro red tuberculate, margin revolute, base cuneate; upper surface dark green mat densely pubescent with white hairs and longer seta-like hairs also bearing a few distant stalked red or orange peltate scales and otherwise pitted with discontinuous pits out of which stalked peltate scales have fallen, no asperities towards the margin, midrib grooved and lined with hairs, primary veins not visible; under surface paler green-grey setulose and also pilose more densely than upper surface and with peltate scales like those of that surface only more of them, midrib raised and coated like the surface; petiole about 3 mm. long grooved red at base when young clad at base like the stem. Umbels 3-4-flowered several fascicled on each shoot one in axil of each of the upper-

* *Rhododendron pubescens*, Balf. f. et Forrest. — Frutex nanus circ. 1 m. altus. Rami tenues (annotini flavidi circ. 1 mm. diam.) pilis albidis et brevibus et longis setuliformibus squamulas aurantiacas intermixtas obtegentibus dense pubescentes. Alabastra parvula; perulae extus lepidotae puberulaeque, margine minute albo-ciliatae. Folia petiolata ad 2.5 cm. longa; lamina coriacea ad 2.2 cm. longa 6 mm. lata anguste oblonga vel oblanceolata vel lanceolata, acuta mucronata, margine revoluta, basi cuneata; supra olivacea opaca pilis brevibus et setuliformibus dense pubescens et squamulis paucis aurantiacis conspersa sed squamularum plurimarum foveis vacuis notata, costa media sulcata pubescente et lepidota, venis primariis occultis; subtus pallidior griseo-viridis, ut supra sed densius vestita, costa media elevata; petiolus circ. 3 mm. longus plus minusve rubidus pubescens et lepidotus. Umbellae laterales 3-4-florae ad apicem ramulorum fasciculatim aggregatae; bracteae extus puberulae et lepidotae; pedicelli 6-8 mm. longi puberuli setulosi et lepidoti. Calyx parvulus circ. .5 mm. longus annularis extus puberulus et lepidotus margine undulatus pilosus et setulosus. Corolla parva circ. 8 mm. longa; tubus infundibuliformis intus puberulus; lobi 5 oblongo-ovales extus lepidoti. Stamina 10 inaequalia, longissima corollam excedentia; filamenta puberula. Gynaeceum corolla et staminibus longius. Capsula oblonga recta circ. 6 mm. longa 2.5 mm. diam. puberula et lepidota.

most leaves, never terminal; outer bracts leathery rounded mucronulate, lepidote and puberulous outside, finely shortly ciliate on margin; inner bracts more oblong; bracteoles unknown; pedicels about 6–8 mm. long clad with setae short hairs and peltate scales. Calyx minute about .5 mm. long forming a fleshy ring with an indication on margin of 5 lobes, densely hairy and lepidote outside the margin of the lobes more or less setulose. Corolla small about 8 mm. long with a short funnel-shaped tube puberulous inside expanding into a 5-lobed limb; lobes oblong-oval lepidote outside longer than the tube. Stamens 10 unequal the longest a little longer than the corolla, shortest about 5 mm. long; filaments filiform with a tuft of hairs above the glabrous base. Gynaeceum longer than corolla and stamens. Young fruit green narrowly oblong-ovoid puberulous and lepidote; style glabrous. Capsule oblong straight about 6 mm. long 2.5 mm. in diameter finely pilose and lepidote.

S.W. Szechwan. Mu-li Mts. Lat. $28^{\circ} 12' N$. Alt. 10,000 ft. In thickets and amongst scrub. Shrub of 3–4 ft. In fruit. G. Forrest. No. 16,812. Aug. 1918.

The date of collection of specimens of this species has not been favourable. The flowers are all gone, only a few withered ones remaining on the young fruit. The fruits are not mature. The leaf-buds are hardly formed. Notwithstanding these deficiencies the species is so distinct I am able to describe it, although imperfectly. It belongs to the phylum of *Rh. mollicomum*, Balf. f. et W. W. Sm., and *Rh. hemitrichotum*, Balf. f. et Forrest. The latter species with its white wax-covered underleaf without hairs (save on midrib) and buds cobwebbed with hairs is easily diagnosed. The former is a nearer ally but without the bristle-shaped hairs of *Rh. pubescens*, has buds with long cilia, and much larger flowers. They all belong to the *Scabrifolium* series, but none of them have the asperities near the margin of the leaf on its upper side that are so prominent in *Rh. scabrifolium* and other members of the series.

***Rhododendron pyrrhoanthum*,* Balf. f.†**

Prostrate shrub with stout branches those a year old green glabrous as much as 4 mm. in diameter bearing leaves resembling

* $\pi\epsilon\gamma\gamma\omicron\varsigma$, red.

† *Rhododendron pyrrhoanthum*, Balf. f.—Frutex prostratus. Rami validi virides ad 4 mm. diam. glabri. Folia petiolata circ. 8 cm. longa; lamina coriacea convexa oblongo-ovalis ad 7 cm. longa 3.5 cm. lata, obtusa, margine cartilaginea recurva, basi obtusa; supra atroviridis rugulosa, costa media venisque primariis in sulcis profundis impressis, glabra (costa media puberula excepta); subtus concava pallide flavido-viridis glandulis floccisque sebaceis sparsim conspersa costa media venisque primariis prominulis; petiolus circ. 1 cm. longus erubescens sulcatus et in sulco puberulus. Flores in umbellam paucifloram terminalem dispositi; bractee sub anthesi persistentes intimae membranaceae obovato-

in appearance those of *Rh. zeylanicum* only smaller. Leaves petiolate about 8 cm. long; lamina leathery convex above oblong-oval, as much as 7 cm. long 3.5 cm. broad, apex obtuse mucronate, margin cartilaginous recurved, base obtuse; upper surface dark green glabrous excepting the midrib which is lined by withered hairs, midrib deeply sunk between the convex halves of the lamina on which the primary veins some 14 on each side are deeply sunk, ultimate veinlets forming a reticulum on the surface; under surface paler, yellow-green, with raised paler midrib and primary veins thinly sprinkled with short glands and irregularly branched small floccose hairs; petiole stout about 1 cm. long pinkish grooved above and there glandular and puberulous, elsewhere glabrous. Flowers in a small 5-flowered open terminal umbel the bracts remaining during flower-expansion; bracts outermost leathery ovate apiculate keeled, followed by more ovate, then rounded ones all more or less floccose and glandular outside and ciliate with greasy fasciate hairs; innermost bracts obovate spatulate reflexing from above the middle somewhat membranous greenish-yellow sticky, outside more or less floccose and glandular, margin densely ciliate with fasciate hairs and especially so around the mucro; bracteoles short about 5 mm. long white subulate hairy in upper part; pedicels unequal as much as 3 cm. long stout pink-tinted and thinly clad with fasciate floccose hairs and white stalked glands. Calyx saucer-shaped about 2 mm. long crimson; tube showing 5-6 glistening glabrous pouches; lobes 5 half-moon shaped glabrous outside but finely ciliate with short white flock-hairs and glands. Corolla blood-red campanulate unspotted and with faintest indication of a darker blotch a little above base of posterior petal, nearly regular about 3.5 cm. long glabrous inside and outside; tube fleshy at the base retuse with 5 pouches and 5 deep interpetaline grooves outside correspondingly ridged inside; limb with 5 thinner recurving rounded emarginate lobes each about 8 mm. long 2 cm. broad. Stamens 10 slightly unequal bunched in the middle of corolla-bell shorter than tube of corolla and than gynaecium, longest about 2.5 cm. long shortest about 1.8 cm.; filaments white fleshy slightly dilated to the base very shortly puberulous in lower portion; anthers ochre-coloured about 2.5 mm. long. Disk green lobulate puberu-

spatulatae glandulosae et floccosae; bracteolae breves circ. 5 mm. longae; pedicelli glandulosi et floccosi ad 3 cm. longi. Calyx ruber glaber nitidus parvus circ. 2 mm. longus gibbosus 5-lobus; lobi semilunati extus glabri minute ciliati. Corolla sanguinea tubulosa subangularis circ. 3.5 cm. longa carnosula glabra. Stamina 10 subaequalia corolla multo breviora; filamenta puberula. Discus puberulus. Gynaecium corolla paullo brevius staminibus longius; ovarium conoideum truncatum circ. 6 mm. longum sparsim puberulum et glandulosum; stylus glaber.

lous. Gynaecium a little shorter than corolla longer than stamens about 3.2 cm. long; ovary conoid truncate slightly grooved about 6 mm. long thinly puberulous with white fasciate flock-hairs which are intermixed with long-stalked white glands; style white glabrous scarcely enlarged at the tip where it forms a crimson lip around the dark stigmatic lobes.

Yunnan. G. Forrest.

This *Rhododendron* appeared at Werrington Park in a frame-bed of seedlings of *Rh. repens*, Balf. f. et Forrest. Mr. J. C. Williams tells me it is a plant of prostrate habit like *Rh. repens*, but with much larger leaves. The leaves, as Mr. Williams says, recall in form those of *Rh. zeylanicum*, Hort. and such like forms of *Rh. arboreum*, Sm. and *Rh. Delavayi*, Franch., but all these plants of the *Arboreum* series have a complete buff-coloured underleaf indumentum concealing the epidermis; here the epidermis is exposed between the scattered hairs and glands. I am impressed by the likeness to *Rh. fulgens*, Hook. f., and this not only in the foliage but also in the flower. There is no identity here, only an approach. The leaves in *Rh. fulgens* have more indumentum below and the flowers are on short pedicels in dense small trusses and have dark crimson blotches in the pouches of the petals—separating characters of easy recognition; on the other hand the similarity in the calyx with pouches on the tube and of the short tubular campanulate subregular corolla with deep indentations in the tube and the sparingly clad ovary are no less easily seen.

I have named this very distinct plant. There is no specimen of it in Forrest's collections, and if a hybrid origin be assumed for it two lines of parentage might in all the circumstances be suggested; namely, the *Arboreum* series through some form of *Rh. Delavayi*, and the *Forrestii* series through some form of *Rh. repens*—the foliage-form and flower-character coming mainly through the former, the habit through the latter. But the divergences from both shown by the plant are great. Mr. Forrest may be able to throw some light on the problem when he returns.

***Rhododendron regale*, Balf. f. et Ward.* (Falconeri.)**

Gnarled tree as much as 9 m. high with stout branches and large leaves. Branches a year old as much as 1.2 cm. in diameter

* *Rhododendron regale*, Balf. f. et Ward.—Arbor contorta ad 9 m. alta ramis crassis foliisque magnis. Rami annotini circ. 1.2 cm. diam. pellicula pilorum agglutinatorum grisei. Alabastra ignota. Folia petiolata ad 25 cm. longa; lamina crasse coriacea late oblanceolata ad 20 cm. longa 12 cm. lata, apice rotundata breviter mucronata, margine cartilaginea paullo recurva, deorsum attenuata in petiolum cuneatim subdecurrens; supra opaca atro-viridis leviter rugulosa

ash-grey the colour due to an agglutinate pellicle of hair-indumentum many cells of which become rufous red (the material is not sufficient for accurate further description), vestiges of this pellicle are seen on older parts of branches. Foliage-buds unknown. Leaves petiolate as much as 25 cm. or more long; lamina thickly leathery broadly oblanceolate as much as 20 cm. long 12 cm. broad, apex rounded with a short tuberculate mucro, margin thickly cartilaginous slightly tinted red (recurved in dried specimens), tapering to the somewhat wedge-shaped base where it is prolonged more or less evidently along the petiole; upper surface mat dark olive-green not shagreened and only slightly wrinkled glabrous but for the midrib in the narrow groove of which are white vestiges of hairs like those on the young stems, midrib darker coloured the rest of surface losing its groove and becoming convex as it passes into petiole, primary veins about 15 on each side very shallowly grooved; under surface grey with a prominent thick red-tinted midrib and prominent like-tinted primary veins, the grey surface composed of a bistrake indumentum, the under stratum a grey pellicle of agglutinate rosette-hairs exposed in older leaves as a smooth scintillating surface where the upper stratum has fallen off, upper detersile stratum forming complete surface in younger leaves in patches only on older consisting of funnel-shaped cup-hairs broad and open the mouth easily seen usually but where crowded together becoming more narrow funnels, each with a short stalk and a delicate thin wall of small cells elongated in the direction of the axis of the cup, the margin of the cup prolonged into a fringe of short hair-branches which interlace with those of adjacent cups; when uncompressed and complete the surface appears foveolate; petiole stout flat or convex not grooved above about 2.5 cm. long showing traces of the same

glabra (costa media pilorum juvenilium vestigiis induta excepta), costa media anguste sulcata basim versus elevata, venis primariis utrinsecus circ. 15; subtus indumento bistrato grisea costa media et venis primariis elevatis rubrotinctis percursa; indumenti stratum superum detersile e pilis cupulari-infundibuliformibus stipitatis et ad os ramulis radiantibus cinctis aedificatum, stratum inferum persistens pilorum rosulatorum agglutinatorum pelliculam faciens; petiolus crassus circ. 2.5 cm. longus supra planus vel leviter convexus ut ramuli indumento plus minusve vestitus. Flores in racemo-umbellam circ. 12-floram dispositi, rhachi puberula; bracteae intimae oblongae acutae ad 4 cm. longae extus intusque sericeae; bracteolae vix 1 cm. longae lineari-clavatae pilosae pilo-cristatae; pedicelli dense tomentosi 3-4 cm. longi. Calyx parvus circ. 2 mm. longus patelliformis minute dentatus dense tomentosus. Corolla flavido-alba varo atropurpureo basali notata circ. 3.5 cm. longa campanulata paullo obliqua carnosula 9-loba; lobi rotundati emarginati imbricati circ. 1 cm. longi 1.5 cm. lati. Stamina 18 inaequalia corolla dimidio breviora gynaeceo paullo breviora; filamenta puberula. Discus glaber. Gynaeceum circ. 2.5 cm. longum; ovarium conoideum sulcatum truncatum circ. 6 mm. longum 10-loculare pilis brevibus fasciatis dense tomentosum; stylus glaber sub stigmate lato discoideo lobulato expansus.

ash-grey indumentum as is seen on stems. Flowers in a shortly racemose umbel of some 12 flowers, rhachis puberulous; fertile bracts submembranous oblong acute densely silky on both sides as much as 4 cm. long; bracteoles very short somewhat linear club-shaped hairy from the base and with a white hair-crest; pedicels 3-4 cm. long densely tomentose inserted in middle of obliquely set-on calyx-base. Calyx saucer-shaped about 2 mm. long densely tomentose showing very short inconspicuous marginal teeth. Corolla cream-white with dark basal purple blotch about 3.5 cm. long campanulate slightly oblique fleshy ("glutinous," Ward) 9-lobed; lobes rounded emarginate imbricate about 1 cm. long 1.5 cm. broad. Stamens 18 unequal short little more than half the length of the corolla and shorter than gynaecium; filaments puberulous. Disk glabrous. Gynaecium about 2.5 cm. long shorter than corolla; ovary conoid grooved truncate about 6 mm. long 10-chambered densely tomentose with short besom-like hairs; style glabrous sometimes some hairs at its base expanded under the broad discoid lobulate stigma.

N.E. Upper Burma. Lashi country. Htawjaw, valley of Naum-Chaung. Gnarled tree of 20-30 ft. as above 10,000 ft. Flowers rather glutinous, cream-white with dark purple blotch at base of corolla. Kingdon Ward. No. 1565. May 19, 1914.

We know this plant only in a single specimen of Ward's collection. It is one of the few species of the *Falconeri* series not yet in cultivation.

The region of N.E. Burma and the adjacent one of Western Yunnan have added several species to the *Falconeri* series of *Rhododendron*. We have *Rh. arizelum*, Balf. f. et Forrest, *Rh. basilicum*, Balf. f. et W. W. Sm., *Rh. megaphyllum*, Balf. f. et Forrest, and *Rh. preptum*, Balf. f. et Forrest. *Rh. regale* gives us another. In S.E. Yunnan the series appears in *Rh. sino-Falconeri*, Balf. f., and is represented in N.E. Yunnan in *Rh. Rex*, Lévl., whilst in the N.W. region of Yunnan we have *Rh. fictolacteum*, Balf. f., and *Rh. coriaceum*, Franch.—the latter extending into S.E. Tibet. W. Szechwan gives us one species in *Rh. galactinum*, Balf. f. In all then ten species of this large-leaved series of *Rhododendron* have been made known within recent years from W. China and adjoining areas, more than double the number of those on record from Eastern Himalaya, where Hooker discovered *Rh. Falconeri*, Hook. itself, and *Rh. Hodgsoni*, Hook. f., to which were added *Rh. eximium*, Nutt. and more recently *Rh. decipiens*, Lacaita, making the roll one of four species. Doubtless more members of the series will be discovered in course of further exploration in the wide area of the home of *Rhododendrons*, but as we have it now the *Falconeri* series is a remarkably illustrative example of the wealth in West

China and adjoining countries which recent exploration has brought to us. *Rh. coriaceum* was described in 1898; all the other Chinese forms have come to us during the past decade.

Rh. regale belongs to that set of the Falconeri series in which the underleaf indumentum is always grey—very different from the rusty red or red-cinnamon coloured indumentum that characterises the other species in the series and which is so familiar in the leaves of *Rh. Falconeri*. It shares this type of indumentum with *Rh. coriaceum*, *Rh. Hodgsoni*, and *Rh. Rex*—species it will be observed from widely separate areas—and the conspicuous feature of the indumentum in these forms is not only one of colour but also of the form of the cup-hairs which constitute its upper stratum. These are bowl-shaped (*i.e.* with rounded base) wider or narrower, or funnel-shaped (*i.e.* with pointed base) with wide mouth—the mouth fringed or not—and as they stand side by side upon the leaf surface the mouths of the cup-hairs appear as openings into cavities and the whole surface acquires a foveolate appearance. As the leaf oldens and the time for shedding of these cup-hairs which have thin walls approaches they collapse and look like deflated bladders scintillating on the surface of the grey persistent pellicle of under stratum of indumentum. This is most characteristic and enables one readily to separate the four species in which it occurs from other members of the Falconeri series where the upper stratum apart from colour is more or less woolly. In *Rh. Hodgsoni* only do these cup-hairs become somewhat adpressed to the pellicle beneath and form a somewhat agglutinate scurf. These four species of the Falconeri series so easily recognised by their grey scintillating indumentum may be distinguished thus:—

- | | |
|---|----------------------|
| Cup-hairs of underleaf indumentum bowl-shaped not fringed. | } <i>coriaceum</i> . |
| Corolla rose, spotted, about 3 cm. long. | |
| Stamens 14 puberulous. | |
| Ovary 7-chambered, its hairs floccose. | |
| Cup-hairs of underleaf indumentum bowl-shaped fringed. | } <i>Rex</i> . |
| Corolla rose, spotted, above 4-5 cm. long. | |
| Stamens 16 puberulous. | |
| Ovary 9-chambered, its hairs floccose. | |
| Cup-hairs of underleaf indumentum funnel-shaped fringed. | } <i>regale</i> . |
| Corolla cream-white, blotched purple, about 3.5 cm. long. | |
| Stamens 18 puberulous. | |
| Ovary 10-chambered, its hairs fasciate. | |
| Cup-hairs of underleaf indumentum open shallow cups hardly fringed often agglutinate. | } <i>Hodgsoni</i> . |
| Corolla rose-purple, unspotted, about 3 cm. long. | |
| Stamens about 15 glabrous. | |
| Ovary 9-12-chambered, its hairs woolly. | |

Rhododendron rubrolineatum, Balf. f. et Forrest.* (Trichocladum.)

Shrub about 1.5 m. high with virgate branches. Branchlets thin straight, those of the year finely puberulous and densely lepidote with yellow scales, those a year old about 2 mm. in diameter somewhat rufescent and slightly warted with rufous vestigial scales. Terminal foliage-buds ovoid about 1.2 cm. in diameter reddish-brown; scale-leaves of the foliage-buds all caducous; outermost scale-leaves small about 3 mm. long crustaceous rigid broadly triangular from a wide base keeled and apiculate or only acute outside lepidote, inside more or less silky with adpressed hairs; inner scale-leaves gradually oblong, innermost membranous yellowish browner in middle spatulate about 1.2 cm. long 5 mm. broad, outside towards top lepidote along mid-rib, inside along middle particularly towards top silky with adpressed hairs, margins ciliate with long undulate hairs, summit subtruncate or rounded with many short white marginal hairs; young leaves conduplicate-convolute in the bud, upper surface dark olive-green showing the reddish veins very sparsely lepidote, midrib villous to above middle, margin particularly towards apex with a few very long twisted hairs, under surface bright yellow-lepidote with contiguous scales; petioles of juvenile leaves grooved densely yellow-lepidote with a few long hairs and more or less villous in groove. Mature leaves shortly petiolate about 3.8 cm. long falling after one season; lamina leathery elliptic or oblong-elliptic as much as 3.5 cm. long and 2 cm. broad, apex obtuse or rounded with a short tuberculate hydathodal mucro, margin slightly cartilaginous and recurved obscurely crenulate with notches of fallen hairs, base more or less obtuse; upper surface slightly reticulate

* *Rhododendron rubrolineatum*, Balf. f. et Forrest.—Frutex virgatus ad 1.5 m. altus. Rami tenues stricti annotini puberuli dense lepidoti. Alabastrorum perulae caducae. Folia annua petiolata ad 3.8 cm. longa; lamina coriacea elliptica vel oblongo-elliptica ad 3.5 cm. longa 2 cm. lata apice obtuse mucronata, margine obscure crenulata eciliata, basi obtusa; supra subolivacea glabra (costa media excepta); subtus pallidior discontigue lepidota, costa media minute puberula; petiolus circ. 3 mm. longus lepidotus et puberulus. Flores in umbellas axillares ad apicem ramulorum fasciculatas dispositi; bracteae sub anthesi persistentes; bracteolae filiformes circ. 1 cm. longae pilosae et lepidotae; pedicelli circ. 1 cm. longi stricti plus minusve lepidoti. Calyx brevis circ. 1 mm. longus 5-lobatus; lobi rotundati vel subacuti extus lepidoti margine eciliati. Corolla flavida roseo-lineata postice maculata campanulata circ. 1.8 cm. longa 5-loba; tubus extus plus minusve lepidotus, intus leviter puberulus; lobi circ. 1.8 cm. longi 7 mm. lati oblongi apice rotundati subcrenulati. Stamina 10 corollam subaequantia; filamenta supra basim dense villosa. Discus puberulus. Gynaecium corollam staminaque subaequans vel eis paullo longius; ovarium conoideum imbricatum lepidotum circ. 2 mm. longum; stylus glaber ovario longior. Capsula ovoidea ad 1 cm. longa, 5 mm. lata. Semina minuta fusiformia exannulata.

(dry) glabrous excepting the grooved midrib which is more or less hairy, primary veins about 8 on each side hardly visible; under surface paler, puberulous midrib and primary veins whitish yellow raised very conspicuous, whole surface lepidote with short-stalked rufous or yellowish peltate small discontinuous scales some smaller some larger each scale having a broad umbo and narrow fringe and throughout infiltrated by reddish or yellow secretion, intervals between the scales greater than diameter of scales clad with conspicuous epidermal wax-coated papillae; petiole about 3 mm. long grooved, the groove villous, elsewhere lepidote and at the base more or less puberulous. Flowers in 3-flowered (or 4) axillary umbels solitary in the axils of the uppermost foliage-leaves, 4 or more such umbels in a cluster, no terminal umbel; bracts loosening and falling as flowers expand or remaining as a circlet enclosing base of flower-pedicels, all crustaceous, outermost rounded about 3 mm. in diameter, inner oblong or oblong-elliptic convolute obtuse or truncate lepidote outside white ciliate about 1 cm. long; bracteoles filiform about 1 cm. long pilose from base hair-crested with a few lepidote scales outside; pedicels about 1 cm. long stiff divergent more or less lepidote. Calyx small about 1 mm. long cut almost to base into 5 rounded or subacute lobes, outside more or less lepidote, margin eciliate or with an occasional hair. Corolla campanulate ivory-yellow lined and flushed rose outside, slightly spotted on posterior side, about 1.8 cm. long; tube not grooved expanding into a spreading limb of 5 lobes, outside more or less lepidote, inside faintly puberulous; lobes about 1 cm. long and 7 mm. broad oblong, rounded at apex, margin somewhat crenulate. Stamens 10 unequal about same length as or shorter than corolla, longest about 1.8 cm. long with oblong brown anther about 2 mm. long, shortest about 1 cm. long with globose anther about 1 mm. in diameter; filaments stout slightly wider to base which is naked for about 2 mm. and then densely villous upwards to or short of the middle (higher in the shorter stamens). Disk puberulous below the ovary. Gynaecium about equalling in length or slightly longer than corolla and stamens; ovary conoid imbricately yellow-lepidote about 2 mm. long; style glabrous slightly expanded at apex into a greenish slightly lobulate stigma. Capsule ovoid about 1 cm. long 5 mm. broad brown showing traces of the ovarian scales dehiscing from apex to base by 5 lobes. Seeds very small not 1 mm. long brown fusiform striate without an arillar wing, pointed at chalazal end, slightly protruding at funicular end.

Mid W. Yunnan. Tali Range. Open pasture. Alt. 11,000 ft. Shrub of 2 ft. Flowers creamy (ivory) yellow, lined and

flushed rose on exterior. Very rare! G. Forrest. [Without number.] May 1917.

E. N.W. Yunnan. Kari Pass. On the margins of pine forests. Alt. 12,000 ft. Lat. 28° N. Shrub of 3-5 ft. Flowers canary yellow. G. Forrest. No. 13,914. June 1917.

Yunnan. Without precise locality. Duplicate in fruit. G. Forrest. No. 17,423. Oct. 1918.

One of the *Trichocladum* series and allied to *Rh. melinanthum*, Balf. f. et Ward, from Ka-gwr-pw, from which its leaf-form distinguishes it.

***Rhododendron sidereum*,* Balf. f.† (Grande.)**

Tree as much as 9 m. high with stout branches 8 mm. in diameter when a year old, coated with a dirty grey thin agglutinate indumentum of greasy hairs scaling off on older branches. Foliage-bud large nose bullet-shaped and with many imbricating scale-leaves outside; the outermost scale-leaves (2 or 3) woody short with small rotundate base ending in a long acuminate tail four times or less the length of the base with a floccose tomentum, followed by rounded crustaceous ones gradually becoming oval or oval-oblong earlier ones mucronate later ones emarginate the back clad with very reddened floccose hairs and sticky from immersed glands; innermost scale-leaves petiolate more membranous as much as 4.5 cm. long, the lamina lanceolate acute ending in a long mucro densely tomentose with brown or reddish floccose greasy hairs; young leaves revolute densely tomentose on both surfaces and glandular on under surface. Leaves petiolate as much as 23 cm. long persistent for a couple of years; lamina leathery oblong-lanceolate often slightly curved as much as 21 cm. long 6 cm. broad, acute with a hydathodal apiculus

* *sidereus*, excellent—expressive of the qualities of the plant.

† *Rhododendron sidereum*, Balf. f.—Arbor ad 9 m. alta. Rami breves crassi indumento griseo agglutinato induti. Alabastra oblonga magna perulis plurimis imbricatis oblecta. Folia petiolata ad 23 cm. longa; lamina coriacea oblongo-lanceolata ad 21 cm. longa 6 cm. lata, acuta mucronata, margine paullo recurva, basi obtusa vel late cuneata; supra olivacea subnitens glabra vel in sulco costae mediae pilorum vestigiis notata; subtus argenteo-nitens costa media et venis primariis purpureis, indumento agglutinato persistente e pilis intricatim ramosis et glandulis ovoideis aedificato vestita; petiolus circ. 2 cm. longus agglutinato-tomentosus. Flores in racemo-umbellam plurifloram dispositi, rhachi longa floccosa; bractae extimae crustaceae rotundatae glutinosae, intimae oblongo-spathulatae sericeae; bracteolae breves circ. 5 mm. longae; pedicelli circ. 2 cm. longi albo-tomentosi sub calyce obliqui. Calyx brevissimus. Corolla flavido-alba intus varo basali coccineo notata subcarnosula ad 4 cm. longa oblique campanulata glabra 8-lobata; lobi rotundati emarginati circ. 1 cm. longi. Stamina 16 subaequalia; filamenta tenuia puberula. Discus sparsim puberulus. Gynaecium corolla paullo brevius staminibus longius; ovarium conoideum truncatum sulcatum circ. 7 mm. longum 12-loculare, dense albo-tomentosum eglandulosum; stylus crassus glaber; stigma discoideum recurvum.

ending in a red tubercle, margin cartilaginous slightly recurved, base usually unequal somewhat wedge-shaped or obtuse; upper surface olive-green with darker purple-tinted midrib and primary veins smooth somewhat glossy quite glabrous or showing particularly in the groove of the midrib remains of juvenile floccose hairs as a greyish scurf, primary veins some 15 on each side red-tinted and slightly grooved; under surface silvery shining traversed by the conspicuous raised dark red-tinted midrib and the pinnately spreading conspicuous raised primary veins, midrib and primary veins glabrescent showing only patchy grey vestiges of juvenile indumentum, silvery surface due to an agglutinate persistent indumentum of hairs and glands forming a pellicle some hairs long branched intricately interwoven the ultimate branches somewhat vesicular and often scintillating with a substratum of rosettes of many clustered radiating hairs intermixed with ovoid glands which show on the surface as very minute punctulations, the whole indumentum a typical one of the Grande series; petiole stout about 2 cm. long grooved clad like the stem and glabrescent as it is. Inflorescence terminal forming a racemose cluster of 15 or more flowers, the rhachis as much as 4.7 cm. long floccose with distant short flocks; outer bracts brown crustaceous rounded with thinner margin glutinous, inner bracts oblong-spathulate rounded or truncate mucronate densely silky outside and on midrib towards top inside, about 3 mm. long 1 cm. broad; bracteoles very short about 5 mm. long tapered from the base silky; pedicels 2-2.5 cm. long stout expanding at top into an oblique disk white with a dense close woolly persistent indumentum. Calyx inconspicuous very minute deltoid teeth around oblique disk-like end of pedicel whitely tomentose like the pedicels. Corolla creamy white with crimson basal spots at base of posterior petals somewhat fleshy as much as 4 cm. long obliquely campanulate at the base slightly gibbous retuse glabrous 8-lobed; lobes shallow rounded emarginate about 1 cm. long 1.5 cm. broad. Stamens 16 subequal about half length of corolla, anthers clustering about middle of tube; filaments delicate towards base puberulous with long thin pointed striate hairs; anthers 5 mm. long. Disk sparingly puberulous. Gynaeceum about 3.5 cm. long slightly shorter than corolla longer than stamens; ovary conoid grooved truncate about 7 mm. long with 12 chambers, eglandular, densely whitely tomentose, the tomentum of long stalked fasciate hairs with long undulate and curling non-septate loose spreading branches; style stout glabrous expanded below the large lobulate discoid recurving stigma.

N.E. frontier of Burma. Tamgam. Capt. Abbay. No. 5.
In Herb. Lace.

N.E. Upper Burma. Western flank of the N'Maikha-Salween divide. Lat. 26° N. Alt. 10,000 ft. In thickets and forests. Shrub 8-10 feet. Flowers yellow. In old fruit. G. Forrest. No. 17,860. April 1919.

N.E. Upper Burmah. N'Maikha-Salween divide, western flank. Lat. 26° 15' N. Alt. 9000-10,000 ft. In mixed forests. Flowers clear yellow with a crimson blotch at base. G. Forrest. No. 18,054. May 1919.

N.E. Upper Burma. Hpimaw Hill. Alt. 9000-10,500 ft. A prevailing *Rhododendron* in the upper forest zone. A tree of 20-30 feet just coming into bloom. Reverse of leaves as it were lacquered silver on copper, that dimly sheens through. Flower-head elevated on conspicuous rhachis. Flowers creamy white. Stamens 16. A fine thing. Farrer. No. 872. April 28, 1919.

N.E. Upper Burma. Ridge above Laktang (Kangfang route). Alt. 9000-10,000 ft. Bushy tree of 20 ft. growing on open grassy south-facing slope. Flowers pale creamy yellow, with a small deep purple blotch at base of corolla, nearly regular. Leaves silver beneath. Only one tree seen. F. Kingdon Ward. No. 3061. May 25, 1919.

May 28. Many trees seen between 8000 and 9000 ft. from the beginning of the shrub belt up but they seem to bear very few flowers. Perhaps they do better on N.-facing slopes.—F. K. W.

A beautiful species of the Grande series. The first record of the plant is in Capt. Abbey's specimens which at first were supposed to be *Rh. grande*, Wight, and then were referred to *Rh. arboreum*, Sm. Abbey's specimens have imperfect flowers only. Now we have it in good state from each of the three explorers, Farrer, Forrest, Ward, who have been collecting in N.E. Burma and W. Yunnan within a few miles of each other during last year. The plant comes in the series near the Himalayan *Rh. argenteum*, Hook. f., and *Rh. grande*, Wight, but it wants the glandular ovary of these species.

***Rhododendron tapeinum*,* Balf. f. et Farrer.† (Sulfureum.)**

Shrublet sometimes epiphytic forming an almost prostrate cushion with straight branchlets reddish-brown of short annual

* *ταπεινός*; lowly—in allusion to its habit.

† *Rhododendron tapeinum*, Balf. f. et Farrer.—Suffrutex prostratus pulvinatus nunc epiphyticus. Rami stricti dense setulosi et sparsim lepidoti perulis persistentibus plus minusve vestiti. Folia petiolata ad 2.8 cm. longa; lamina coriacea elliptica vel subovalis ad 2.5 cm. longa 1.5 cm. lata apice rotundata mucronata nunc retusa, margine cartilaginea recurva setulosa, basi obtusa nunc paullo decurrens; supra pallide viridis nitens laevis glabra (costa media sulcata basi excepta); subtus grisea papillis ceriferis baculiformibus dense vestita et squamulis aurantiacis in foveis depressis discontigue lepidota; petiolus

growths about 2 cm. long. Branches a year old densely bristly and with a few peltate gland-like scales about 1.5 mm. in diameter girt at the base by the persistent outer scale-leaves of the foliage-bud, older twigs becoming blackish grey and decortivating in third or fourth year, the outer foliage-bud-scales persisting for several years. Foliage-buds fusiform; outer scales crustaceous brown ovate or rounded, the intermediate oblong keeled and mucronate, inner more membranous spathulate acute, all finely ciliate with occasionally some dorsal scales. Leaves petiolate as much as 2.8 cm. long usually less persistent for two or more years; lamina leathery elliptic or somewhat oval as much as 2.5 cm. long 1.5 cm. broad, apex rounded sometimes retuse with a tuberculate mucro, margin cartilaginous revolute bristly but the bristles often falling each leaving a notch on the margin, base obtuse or sometimes slightly rounded and decurrent; upper surface pale green glossy smooth glabrous except at base of grooved midrib where bristly, primary veins concealed; under surface whitish grey clad with rod-shaped close-set epidermal wax-bearing papillae and lepidote with sunk scintillating orange-coloured discoid scales without a fringe some larger some smaller distance between the scales greater than diameter of scales some 6-7 scales in a square millimetre, midrib pink-tinted raised lepidote at base bristly, primary veins concealed; petiole pink-tinted about 3 mm. long grooved bristly and lepidote underneath, bristly above. Flowers solitary terminal; inner bracts grasping the pedicel until fruit is formed crustaceous oblong whitely ciliate; pedicel barely 1 cm. long not swollen below the calyx, densely bristly and with a few stalked discoid white scales intermixed. Calyx large foliaceous yellow but darker at base about 7 mm. long cut to near base into 5 subequal lobes the posterior pair a little larger; cup at the base bristly and lepidote; lobes with fan-spreading veins glabrous on back, bristly and slightly crenulate at top. Corolla fleshy clear pale lemon-yellow evidently spotted posteriorly, open cup-shaped-campanulate about 2 cm. long lepidote outside with unequal glistening scales, glabrous inside; tube short circular in outline expanding into a broad 5-lobed limb; lobes broad imbricate crenulate

roseo-tinctus subtus setulosus et lepidotus, supra setulosus. Flores terminales solitarii; pedicelli circ. 1 cm. longi stricti erecti dense setulosi et sparsim lepidoti bracteis intimis amplexicaulibus cincti. Calyx foliaceus flavidus circ. 7 mm. longus 5-fissus; cupula setulosa et lepidota; lobi extus glabri ad apicem longe setulosi. Corolla carnosula pallide lutea aperte cupulari-campanulata circ. 2 cm. longa extus squamulis scintillantibus lepidota, intus glabra, 5-loba; lobi lati rotundati. Stamina 10 inaequalia corolla breviora; filamenta supra basim glabram puberula. Ovarium glaber. Gynaeceum staminibus longioribus brevius circ. 1.3 cm. longum; discus circ. 3 mm. longum petasiforme sulcatum truncatum squamulis albidis carnosulis dense lepidotum; stylus glaber validus sub stigmate angusto vix expansus.

about 1 cm. long 1.5 cm. broad. Stamens 10 unequal shorter than corolla, longest about 1.5 cm. long with anther 4 mm. long, shortest about 1 cm. long with anther 3 mm.; filaments stout widened to base glabrous there over about 2 mm. then puberulous to near base of corolla-lobes; anthers orange-red. Disk orange-red glabrous. Gynaecium about 1.3 cm. long shorter than longest stamens; ovary dome-shaped 3 mm. long grooved truncate densely lepidote with white mushroom-like discoid scales; style stout slightly decurved orange-coloured glabrous at top not swollen below the stigma which is narrower than style.

N.E. Upper Burma. Chimili cliffs. Alt. 12,000–13,000 ft. A low almost prostrate cushion in the high alpine granitic precipices opposite the Chimili Pass. Flowers clear yellow, but of no particular charm. Farrer. No. 938. Just coming into bloom May 18, 1919.

N.E. Upper Burma. A western buttress of Imaw Bum. Alt. 10,000 ft. A beautiful dwarf. Epiphytic on an old fir-tree where it formed a compact cushion high up. Flowers pale lemon-yellow with orange-red stamens. Leaves silver-green underneath. Kingdon Ward. No. 3095. May 27, 1919. See No. 3196. Also cf. No. 37.

N.E. Upper Burma. Valley of the Chaung-maw-Lka. Alt. 8000 ft. Dwarf shrub forming a sort of heath on a large mossy boulder in the river bed. Other rhododendrons, a fir-tree, etc., growing on the same boulder. Kingdon Ward. No. 3196. June 6, 1919. Same as No. 3095.

A representative in N.E. Upper Burma of the Mekong-Yangtze species *Rh. megeratum*, Balf. f. et Forrest (see p. 140). They are microforms of one type. This southern form has altogether a dwarfer habit as it is described and at times is epiphytic and has elliptic smaller leaves. The most conspicuous difference is seen in the calyx the lobes of which glabrous in *Rh. megeratum* are crowned by long bristles in *Rh. tapeinum*. In the dried specimens this Burmese plant is hardly so attractive as is the northern species in Forrest's specimens, yet I should expect it to be quite a delightful plant for the rock garden and to this Kingdon Ward's comment, "a beautiful dwarf," may be cited in support. To Mr. Farrer, however, the flowers did not appeal as of any "particular charm."

Rhododendron timeteum,* Balf. f. et Forrest.†

A shrub barely 2 m. high at most with short yearly growths which interlace and evidently form a compact bush. Twigs of

* τιμητέος, to be honoured—in allusion to its value as a garden plant.

† *Rhododendron timeteum*, Balf. f. et Forrest.—Frutex fere ad 2 m. altus ramulis glabris; annotini circ. 2 mm. diam. Folia petiolata ad 7 cm. longa;

the year red, the surface cells unequally impregnated with red secretion giving a finely blotched smooth surface epilose and elepidote (but for perhaps an occasional scale), twigs a year old about 2 mm. in diameter becoming grey smooth glabrous, decortivating usually in the third year. Buds large fusiform few at the ends of the shoots and below the terminal inflorescence; outermost scales crustaceous rounded or broadly ovate sparingly lepidote on back and ciliate, inner ones oblong-ovate densely lepidote and ciliate, innermost membranous spathulate obtuse mucronate greenish with fan-shaped venation lepidote outside and hair-ciliate particularly at top carried up on elongating axis; young leaves conduplicate-convolute becoming revolute as they expand their upper surface glabrous, under surface lepidote, altogether epilose. Leaves petiolate as much as 7 cm. long; lamina thinly leathery oval or elliptic or oblong-oval as much as 6 cm. long 3 cm. broad, apex rounded or obtuse the midrib ending in a tuberculate hydathode not stalked and often deflexed, margin cartilaginous smooth, base rounded or broadly obtuse; upper surface bright green mat smooth glabrous, midrib and primary veins (about 8 on each side of midrib) slightly red-tinted and slightly raised; under surface paler green with a yellowish white glabrous midrib and the rest of venation appearing as a fine sunk reticulation, surface lepidote with brown equal uniformly distributed discontinuous peltate scales each with stalk sunk in shallow pit and a disk with broad concave umbo bounded by an orange-coloured annulus and a whitish-grey narrow fringe, green intervals between the scales wider than the scales which are about 3-4 in a sq. mm.; petiole as much as 1.2 cm. long red-tinted and blotched grooved epilose elepidote or most sparingly lepidote. Umbels solitary terminal usually 4-flowered; bracts early deciduous, unknown; bracteoles linear expanding spathulately at top shortly puberulous throughout at top lepidote on back with a conspicuous white hair-crest about 1.5 cm. long;

lamina tenuiter coriacea ovalis vel elliptica vel oblongo-ovalis ad 6 cm. longa 3 cm. lata, apice rotundata vel obtusa, margine cartilaginea vix revoluta integra nuda, basi rotundata vel late obtusa; supra pallide viridis glabra; subtus epilosa lepidota squamulis discontinuis, intervallis pallide viridibus; petiolus rubro-tinctus ultra 1 cm. longus glaber vel sparsim lepidotus. Umbella plerumque 4-flora; bracteolae lineares apice spathulatae circ. 1.5 cm. longae pilo-cristatae; pedicelli validi 1-2 cm. longi glabri vel sparsissime lepidoti. Calyx parvus circ. 1.5 mm. longus 5-lobus; lobi rotundati extus lepidoti sparsim ciliati. Corolla purpureo-rosea postice coccineo-maculata zygomorpha circa 3.5 cm. longa extus elepidota et epilosa intus puberula; tubus a basi infundibuliformis in limbum latum patentem 5-lobum expansus; lobi lati fere rotundati circ. 2 cm. longi et 2 cm. lati. Stamina 10 inaequalia corollam subaequantia; filamenta deorsum dilatata puberula. Discus sparsim puberulus. Gynaecium corollam et stamina subaequans; ovarium conoideum circ. 6 mm. longum truncatum sulcatum dense lepidotum; stylus basi paullo puberulus sub stigmate discoideo lobulato in labium angustum expansus.

pedicels stout red often unequal in same truss 1-2 cm. long glabrous but for an occasional peltate scale. Calyx small about 1.5 mm. long, the cup glabrous the 5 short (about .5 mm. long) rounded lobes lepidote outside and with a few marginal cilia. Corolla lavender or purplish-rose with deep crimson markings posteriorly, butterfly-shaped about 3.5 cm. long elepidote pilose outside, puberulous inside; tube short wide funnel-shaped from base expanding into a broad open 5-lobed limb hardly grooved inside or ridged outside; lobes of the limb large nearly rotundate subequal as much as 2 cm. long and 2 cm. broad faintly emarginate. Stamens 10 unequal longest about as long as corolla and gynaecium with anther about 3 mm. long, shortest about 2 cm. long with anther about 2 mm. long; filaments dilated downwards puberulous above the glabrous base to above mouth of corolla-tube. Disk nearly glabrous. Gynaecium about as long as corolla and longest stamens; ovary about 6 mm. long conoid truncate grooved densely lepidote; style slightly puberulous at base only slightly expanded and forming a crimson narrow lip below the discoid lobulate stigma. Capsule 1.5 cm. long dehiscent to the base by 5 valves.

S.W. Szechwan. Mu-li Mountains, valley of the Litang. Lat. 28° 12' N. Alt. 11,000 ft. In and on the margins of pine forests. Shrub of 3-4 ft. Flowers purplish-rose with a few dark markings. G. Forrest. No. 16,285. June 1918.

S.W. Szechwan. Mountains around Mu-li. Lat. 28° 12' N. Alt. 11,000 ft. Margins and openings of pine forests. Shrub of 4-6 ft. Flowers pale lavender-rose with deep crimson markings. G. Forrest. No. 16,291. June 1918.

Szechwan rather than Yunnan is the home of the Triflorum series, and this species comes from the extreme S.W. region of Szechwan bordering on Yunnan. It is quite distinct from all of the Yunnan members of the series and from all of the described species from Szechwan, but recalls a plant which is in cultivation sent out by Veitch under the name "*Rh. coombense*." There is no resemblance in this plant to the *Rh. coombense*, Hemsl., described and figured in the Botanical Magazine (1909), t. 8280.

With *Rh. oreotrephes*, W. W. Sm., *Rh. timetum* has alliance, but I see no trace of the wax-covering which is so distinctive a mark of *Rh. oreotrephes* as well as of *Rh. triflorum*, Hook. f., two species which are near relations within the Triflorum series, the latter a yellow-flowered Himalayan, the former a purple-flowered Chinese one. From *Rh. oreotrephes* the new species *Rh. timetum* can be distinguished also by the scales of the underleaf indumentum which in *Rh. oreotrephes* are close-set

stand up like beads upon and give a brown colour to the mature surface but in *Rh. timeteum* are distant leaving wide green areas between.

***Rhododendron trichomiscum*,* Balf. f. et Forrest.†**

Shrub reaching nearly 1 m. high with many straight thin (about 2 mm. in diameter when a year old) nodular branches clad with many red bristle-hairs, annual growth short a little over 1 cm. long producing some 4-6 foliage-leaves rosette-fashion at the top which seem to last but one year, the outermost scale-leaves of the bud falling in the year of expansion occasionally remaining to the end of the season, never persisting to the second year; twigs of the year red soon becoming grey and showing bristles or their wart-scars until decortication. Foliage-buds fusiform pointed; outermost scale-leaves crustaceous with rounded base acuminate or tailed keeled slightly lanate at base and along the margin and on the tail or apiculus, becoming when dry somewhat glaucous on back with slightly recurved margins, followed by more oblong-obovate ones rounded or truncate emarginate and mucronate at top; young leaves revolute in bud. Leaves petiolate as much as 5.5 cm. long; lamina chartaceous narrowly oblong-obovate as much as 5 cm. long 1.5 cm. broad apex obtuse or rounded-obtuse with a very short tuberculate red hydathodal mucro, margin slightly cartilaginous plane or very slightly recurved minutely notched and punctulate with the red bases of fallen hairs or bristles, base narrowed and tapered into a wing on the petiole and there often bearing red bristles; upper surface dark olive-green mat shagreened glabrous, midrib broad grooved with an occasional red bristle and traces of some floccose hairs, primary veins about

* *θρίξ*, hair; *μίσχος*, stem—in allusion to the bristly twigs.

† *Rhododendron trichomiscum*, Balf. f. et Forrest.—Frutex nanus ad 1 m. altus. Rami setiferi plus minusve nodulosi folia 4-6 rosulatin ad apicem gerentes. Alabastrorum perulae mox deciduae. Folia petiolata ad 5.5 cm. longa; lamina chartacea anguste oblongo-obovata ad 5 cm. longa 1.5 cm. lata, obtusa mucronata, margine subplana minute crenulata, basi in petiolum decurrens; supra olivacea in modum squali corii rugulosa glabra (costa media sparsim setifera et floccosa excepta); subtus flavido-viridis vestigiis pilorum floccosorum sparsim vestita, costa media elevata basi setifera; petiolus circ. 5 mm. longus dense setiferus. Umbella 4-6-flora; bracteae extimae caudatae, intimae oblongae sericeae; bracteolae pedicellis breviores; pedicelli circ. 1.5 cm. longi dense glanduloso-setosi. Calyx parvus circ. 2 mm. longus 5-lobus; lobi subaequales persistentes rotundati extus glabri margine setuloso-ciliati. Corolla pallide rosea emaculata circ. 3.3 cm. longa ubique glabra; tubus basi subcarnosulus intus vix costatus; lobi 5 rotundati 1.3 cm. longi 2 cm. lati emarginati. Stamina 10 paullo inaequalia corolla gynaeceoque breviora; filamenta glabra. Discus glaber. Gynaeceum corolla multo brevius staminibus paullo longius; ovarium petasiforme truncatum sulcatum circ. 3 mm. longum dense glanduloso-setosum et floccis paucis fasciatis indutum; stylus glaber.

6-8 on each side very slightly grooved; under surface paler a yellow-green with raised red-tinted midrib clad like the midrib on upper side, general surface shagreened the ultimate veinlets showing as a red impressed network sprinkled with flocks of whitish much-branched adpressed hairs; petiole red-tinted broad about 5 mm. long grooved bristly. Umbel small terminal of 2-4 flowers; flower-bud globose relatively large; outer bracts leathery rounded with a tail as long as the base dark red-brown 1 cm. long or a little more keeled and puberulous outside shortly ciliate, inner bracts oblong densely silky about 1.5 cm. long 7 mm. or more broad cucullate; bracteoles short about 8 mm. long thread-like pilose throughout and white hair-crested; pedicels stout about 1.5 cm. long densely clad with bristle-like red glands densely so at the swollen tip where are also a few fasciate flock-hairs. Calyx persistent small somewhat fleshy about 2 mm. long glabrous outside divided about half way into 5 subequal rounded broad lobes with long marginal bristle-glands. Corolla tubular-campanulate pale rose-pink without markings about 3.3 cm. long glabrous outside and inside; tube slightly thicker at base and retuse with faint inside interpetaline ridges 5-lobed; lobes broad rounded about 1.3 cm. long 2 cm. broad emarginate slightly crenulate. Stamens 10 slightly unequal much shorter than corolla and slightly shorter than gynaecium, longest stamen about 2.3 cm. long shortest about 1.8 cm. long; filaments slightly dilated downwards glabrous, anthers about 2 mm. long. Disk glabrous. Gynaecium about 2.5 cm. long shorter than corolla; ovary about 3 mm. long dome-shaped deeply grooved truncate densely clad with bristle-glands and short glands and a few fasciate flock-hairs; style stout glabrous swollen below the broad discoid lobulate stigma.

S.E. Tibet. Tsarong. On Ka-gwr-pw, Mekong-Salween divide. Alt. 14,000 ft. Lat. 28° 14' N. In cane brakes and rhododendron thickets. Shrub of 2-3 ft. Flowers pale rose-pink without markings. G. Forrest. No. 16,826. July 1918.

Rh. trichomiscum is one of a group of beautiful moorland Rhododendrons discovered by Forrest in the Tsarong district of S.E. Tibet on the slopes of Ka-gwr-pw and Doker-la. The other members of the group are *Rh. eudoxum*, Balf. f. et Forrest,* *Rh. temenium*, Balf. f. et Forrest,† and *Rh. pothinum*, Balf. f. et Forrest (see p. 147 of this story). They are forms which occupy a position amongst Rhododendrons between those which we can assemble around *Rh. sanguineum*, Franch. in a Sanguineum series and those which aggregate about *Rh. neriflorum*, Franch. in a series which has not yet been sufficiently

* Notes R.B.G. Edin., xi (1919), 60.

† Ibid., 146.

studied for prescription of limitation. When describing *Rh. eudoxum* I placed it as an aberrant form of the Sanguineum series. When describing *Rh. temenium* I emphasised its relationship to *Rh. neriiflorum*. In *Rh. pothinum* and *Rh. trichomiscum* we have now two new forms which add to our data for framing phyletic lines, but I am not to discuss them in detail here. There is still a mass of related material of Forrest's collecting that requires analysis before sound deductions are possible. I will only say that these new species are closely allied to the forms already known and show the same character intermediate to *Rh. sanguineum* on the one side and *Rh. neriiflorum* on the other. The prominent character of relation—one which appears at sight—is that of the underleaf indumentum which in *Rh. eudoxum* is a thin white veil of interwoven floccose hairs—only requiring thickening to represent fairly well a typical Sanguineum series indumentum—which is more or less detersile and in *Rh. pothinum* is absent altogether from the first and so we are taken to *Rh. neriiflorum*.* Additional material which has reached us from Forrest since the date of my previous writing on this subject enables me to establish as a character possessed by all of the four species here mentioned the development of bristles on the young stems, leaf-petioles, and even on the lamina-bases. These bristles sometimes disappear early and this explains omission of mention of them in the description of *Rh. eudoxum*. In that species as in the others they occur. In a key which I framed of diagnostic marks between some of the members of the Sanguineum series,† *Rh. eudoxum* is included and occupies an isolated position, and to shorten my writing the following extension of that portion of the key which refers to *Rh. eudoxum* will suffice to bring out the relation between it and its three allies of which we have been speaking, and with which it forms without question a subsidiary phylum between that of *Rh. sanguineum* and that of *Rh. neriiflorum* :—

Underleaf surface grey-green, glabrous.

Scale-leaves of the bud falling at expansion.

Stems, petioles and midrib in part red-setulose eglandular.

Pedicels and ovaries densely fasciate-floccose eglandular.

Calyx 3 mm. long; cup and lobes glabrous on back; lobes deep red floccose-ciliate persistent.

Corolla campanulate dark rose unspotted.

Staminal filaments glabrous.

Style shorter than corolla *pothinum*.

* See Notes R.B.G. Edin., xi (1919), pp. 76, 123.

† Ibid., 80.

Underleaf surface yellow-green sparingly floccose or glabrescent.

Scale-leaves of bud falling at expansion.

Stems and petioles red-setulose with floccose substratum.

Pedicels and ovaries with setulose-fasciate and floccose substratum; ovaries floccose shortly glandular.

Calyx 1 cm. long; cup and lobes glabrous on back; lobes dark red floccose-ciliate persistent.

Corolla tubular-campanulate deep crimson unspotted.

Staminal filaments glabrous.

Style longer than corolla

temenium.

Underleaf surface yellow-green sparingly floccose.

Scale-leaves of the bud falling at expansion.

Stems, petioles and midrib in part red-setulose eglandular.

Pedicels and ovaries fasciate-floccose setulose glandular.

Calyx 2 mm. long; cup and lobes glabrous on back; lobes pale-coloured floccose-ciliate persistent.

Corolla tubular-campanulate pale rose-pink unspotted.

Staminal filaments glabrous.

Style shorter than corolla

trichomiscum.

Underleaf surface yellow-green with a thin veil of floccose hairs.

Scale-leaves of the bud falling at expansion.

Stem, petioles and midrib red-setulose and shortly glandular often glabrescent.

Pedicels and ovaries shortly glandular.

Calyx 7 mm. long; cup floccose and glandular on back; lobes red glabrous on back, floccose and gland-ciliate deciduous.

Corolla tubular-campanulate dark rose sparingly spotted.

Staminal filaments puberulous.

Style equalling in length corolla

eudoxum.

Amongst the typical members of the Sanguineum series *Rh. trichomiscum* finds a resembling form in *Rh. cloiophorum*, Balf. f. et Forrest. In form and tint of foliage they are much alike and that *Rh. cloiophorum* within its phylum does not retain the scale-leaves of its foliage-buds so markedly as is seen elsewhere finds an echo in *Rh. trichomiscum* where the scale-leaves sometimes persist to the end of the season of formation. The flower-colour in the living plants is the same—rose according to Forrest's description—and in both when dried the flowers fade to a yellowish tint so evident that without the regulating statement

of the man on the spot a describer of the dried specimens would not be blameable had he given yellow as the flower-colour. There is no risk of confusion of the two species if the underleaf indumentum be looked at, *Rh. cloiophorum* having the typical white to buff-coloured bistrata indumentum of the Sanguineum series, and it has no bristle-hairs on the stem.

Rhododendron trichophorum, Balf. f.* (Triflorum.)

Loosely branched shrub forming a few longer erect virgate branches. Branches of the year bright green scaly with yellowish scattered scales conspicuous beneath many white bristle-hairs; branches a year old about 3.5 mm. in diameter becoming brown the scales as blackish warts and the bristles blackening and persisting for many years. Foliage-bud oblong-ovoid pointed; outermost scale-leaves crustaceous rounded or broadly triangular keeled and mucronulate more or less ciliate; inner oblong or ovate; innermost thinner strap-shaped spathulate hooded blunt or rounded shortly mucronulate about 1.5 cm. long 5 mm. broad at the top; all more or less silky inside, scaly with yellowish peltate scales outside, more or less ciliate; young leaves conduplicate-convolute ciliate, both surfaces scaly, the upper also puberulous and bearing bristles with the midrib slightly depressed and puberulous, the under surface densely hairy on midrib. Leaves petiolate as much as 9.5 cm. long; lamina thinly leathery ovate or oblong-ovate as much as 9 cm. long 3.5 cm. broad narrowed to an acute tip with a prominent red hydatheal mucro, margin cartilaginous slightly recurved, base cordulate or subtruncate; upper surface opaque dark green, when young usually red the red tint often remaining on the leaves in their second year, slightly shagreened distantly black spotted with remains of juvenile peltate scales also most minutely puberulous, the

* *Rhododendron trichophorum*, Balf. f. — Frutex laxo ramosus nunc ramoso virgato emittens. Rami hornotini laete virides lepidoti et pallide setosi, annotini 3.5 mm. diam. brunnei squamis et setis nigricantibus. Alabastra oblonga acuta; perulae intimae ligulatae circ. 1.5 cm. longae 5 mm. latae intus sericeae, extus lepidotae, ciliatae; folia juvenilia conduplicata-convoluta. Folia petiolata ad 9.5 cm. longa; lamina tenuiter coriacea ovata vel oblongo-ovata ad 3.5 cm. lata, apice acuta, margine leviter recurvata, basi cordulata vel trunculata; supra opaca viridis vel erubescens squamis nigris peltatis distantibus obscure conspersa minutissime puberula, costa media puberula; subtus pallidior squamis luteis inter se ad 1 mm. distantibus, costa media prominula puberula sparsim setulosa; petiolus puberulus et dense setosus circ. 5 mm. longus. Umbella 4-flora; bracteolae filiformes pedicellis breviores; pedicelli virides lepidoti et setosi circ. 2 cm. longi. Calyx circ. 1.5 mm. longus lepidotus et ciliatus. Corolla zygomorpha plus minusve infundibuliformis violacea postice albida et viridi-maculata 5-loba, ad 4 cm. longa extus pilosa; tubus albedo-roseus intus puberulus. Stamina 10 inaequalia corollam subaequantia; filamenta supra basim villosa. Discus puberulus. Gynaecium corolla longius; ovarium lepidotum pilo-cristatum; stylus basi pilosus; stigma kermesinum parvum.

midrib slightly grooved with a puberulous ridge in the groove, primary veins some 9 on each side pinnately radiating; under surface paler scaly with yellowish peltate scales about 1 mm. apart each with a broad umbo and narrow fringe, hairless except on the prominent midrib which is puberulous and bristly, primary veins slightly prominent; petiole short and broad about 5 mm. long puberulous and densely bristly also with a few peltate scales, slightly grooved above. Flowers in terminal usually 4-flowered umbels; bracts falling as flowers expand; bracteoles filiform with spatulate apex about 1.5 cm. long shorter than pedicels, hairy on back and scaly on underside of broader tip; pedicels green about 2 cm. long scaly and bristly with white bristles. Calyx small cup-shaped or saucer-shaped about 1.5 mm. long green scaly and hairy outside the 5 lobes rounded or pointed longer than the cup with long marginal white cilia. Corolla of butterfly-form with funnel-shaped laterally compressed tube which is pinkish passing into white at base of posterior petal, the limb rich violet (hortense-violet) with a white area on posterior petal and many green spots, as much as 4 cm. long; tube fleshy deeply grooved outside at base specially on each side of posterior petal correspondingly ridged inside, more or less pouched the posterior petal much more so than the others, inside puberulous in the throat, expanding obliquely into 5-lobed limb; lobes ovate or oblong-ovate obtuse posterior erect broadest as much as 2 cm. long 1.8 cm. broad entire. Stamens 10 unequal, longest about equalling corolla some 4 cm. long with anther 3.5 mm. long, shortest about 2 cm. long with anther 2 mm. long; filaments flushed pink slightly dilated downwards, base naked over about 3 mm. then with a tuft of villous hairs, hairless above; anthers ochre-coloured. Disk puberulous below the ovary. Gynaeceum about 4.5 cm. long a little longer than corolla; ovary about 4 mm. long conoid truncate densely scaly hair-crested; style pink hairy at base slightly swollen and forming a narrow crimson lip below the discoid lobed crimson stigma.

Szechwan. Muping. Wilson. No. 4242.

Rh. trichophorum has appeared in several individuals along with true *Rh. villosum*, Hemsl. et Wils., in a sowing of Wilson's No. 4242. That number is cited in *Plantae Wilsonianae* for *Rh. villosum* from Muping and *Rh. trichophorum* may be taken therefore to be a Muping plant. It is not *Rh. villosum*. The two plants are very different in appearance and can be readily separated by technical characters. The old leaves are hairless on the upper surface not covered with bristles as in *Rh. villosum* and not puberulous beyond the midrib below as the leaves are in *Rh. villosum*; the calyx is ciliate with bristle-hairs but not villous with them all over; the corolla has a pink tube passing

into white lepidote and hairless outside with a violet limb not a deep-red tube lepidote and hairy outside with purple limb; the style is hairy not glabrous at base. When *Rh. trichophorum* first showed amongst our plants of *Rh. villosum* it had the aspect of a form of *Rh. Augustinii*, Hemsl., and it resembles that species more than it does *Rh. villosum*. But *Rh. Augustinii* never has the copious bristles on the stem and leaves which characterise *Rh. trichophorum*, and in particular has the pedicels without bristles; the underleaf peltate scales of *Rh. Augustinii* are distant from one another by about the diameter of the scales, sometimes a little more but rarely more than half a millimetre apart, while in *Rh. trichophorum* they are about 1 mm. distant. There are other differences also.

Rh. Amesiae, Rehd. et Wils., is another Muping plant of this affinity. As described in *Plantae Wilsonianae* it shows conspicuous differences from *Rh. villosum* in the warted not bristly surface of the stem bristles being present only on the petioles and in the hairless outer surface of the corolla. A specimen under the type number Wilson 3444 in Kew Herbarium kindly lent to me by the Director of Kew corresponds with the description and there is growing at Kew a plant which I have seen (not in flower) which in vegetative characters is this *Rh. Amesiae*. But at Edinburgh we have a specimen in our herbarium under the type number Wilson 3444 which has the stems clad with bristles. The same has to be said of the pedicels. In other characters it matches well Rehder and Wilson's plant. It would appear therefore that Rehder and Wilson's species may have either warted or bristly stems and pedicels. The dried material at Kew and Edinburgh is scrappy and does not suffice for much critical comparison of the two forms. If *Rh. Amesiae* has sometimes bristles on the stem it is linked more nearly with *Rh. trichophorum* but is yet distinct from it. Two characters—one strong the other less so—may be given as distinctions. The under surface of the leaf is in Rehder and Wilson's words "densissime lepidota et ferruginea." The peltate scales which are of different sizes are not quite contiguous but always closer together than the diameter of the scales. In *Rh. trichophorum* the under surface of the leaf is pale green the peltate scales which are nearly uniform in size being distant usually as much as 1 mm. apart as they are in *Rh. villosum*. This gives a diagnostic mark recognisable at sight. The other character referred to is in the corolla which has the tube villosulous inside whilst in *Rh. trichophorum* there are only a few short hairs.

In *Rh. trichophorum* is added another to a small phylum within the Triflorum series marked by the presence of bristles more or less developed over the shoots and also on the pedicels.

The other members of the phylum are *Rh. Augustinii* (1889)—after which as the longest described species we may call it the Augustinii phylum—*Rh. villosum* (1910), *Rh. Amesiae* (1913), and *Rh. Vilmorinianum* (1919). These are in cultivation. Another species of the phylum, *Rh. chasmanthum*, Diels (1912), is not in cultivation.

***Rhododendron vicarium*, Balf. f.* (Lapponicum.)**

A much-branched shrub with erect twiggy branches. Branches a year old about 1 mm. in diameter scurfy with rusty peltate scales aggregated together. Foliage-buds ovoid enwrapped in few scale-leaves; outermost scale-leaves crustaceous broad ovate about 1 mm. long rusty lepidote outside ciliate; intermediate somewhat rounded silky inside; innermost of parchment consistence pale yellow elliptic or oblong-oval boat-shaped about 4 mm. long rounded or obtuse at apex sparingly

* *Rhododendron vicarium*, Balf. f.—Frutex multiramis ramis erectis virgatis. Ramuli annotini circ. 1 mm. diam. squamis peltatis rufis congestis squarrosi. Alabastra foliorum ovoidea perulis paucis involuta; perulae extimae crustaceae latae ovatae acutae circ. 1 mm. longae dorso rufo-lepidotae ciliatae, intermediae subtundatae intus sericeae, intimae pergamentaceae flavidae ellipticae vel oblongo-ovales scaphoideae apice rotundatae vel obtusae dorso sparsim rufo-lepidotae ciliatae ad apicem squameo-fimbriatae circ. 4 mm. longae. Folia petiolata ad 1.1 cm. longa; lamina crasse coriacea oblongo-ovalis vel ovalis vel oblongo-ovata ad 9 mm. longa 3 mm. lata apice obtusa vel rotundata nunc mucronulata margine paullo recurvata basi late obtusa; supra atroviridis opaca squamis peltatis contiguis arescentibus induta, squamarum umbone lato plerumque incolorato, instita aequilata translucente, costa media vix sulcata; subtus fulvo-rufa squamis bicoloratis commixtis contiguis (sed saepe intervallo angusto nudo separatis) indumentum bistratum facientibus vestita, squamis nonnullis strati superi rufis ex umbone lato secretione pleno institaque nitente aequilata aedificatis, aliis strati inferi incoloratis, costa media paullo prominula; petiolus ad 2 mm. longus similiter ac caulis lepidotus. Flores 1-2 ad apicem ramulorum fere sessiles; bractae paucae sub anthesi plus minusve persistentes, exteriores crustaceae rotundatae cucullatae carinatae mucronulatae dorso rufo-lepidotae margine tenuiores ciliatae, intimae membranaceae pallide brunneae oblongae vel obovato-oblongae circ. 6.5 mm. longae 3.5 mm. latae dorso lepidotae et puberulae lanato-ciliatae; pedicelli vix 1 mm. longi dense lepidoti. Calyx minutissimus vix 0.5 mm. longus cupularis lobos 5 rotundatos vel dentiformes exhibens extus dense lepidotus; lobi squameo-fimbriati. Corolla caeruleo-violacea circ. 1.3 cm. longa extus lepidota pilosa; tubus campanulatus circ. 2.5 mm. longus fauce intus puberulus supra in limbum concavum 5-lobatum amplius; lobi oblongi vel oblongo-ovales vel ovales ad 8 mm. longi 5 mm. lati obtusi undulati. Stamina 10 corolla breviora alternatim longiora et breviora, longiora circ. 9 mm. longa antheris circ. 1 mm. longis; filamenta deorsum latiora supra basim nudam intra tubum corollinum villosa. Discus puberulus. Gynaeceum circ. 7 mm. longum corolla staminibusque brevius; ovarium cylindricum angustum 2 mm. longum paullo sulcatum dense imbricatum flavescenti-lepidotum; stylus purpureo-ruber glaber rectus sub stigmatate lobulato atropurpureo discoideo paullo amplius. Capsula erubescens squamarum vestigiis oblecta angusta oblonga circ. 4 mm. longa 1.75 mm. diam. valvis 5 ab apice ad basim dehiscens.

rusty lepidote outside ciliate, at the tip scale-fringed. Leaves petiolate as much as 1.1 cm. long; lamina thickly leathery oblong-oval or oval or oblong-ovate as much as 9 mm. long 3 mm. broad with an obtuse or rounded apex here and there mucronulate, the margin slightly recurved, broadly obtuse at base; upper surface dark green opaque clad with peltate contiguous drying-up scales each with a broad umbo usually uncoloured and an equally broad translucent fringe, midrib scarcely grooved; under surface tawny rust-coloured clothed with contiguous peltate scales but often with a narrow naked interval between forming a bistrate indumentum, some scales rust-coloured of an upper stratum with a broad umbo full of secretion and an equally broad scintillating fringe, others equally mixed of a lower stratum uncoloured, midrib slightly prominent; petiole as much as 2 mm. long lepidote like the stem. Flowers 1-2 at the apex of the shoots, nearly sessile; bracts few more or less persistent during flowering; outer ones crustaceous rounded hooded keeled mucronulate rusty-lepidote outside margin thinner ciliate; innermost membranous pale brown oblong or obovate-oblong about 6.5 mm. long 3.5 mm. broad lepidote and puberulous outside woolly-ciliate; pedicels barely 1 mm. long densely lepidote. Calyx most minute barely 0.5 mm. long cup-shaped 5-lobed; lobes rounded or tooth-like densely lepidote outside scale-fringed. Corolla blue-violet about 1.3 cm. long lepidote and pilose outside; tube campanulate about 2.5 mm. long puberulous in the throat expanding into a concave 5-lobed limb; lobes oblong or oblong-oval as much as 8 mm. long 5 mm. broad obtuse undulate. Stamens 10 shorter than corolla, alternately long and short, longer about 9 mm. long with anther 1 mm. long; filaments broadened downwards and villous within the tube of the corolla above their naked base. Disk puberulous. Gynaeceum about 7 mm. long shorter than corolla and stamens; ovary cylindric narrow 2 mm. long slightly sulcate densely imbricately yellowish-lepidote; style red-purple glabrous straight slightly expanded under the lobulate dark purple discoid stigma. Capsule reddened covered by the vestiges of peltate scales narrow oblong about 4 mm. long 1.75 mm. in diameter dehiscing by 5 valves from apex to base.

W. Szechwan. Tatsienlu. Fleurs bleu-violet. J. A. Soulié. No. 2772. Juin 27, 1894. In Herb. Paris.

Rh. vicarium is not a Yunnan species. As a Tatsienlu plant it takes one for a comparison to the known forms from Szechwan. These are (with their discoverers' names):—*alpicolum* (Wilson) and its var. *strictum* (Wilson), *blepharocalyx* (Soulié), *Edgarianum* (Wilson), *fastigiatum* (Wilson), *flavidum* (Soulié), *intricatum* (Soulié), *nitidulum* (Wilson) and its var. *nubigenum* (Wilson),

polifolium (Soulié), *psilostylum* (Wilson), *ramosissimum* (Wilson), *verruculosum* (Wilson), *Websterianum* (Wilson), *violaceum* (Wilson). Is the plant described here as *Rh. vicarium* not one of these? If not, how does it differ?

For future reference I will take those species successively in alphabetical order:—

Rh. alpicolum.—Is an intricately branched plant not virgate as is *Rh. vicarium*. Note, however, var. *strictum* is virgate. Is one of the punctulate Lapponicums and has scattered rufous scales over the underleaf surface of flavescent contiguous scales not the nearly equal distribution of rufous and paler scales sometimes hardly contiguous of *Rh. vicarium*. Its flowers are solitary but note in the var. *strictum* they are 2–3 in a truss. Its calyx has unequal oblong lobes 2 mm. long sparingly ciliate, in the var. *strictum* equal all ovate and 1.5 mm. long, very different from the hardly developed about 0.5 mm. long calyx of *Rh. vicarium* which is eciliate and scale-fringed. Its corolla is funnel-shaped, glabrous outside, with a tube 4 mm. long and lobes broadly ovate or obovate whilst in *Rh. vicarium* the tube is campanulate 2.5 mm. long lepidote outside and the lobes oval or oblong-oval. Its ovary is conic not narrow cylindric. Its style is pilose at base with a capitate stigma, glabrous however in var. *strictum*; in *Rh. vicarium* glabrous with a discoid stigma. Its capsule is ovoid not narrowed oblong. *Rh. vicarium* cannot be placed in *Rh. alpicolum*.

Rh. blepharocalyx.—Here we have a grey uniform shining tomentum, the corolla has a long tube and is elepidote, the stamens are 5, the style shorter than the ovary. Altogether a different plant.

Rh. Edgarianum.—So far as underleaf indumentum goes that of this species shows sometimes an approach to that of *Rh. vicarium* but is more commonly uniform. *Rh. Edgarianum* has nearly globose not ovoid foliage-buds. Its leaves are broadly ovate or broadly oval and always under 1 cm. in length, in *Rh. vicarium* they are oval or oblong-oval or oblong-ovate and reach 1.1 cm. long. Flowers are solitary not in pairs. Bracts are deciduous not persistent during flowering. Calyx is membranous purpling or yellow-green with 5 oval oblong obtuse or acutish lobes 2–2.5 mm. long and 1–1.5 mm. broad and ciliate, below the middle lepidote; very different from the minute lepidote and scale-fringed calyx about 0.5 mm. long of *Rh. vicarium*. Its corolla is funnel-shaped elepidote with a tube 5 mm. long and broadly ovate or obovate lobes not campanulate lepidote with a tube 2.5 mm. long. Its stamens 8 not 10. Its ovary conic with a style longer than the stamens and bearing a capitate stigma, not cylindric with style shorter than stamens and bearing a

discoid stigma. Its capsule ovoid not narrow oblong. *Rh. vicarium* cannot be identified with *Rh. Edgarianum*.

Rh. fastigiatum.—I have not seen the plant from near Tatsienlu which Rehder and Wilson identify as *Rh. fastigiatum*, Franch., and am disposed to doubt the identification on the ground that Franchet's species in all the specimens of it which I have seen is a Yunnan plant only. One may have a clue to Wilson's plant in Rehder and Wilson's identification of Franchet's *Rh. capitatum* with it. That is a point I have not yet investigated. There is more than one species in the Paris Herbarium under the name *Rh. capitatum*. Even if *Rh. fastigiatum* be a Tatsienlu plant it is not *Rh. vicarium*. At a glance it can be separated by the discontinuous scales of its uniform underleaf indumentum so different from the bi-coloured state of *Rh. vicarium*, and then it has 3-5 flowered trusses not 1-2 and a large membranous calyx not a nearly obsolete one; 10 long stamens longer than not shorter than corolla; a long exserted style exceeding the stamens not included and shorter than the stamens; an ovoid not narrow oblong capsule. *Rh. vicarium* is very different.

Rh. flavidum as a yellow-flowered species is readily separated from *Rh. vicarium*.

Rh. intricatum differs from *Rh. vicarium* in the same characters as does *Rh. blepharocalyx*, only it has 10 stamens.

Rh. nitidulum.—Is a much broader-leaved species than *Rh. vicarium* and the prominent scintillating scales of the upper-leaf indumentum are characteristic and give the leaf a different look from the opaque surface with its drying-up scales in *Rh. vicarium*. Its hardly contiguous uniform underleaf scales are a contrast to the bi-coloured scales in *Rh. vicarium*. It has a membranous calyx with unequal lobes 2 mm. long sparingly ciliate at apex whereas the calyx of *Rh. vicarium* is nearly obsolete and has no cilia but is scale-fringed. Its funnel-shaped corolla elepidote outside with tube about 5 mm. long and oval obovate lobes 1 cm. long is a different construction from the campanulate corolla lepidote outside with tube about 2.5 mm. long and oblong or oblong-oval lobes 8 mm. long in *Rh. vicarium*. Its conic ovary with style longer than stamens contrasts with the cylindric ovary and style shorter than stamens in *Rh. vicarium*, as does its capitate stigma with the discoid stigma of *Rh. vicarium*. Soulié's No. 2772 is certainly not *Rh. nitidulum*.

Rh. nitidulum var. *nubigenum* differs chiefly from the type in having smaller leaves and larger calyx and by so much is more different from *Rh. vicarium*.

Rh. polifolium.—As I am for the moment in difficulties over this species I cannot write from observation. A Paris specimen in Edinburgh Herbarium under the name is not the plant and

is perhaps a new species. I can therefore only compare *Rh. vicarium* with Franchet's description of his species *Rh. polifolium* and this I now do. Franchet says nothing about indumentum but places *Rh. polifolium* near *Rh. thymifolium*. If that be so one would expect the underleaf indumentum to be grey or brown of contiguous scales and punctulate. The punctulation is not very prominent in *Rh. thymifolium* however and might be missed even by Franchet who first noticed it in *Rh. nigropunctatum*. Certainly *Rh. thymifolium* indumentum is very different from the bi-coloured fulvo-rufous indumentum of *Rh. vicarium* and our Paris specimen under *Rh. polifolium* (that name has been substituted for *thymifolium* on the ticket) shows the silver-grey shining under surface without punctulation such as is seen in the Subseries C* of the Lapponicum series, in which was included *Rh. polifolium* on the evidence of this Paris specimen. Flowers in *Rh. polifolium* are in a fascicle of 2-3, more often 2; there are many floriferous buds side by side at the ends of the branchlets without interposed leaves; the inflorescence is lateral like that of *Rh. racemosum*, Franch. only more contracted. (This I do not find in the Paris specimen hence my interpretation that Franchet did not mean to speak of a fascicle; † perhaps I am quite wrong, for the Paris specimen apart from this has a quite short style shorter than stamens, whilst true *Rh. polifolium* has a long one far exceeding the stamens.) Taking *Rh. polifolium* as having a fascicled inflorescence according to description this is very different from the solitary and paired flowers terminal in *Rh. vicarium*. Then *Rh. polifolium* true has exserted stamens and style far exceeding stamens, in *Rh. vicarium* the stamens are shorter than corolla and the style is shorter than the stamens. Calyx-lobes in *Rh. polifolium* are ovate or ovate-deltoid 1-2 mm. long and ciliate, whilst in *Rh. vicarium* there is the obsolete scale-fringed eciliate calyx. Certainly *Rh. vicarium* is not the *Rh. polifolium* of Franchet's description.

Rh. psilostylum is easily separated by its indumentum and yellow flowers.

Rh. ramosissimum.—Rehder and Wilson's plant from Tatsienlu is not the true *Rh. ramosissimum*. What it is I cannot yet say—possibly a new species. But *Rh. vicarium* is not Franchet's *Rh. ramosissimum* having a puberulous corolla-throat and it is not Rehder and Wilson's species a comparison with which will be made at some other time.

Rh. verruculosum.—This species has pilose as well as lepidote twigs, *Rh. vicarium* has only lepidote ones. The leaves are oval or elliptic-ovate, in *Rh. vicarium* oblong-oval or oval or oblong-

* See Notes R.B.G. Edin., ix (1916), 310.

† Ibid., l.c.

ovate. Upper surface has scales "flavidis lucidis"—the surface is opaque in *Rh. vicarium*. Scales on under surface not contiguous and dark-coloured ones are scattered evidently punctulate in *Rh. verruculosum*, in *Rh. vicarium* equally distributed. Flowers solitary, but 2 in *Rh. vicarium*. Calyx-lobes ovate or rounded 1-2 mm. long densely villous-ciliate, in *Rh. vicarium* obsolete scale-fringed. Corolla funnel-shaped with tube 4 mm. long but in *Rh. vicarium* tube campanulate 2.5 mm. long—in both corolla is lepidote. Stamens 7-8 not 10. Ovary conic not cylindric. Style much longer than stamens, not shorter as in *Rh. vicarium*. Stigma capitate not discoid. Quite distinct from *Rh. vicarium*.

Rh. Websterianum is one of the silvery underleafed forms with large flowers and long exserted style. It is not like *Rh. vicarium*.

Rh. violaceum.—Has the same habit. Leaves are sometimes acute never in *Rh. vicarium*. Flowers 1-3, in *Rh. vicarium* usually 2. Petiole 2-3 mm., the maximum is 2 mm. in *Rh. vicarium*. Calyx-lobes 0.5-2 mm., ovate or rounded on a cupular base, ciliate at apex but as in *Rh. vicarium* the margin is lepidote and often scarious, in *Rh. vicarium* I have not seen a scarious margin nor cilia and the lobes are nearly obsolete the whole calyx barely 0.5 mm. long. Corolla funnel-shaped glabrous outside, tube 4-5 mm. long, in *Rh. vicarium* tube campanulate 2.5 mm. long and corolla lepidote. Ovary conic not cylindric. Style exceeding stamens not shorter. Stigma capitate not discoid. Capsule ovoid not oblong 5 mm. long not 4 mm. *Rh. vicarium* is nearest to this species but is distinct. From the specimen and description I take the main differences to be:—

Leaves larger and more glossy in *Rh. vicarium*.

Calyx-lobes much smaller 0.5 mm. long and more lepidote and fleshy eciliate.

Corolla-tube shorter 2.5 mm. campanulate. Corolla lepidote not glabrous outside puberulous not villous inside.

Ovary much smaller narrow cylindric.

Style shorter than stamens.

Capsule narrowly oblong.

The type of *Rh. violaceum* I have seen is Wilson No. 3460, and there are two distinct plants under the number—one with discontinuous underleaf indumentum is certainly not the *Rh. violaceum*.

Rhododendron Vilmorinianum, Balf. f.* (Triflorum.)

An erect bush in cultivation with rigid straight stiff thin branches. Branchlets of the year barely 1 mm. in diameter

* *Rhododendron Vilmorinianum*, Balf. f.—Frutex erectus ramis strictis rigidis tenuibus. Ramuli hornotini vix 1 mm. diam. puberuli et sparsim setulosi sigillatim lepidoti, annotini puberuli et sparsim lepidoti et setulosi erubescens. Folia petiolata oblongo-lanceolata ad 6 cm. longa; lamina ad 5 cm. longa 1.8 cm. lata acutim attenuata et longe mucronata, margine crenulata ciliata, basi obtusa;

finely puberulous and with a few scattered twisted bristles also lepidote with white large adpressed seal-like peltate uniform scales .25 mm. in diameter irregularly distributed some discontinuous others contiguous year-old branchlets reddening the scales becoming reddish or yellowish. Foliage-bud ovoid narrowed to top shorter and thicker than in *Rh. Augustinii* finely puberulous and sparsely lepidote solitary terminal or forming an apical cluster, last foliage-leaves close beneath the bud which has several outer leaves intermediate to foliage and true scale-leaves (each with an axillary bud), outer scale-leaves short rounded or broadly ovate or broadly triangular, pointed shortly acuminate not caudate, more or less puberulous and lepidote outside, followed by oblong or long oval or ovate scale-leaves becoming gradually more convolute the inner of which have distinct midrib and are most lepidote on both sides of it; innermost green enclosing the concave erect slightly convolutely overlapping young foliage-leaves which have a few peltate scales scattered on each side of midrib of epilose upper surface save for puberulous midrib and the under surface epilose lepidote with white seal-like scales almost contiguous, the margin with a few long twisted hairs; petiole puberulous and with a few long setulose hairs. Leaves petiolate as much as 6 cm. long stiff horizontally spreading; lamina chartaceous oblong-lanceolate as much as 5 cm. long 1.5 cm. broad tapered to an acute point ending in a prominent red-topped apiculate mucro, margin cartilaginous notched sparsely bristly-ciliate or eciliate flat or obscurely recurved, base obtuse; upper surface dark green often becoming dark purple-red mat flat not bullate but finely rugulose and minutely papillose epilose excepting the grooved puberulous midrib, primary veins some 8 or 9 on each side hidden, lepidote with a few blackish or reddish distant peltate scales about the midrib, intervals between the scales much wider than the scales (about 1 in a sq. mm.), scales often difficult to see in old leaves; under surface pale green becoming slightly tawny lepidote with many brown nearly uniform peltate scales filled with reddish secretion discontinuous, intervals between the scales about width of scales (3-5 in a sq. mm.) midrib elevated paler and like rest of supra atroviridis nunc purpureo-rubra opaca plana haud bullata epilosa (costa media sulcata puberula excepta) squamis distantibus sparsim lepidota; infra pallide viridis nunc subfulva epilosa squamis rufis discontiguis uniformibus lepidota, costa media elevata glabra; petiolus circ. 1 cm. longus puberulus et sparsim lepidotus, margine setulosus. Flores in umbellas solitarias terminales 3-floras dispositi; pedicelli vix 1 cm. longi squamis albidis discontiguis lepidoti. Calyx parvus. Corolla zygomorpha alba varo flavo basali et maculis aurantiacis notata extus sparsim lepidota epilosa; lobi undulato-lobulati. Stamina 10 inaequalia corollam vix aequantia; filamenta pubescentia; antherae kermesinae. Gynaecium staminibus longius corollam subaequans; ovarium lepidotum pilocristatum; stylus basi puberulus.

surface epilose, primary veins invisible; petiole about 1 cm. long commonly reddish finely puberulous and sparingly lepidote its margin bristly with twisted bristles. Flowers in a terminal 3-flowered umbel; flower-bud globular ovoid smaller than in *Rh. Augustinii* solitary with a cluster of small foliage-buds one in each leaf-axil below and close up to it; bracts falling as the flowers open, inner bracts at time of fall brown crustaceo-membranous oblong truncate apiculate cucullate outside lepidote puberulous, margin ciliate, inside more or less silkily adpressed hairy, about 1.2 cm. long 6 mm. broad; bracteoles filiform at first white then brown membranous about 1.3 cm. long longer than pedicel adpressed hairy throughout on back and towards top sparingly lepidote hair-crested; pedicels short green about 8 cm. long 1.5 mm. in diameter densely but discontinuously white lepidote with small scales, not expanding into the calyx-cup set on straight or only slightly oblique to axis of flower. Calyx green lepidote outside lobes sometimes faintly tinted ochre at top; cup about 1 mm. long somewhat fleshy 5-lobed; lobes unequal postero-lateral largest elongated triangular or oblong obtuse or deltoid as much as 1.5 mm. long often less, anterior lobes minute teeth on margin of calyx-cup, margin ciliate. Corolla butterfly-shaped but not conspicuously so greenish in bud at first yellowish-white then white with ochre-coloured spots posteriorly inside on disk of limb, about 3.5 cm. long lepidote all over outside with distant white peltate scales epilose, puberulous inside at base of disk of limb; tube oblique funnel-shaped about 5 mm. long in front, longer behind, slightly laterally compressed about 1.5 mm. in diameter at base and there slightly fleshy and gibbous especially posteriorly, deeply grooved outside and correspondingly ridged inside expanding upwards into a concave limb with 5 spreading recurving lobes; disk of the limb somewhat rugose; lobes oval or oblong oval with beautifully undulate almost fringed margin subequal a little over 2 cm. long and nearly 2 cm. broad. Stamens 10 unequal, longest barely as long as corolla about 3.3 cm. long with anther about 2.5 mm. long, shortest about 2.3 cm. long with anther 1.5 mm. long all spreading not so declinate as usual in the *Triflorum* series; filaments white slightly dilated downwards glabrous at base over 3.4 mm. then hair-tufted and densely pubescent above the ovary filling up base of concave limb of corolla, glabrous above; anthers crimson. Disk green with a dense fringe of hairs at top. Gynaeceum about 3.5 cm. long a little longer than stamens and about same length as corolla; ovary about 2.5 mm. long and 1.5 mm. in diameter conoid angular green lepidote with translucent white small scales hair-crested at top; style delicate greenish-yellow glabrous but with a very few short

hairs on it above the ovarian hair-crest slightly clavate at top with a green lip under the small flat green lobulate stigma which is hardly as broad as the style.

Raised by M. de Vilmorin from seed probably collected by Farges in E. Szechwan.

This is a plant which seems to pass commonly in gardens as the white-flowered form of *Rh. Augustinii*, Hemsl. There is a figure of it in *Flora and Silva*, iii (1905), 162. The plant is not *Rh. Augustinii*. Everyone who has grown *Rh. Augustinii* knows the character by which the species is readily recognised—the downy midrib on the under surface of the leaves which surface is otherwise lepidote but not hairy. Search for it in *Rh. Vilmorinianum* is vain. There then is a technical diagnostic mark between the species. It is one that can be seen at all times making easy recognition of plants not in flower. But it is by no means the only distinctive mark. The two plants are altogether different in habit. *Rh. Vilmorinianum*, whether grown in exposed situations outside or under shelter in a cool plant-house is a stiff erect shrub with straight diverging branches bearing stiff horizontal leaves with flat upper surface in the growing season, and during the resting period the leaves are often stiffly deflexed on petioles about one centimeter long, whilst *Rh. Augustinii* is a flexuously branched shrub with leaves usually convex above and drooping on petioles about half a centimeter long. The flower-buds are globular ovoid and stand up well above the leaves during the resting period, surrounded below by a small cluster of small vegetative buds; in *Rh. Augustinii* the flower-buds are ovoid pointed much narrower and longer and the vegetative buds below are longer. The inflorescence is in all the plants seen a 3-flowered umbel never rising to 6-flowered as in *Rh. Augustinii*, in which too there may occur a fascicle of umbels at the end of the branch, and the pedicels are short about one centimeter (or under it) long not 1.5–2 cm. The corolla as it elongates from the bracts is more or less green and changes through a yellowish-white to white with ochre-coloured spots posteriorly on the disk and the lobes are beautifully undulate almost fringed; in *Rh. Augustinii* the corolla shoots out with a lilac or blue tint and when expanded has the same tint with green spots and the undulations on the lobes are less pronounced. The stamens barely equal the corolla in length in *Rh. Vilmorinianum* not longer than the corolla as is usual in *Rh. Augustinii*, and the anthers are crimson not pink.

Whether there is in cultivation another white-flowered plant which is truly a form of *Rh. Augustinii* I do not know. The plant here described certainly differs from *Rh. Augustinii*.

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