Vol. I., No. V., 1919.

The Rhododendron Society Notes.

REPRINTED BY
THE PACIFIC RHODODENDRON SOCIETY

Acknowledgements

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RHODODENDRON, CAMELLIA
& MAGNOLIA GROUP

A ROYAL HORTICULTURAL SOCIETY GROUP

2017

THE PACIFIC RHODODENDRON SOCIETY

"Dedicated to the Hobbiest and Home Gardeners"

Foreword

The Pacific Rhododendron Society has reprinted the Rhododendron Notes in an effort to further the knowledge of the Genus Rhododendron by those enthusiasts with an avid interest in the history, exploration and biographical sketches contained herein.

The Rhododendron Notes are offered to the end that the reader may more easily understand the progress encouraged by those who contributed the wealth of information contained in these volumes, thereby making clear our understanding of the Genus Rhododendron today.

The Society wishes to gratefully acknowledge the efforts on our behalf by the following persons and organizations: Dr. R. Shaw, Curator and M.V. Mathew, Librarian of the Royal Botanic Garden Edinburgh, Scotland, for providing the missing numbers; Lord Aberconway and John Cowell, Secretary of the Royal Horticultural Society, for certain photocopies and other considerations, Sir Giles Loder and Sir Edmund de Rothchild for their esteemed counsel, and to Thomas V. Donnelly our printer.

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The Pacific Rhododendron Society
1976

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The Rhododendron Society Notes.

NOTES

CONTRIBUTED BY

MEMBERS OF THE SOCIETY

FOR THE YEAR

1919

All communications regarding the publications of the Rhododendron Society should be made to Charles Eley, East Bergholt, Suffolk.

Vol. I., No. V., 1919.

The Rhododendron Society Notes.

MEMBERS' NOTES FOR THE YEAR 1919.

INDEX TO VOL. I., PART IV.

To facilitate its consideration at the earliest possible date, a Note by George H. Johnstone, suggesting research regarding old and the registration of new hybrids of Rhododendrons was, with his consent, circulated amongst the members of the Society in the Spring of 1920. Reference to this Note is made here for the purpose of record.—C. C. E.

SOME LARGE-LEAVED RHODODENDRONS.

In response to the request of the Secretary of the Society, I am to write about "Some Large-leaved Rhododendrons," not that I imply his prescription of the subject, but it happened that during the autumn I had been working out some of Forrest's large-leaved forms which seemed to form a basis for such an article as was desired. Anyone writing on this theme a few years ago would have had a limited field of species to pass in review. To name R. ARGENTEUM, *Hook. f.*, R. EXIMIUM, *Nutt.*, R. FALCONERI, *Hook. f.*, R. GRANDE, *Wight*, R. HODGSONI, *Hook. f.*, all Himalayan species is to complete the list of forms then known. Now we are in touch with more than five times the number, chiefly through the exploration of Western China; the Himalayas have yielded so far but one additional name, R. DECIPIENS, *Lacaita*. And we are not yet at the end of them either in China or in the Himalayas. The forms from the latter region have still to be critically sifted. From China the later months of the year have brought to Mr. J. C. Williams from Forrest advance material of three or four new species, the last one to arrive (in only a few leaves as yet) under the apt name R. GIGANTEUM, for its description tells that it is a tree about 80 feet high with a bole 7 feet 9 inches in girth at 5 feet from the ground. We learn from all the specimens of Rhododendron that have come to us that the development of large leaves has happened in more than one phylum of the genus. In some phyla they are only occasional, in others dominant, and it is the latter which include the Himalayan species mentioned above and which come to mind when large-leaved Rhododendrons are referred to.

In 1853 Nuttall brought together the Himalayan Rhododendrons with large leaves in a group of the genus to which he gave the name Sciadendron, and he recognised correctly the associated characters of small calyx, bell-shaped corolla with 8-10 lobes, 12-18 stamens and 12-18-chambered capsule. This grouping was followed in the Genera Plantarum and also in the Flora of British India. Our extended knowledge of the genus shows us that this grouping is partially phyletic. Members of two phyla are included in Sciadendron—R. EXIMIUM, R. FALCONERI and R. HODGSONI belong to one phylum, R. ARGENTEUM and R. GRANDE to another. We may designate the first of these phyla the Falconeri Series, the latter the Grande Series, after the oldest-named species included in each. It was to have been my task to endeavour to associate with these older known species the newer ones with which we have become acquainted and to indicate salient features characterising these series and distinctive of the several species belonging to them, but the number of species claiming attention that have come upon the horizon have compelled me to restrict the performance of my task to an account of one Series only—the Falconeri Series—leaving the GRANDE and other Series to be dealt with on some other occasion.

THE FALCONERI SERIES.

RHODODENDRON FALCONERI itself is so well known to all who are interested in Rhododendrons that with assurance I may ask readers of this story to keep

this species before them as a typical illustration of the characters by which the Falconeri Series is distinguished. These are :—

VEGETATIVE CHARACTERS. Shrubs or trees with stems and branches from which the bark flakes off leaving a pinkish tinted or cinnamon-coloured, often somewhat glaucous surface. The young branches stout, when young tomentose, the tomentum white to rich brown. The leaves thick and large ; oval, oblong-oval, or oboval, or oblanceolate, rounded at top ; blunt, rounded, cordate or tapered at the base ; the margin often recurved. Rough wrinkled more or less reticulate on the dark or paler green upper convex surface, when expanding coated there with a tomentum which usually falls off leaving no trace, or persists as a withered coating. Clothed on the concave under surface which is often alveolate with tomentum which varies from dark brown to whitish-grey and is composed of two strata. An upper stratum of cup-shaped stalked hairs, the stalks of many cells—their form varying from broad open bowls through bell-shaped to funnel-shaped chalice or vase types, broad or narrow at the mouth which may be merely slightly wavy or be prolonged into a short fringe or have long streamer-like hair-branches passing out from it. According to the shape of the cup the cells composing its wall differ. Isodiametric in the bowls and bell-shaped cups they are elongated vertically in the narrower funnel-forms. And then in some of the larger funnels or chalices additional hair-branches may spring from the stalk and from the wall of the cup as well as from the margin of the mouth. The construction of these cup-hairs accounts for the differences observable on the under-surface of the leaves. When they are open bowls without or with very slight marginal fringe, and these are characteristic of the grey-coloured indumentum, the surface seems to have a number of isolated pits over it, and when the cells of the cup-walls dry and wrinkle they scintillate prismatic colours ; where there are cups with extended marginal branches these by their interlacing give the woolly look so characteristic of many species, and this is common in the brown and cinnamon-coloured indumentum. As the leaf oldens one of two fates befalls these cup-hairs. They may persist unchanged save in darkening of colour, and the leaf-surface to the end retains its earlier character. This in particular where the indumentum is woolly. Or the cup-hairs may fall off sometimes over the whole surface save at the sides of the midrib and primary veins—this very marked where the indumentum is grey—and as this process of depilation proceeds the separate individual hairs, somewhat shrunken it is true, may be easily recognised, their isolation in the younger stages of the leaf is in the woolly leaves not always easily descried. When the hairs of the upper stratum fall off the under stratum comes into view always as a smooth greyish or white pellicle. It is never detersile and consists of rosette-hairs on short stalks, the unicellular branches always short and varying in number and taking on a vesicular character as they olden when the branches of adjacent hairs become agglutinated and thus create a close surface-skin over the leaf. This understratum is present also on the leaves from which the cup-hairs do not fall, and can be readily made visible by scraping off the upper stratum. I dwell on these characters of indumentum because the cup-hair is diagnostic of the Falconeri Series. I know of it in no other series. It gives an easily ascertained character by which to separate members of the Falconeri

Series from those of the Grande Series. But I interject this warning : the under surface of the leaf of one of the Falconeri Series which has detersile indumentum may in the older stages, when the smooth grey pellicle of under-stratum is visible all over it, present some resemblance to the under surface of the leaf of one of the Grande Series. Careful examination, however, will always show a few of the cup-shaped hairs lurking under protection of the midrib or primary veins and prevent mistake in identification.

Everyone knows the conical terminal bud which appears in R. FALCONERI in the midst of the circle of leaves. It takes its shape from the few outer scale-leaves enclosing it. These have thick cushion-bases from which the long tapered sharp-pointed upper part of the scale-leaf is prolonged, the tips often slightly twisted around one another. Within these outer scale-leaves are the oblong overlapping ones sealing the bud. This type of bud is if not characteristic of the Falconeri Series as a whole, certainly conspicuous in the largest-leaved forms in it. We do not know the buds in several of the species and on our young plants of R. GALACTINUM the outer bud-scales of the terminal foliage-bud are short. I do not say it is not to be found elsewhere—we know so few species of Rhododendron as yet in their mature state. This form of bud may be either a foliage-bud or a flower-bud. I know of no mark by which to make a sure prognosis of the destiny of a terminal bud in the Falconeri Series until it begins to swell in growth. The lateral buds are different from the terminal. They never have these outer tailed scale-leaves. They are foliage-buds. Yet on occasion I have seen one of these lateral buds develop into a flower-truss whilst the terminal became a foliage-shoot.

THE FLOWER AND FRUIT. We are justified in making the broad statement that large truss and large flower are characters of the Falconeri Series, some are less large than others. The truss is a more or less racemose umbel, the pedicels are long and tomentose, the bracts silky, the bracteoles very short. The oblique form of the flower with a more convex slightly ventricose upper side and set on at a conspicuous angle to the pedicel is characteristic. The calyx is hardly visible, only a series of small teeth usually representing it. The corolla fleshy bell-shaped is most commonly creamy-white or pale-yellow with some degree of crimson blotching at the base on the posterior side within and sometimes spotted above the blotch, occasionally the crimson-coloration is absent, frequently the corolla is rose or rose-pink, more rarely carmine to purple. The corolla is mainly tube, the lobes, eight to ten, rarely seven, are relatively short and overlap, in the end recurving more or less. The stamens, from 14 to 20, are always much shorter than the corolla, are unequal in size and bunched around the style, their filaments slightly widened to the base and either puberulous or without hairs bear dark-coloured anthers rather small for the size of flower. The ovary-chambers vary in number from 7 to 18, and the outer surface may be glandular only, the glands short stalked and very sticky, or have glands and tomentum mixed or may be only tomentose and profusely so, this last the commonest condition ; and the hairs of the tomentum are differential, usually some form of fasciate hair with long or short stalk and varying form of branches, or flock-like hairs with fat, short pointed branches. The style which is stout, shorter than the

corolla and always curved upwards at the top, is glabrous but in species which have a glandular ovary the glands may extend for a short distance up the lower part of the style. The stigma is a broad, flat or concave disc distinctly grooved on the top into many segments. The capsule always slightly curved shows on the outside the remains of the ovarian covering, and dehisces from apex to base by valves of unequal breadth, sometimes narrow of one carpel, sometimes broader of two or more carpels united together. I have not seen the valves falling away entirely from the central septal column. The brownish seeds, some 3 mm. or more in length, are flattened and always have a circumferential winged aril as well as a more or less developed crest or fringe at both the chalazal and the hilar extremities.

Of plants belonging to the series of which we have knowledge sufficient to entitle us to describe them as species, there are 14, and the following is a list of them :—

Name and date of description.	Distribution.	Discoverer.
R. ARIZELUM, *Balf. f. et Forrest* (1920)*	W. Yunnan : Shweli-Salween divide, 11-12,000 ft.	Forrest (1917)
	N.E. Upper Burma : Hpimaw Pass, 95-10,500 ft.	Farrer (1919)
R. BASILICUM, *Balf. f. et W. W. Sm.* (1916)	W. Yunnan : Shweli-Salween divide, 11,000 ft.	Forrest (1913)
R. CORIACEUM, *Franch.* (1898)	N.W. Yunnan : Mekong-Salween divide.	Soulié (1893)
	S.E. Tibet : Doker-la, 12,000 ft.	Forrest (1917)
R. DECIPIENS, *Lacaita* (1916)	W. Sikkim, 10-11,000 ft.	Lacaita (1913)
R. EXIMIUM, *Nutt.* (1853)	Bhutan : Oola Mts., 10-11,000 ft.	Booth (before 1853)
R. FALCONERI, *Hook. f.* (1849)	Bhutan	Griffith (1837-38)
	Sikkim, 10,000 ft.	Hooker f. (1848)
R. FICTOLACTEUM, *Balf. f.* (1916)	N.W. Yunnan, both East and West.	Delavay (1886)
	S.W. Szechwan : Mu-li Mts., 12-13,000 ft.	Forrest (1918)
R. GALACTINUM, *Balf. f.*	W. Szechwan	Wilson (1910)
R. HODGSONI, *Hook. f.* (1849)	Bhutan	Griffith (1837-38)
	Sikkim, 10-12,000 ft.	Hooker f. (1848)
R. MEGAPHYLLUM, *Balf. f. et Forrest* (1920)*	W. Yunnan : Shweli-Salween divide, 10-11,000 ft.	Forrest (1918)

* Description of this species will appear in an early number of Notes from the Royal Botanic Garden, Edinburgh.

Name and date of description.	Distribution.	Discoverer.
R. PREPTUM, *Balf. f. et Forrest* (1920)* ..	N.E. Upper Burma : N'Maikha divide, 11,000 ft.	Forrest (1919)
R. REGALE, *Balf. f. et Ward* (1920)*	N.E. Upper Burma : Htawjaw, Valley of Naum-Chaung, over 10,000 ft.	Ward (1914)
R. REX, *Léveillé* (1914) ..	N.E. Yunnan : Mt. Io-chou, 3,200 m.	Maire (1911)
R. SINOFALCONERI, *Balf. f.*.. (1916)	S.E. Yunnan : N. of Mengtsz, 9,000 ft.	Henry (before 1898)

RHODODENDRON ARIZELUM, *Balf. f. et Forrest.*

This species was discovered by Forrest in June, 1917, at an elevation of 11-12,000 feet, on the Shweli-Salween divide in Western Yunnan. He describes it as a shrub attaining some 20 feet in height bearing fleshy pale-yellow flowers with rose or crimson at the base. The specimens first collected and also those of a later gathering in July, 1917, are in full flower, suggesting therefore a late-flowering species for our gardens when it comes into cultivation, as it will from Forrest's seeds. Plants of the species were found in April, 1919, by Farrer, as one of the prevailing Rhododendrons at 9,500-10,500 feet elevation on the Hpimaw Pass in N.E. Upper Burma, a station not far to the west of Forrest's area of collecting, and he speaks of it as a low many-branched tree with thick trusses of dead creamy-white flowers, without scent, just coming into flower on April 20th. Its flowering period would appear to be a prolonged one. The leaves of the species are smaller—at most in our specimens 18 cm. long by 8 cm. broad—than in some of the members of the series, with the wrinkling of the upper surface only slightly developed. The underleaf surface is smooth, densely covered all over (midrib and primary veins included) in a bright rusty indumentum which seems to be very persistent. The cup-hairs of the upper stratum of indumentum are of the funnel-type with short pluricellular stalk and the cup-wall is built up of elongated cells and is ridged by bands of thicker-walled ones, from which and from the margin of the cup many branches proceed. So many of these branches are there the cup-form sometimes is obscured. The general surface is a woolly one through interlocking of these hairs. The flower-truss has some 15 or more flowers, when young forming a globose bud. The corolla is of fair size about 4.5 cm. long and 8-lobed. The filaments of the 16 stamens are slightly puberulous above the base. The ovary has 12-15 chambers, its outside densely clad with short-stalked branched hairs forming a close tomentum, each hair comparable in form to a pollard willow with stem and erect ascending branches. The ovary is never glandular. The capsule is curved about 3.5 cm. long and 1 cm. in diameter with orange-coloured tomentum. The species is the nearest approach amongst the Chinese forms to R. FALCONERI of the Himalaya, much nearer than the plant named R. SINOFALCONERI. It is, however, as are all

* Description of this species will appear in an early number of Notes from the Royal Botanic Garden, Edinburgh.

the Chinese species of the Falconeri Series (except R. EXIMIUM), distinguished from R. FALCONERI by its eglandular ovary. Its cup-hairs, quite of the type of those of R. FALCONERI, are smaller than in that species.

RHODODENDRON BASILICUM, *Balf. f. et W. W. Sm.*

Since his first finding of this species in 1912 on the Shweli-Salween divide at 11,000 feet elevation, Forrest has met with it on several occasions in the same region. From the earlier collecting plants have been raised, which ought to flower within a few years from now, giving us trusses of fleshy pale-yellow flowers. The plant is described as a bush of 10-30 feet. The species has leaves as large as or larger than those of R. FALCONERI itself, 25 cm. long by 13 cm. broad, wrinkled above but not so deeply honeycombed below as in that species. The underleaf indumentum is pale cinnamon-coloured, the hairs of the upper stratum beautifully developed as funnel-shaped cups with stout stalk expanding into a cup-wall of vertically elongated cells, the cup-margin spreading as a fringe, the segments of which run out into long fibril-like hairs, of which there may be many. This hair-stratum seems to be fairly persistent, falling off only in patches when it does disappear, and it gives the surface a slightly woolly look. The flower-truss is large with some 25 flowers in each, of which the corolla is not of the largest in the series, about 3.5 cm. long. The 16 stamens have glabrous filaments (occasionally a hair or two) and the 12-15-chambered ovary is without glands, but densely covered by cinnamon-coloured fasciate hairs with conspicuous stalks. The capsule, slightly curved, is as much as 4 cm. long and 1.25 cm. broad, and is coated with brown tomentum.

R. BASILICUM is a larger-leaved plant than R. MEGAPHYLLUM its nearest ally, and has different underleaf indumentum, its cup-hairs funnel-shaped with more developed fringe, an ovary with more chambers and a fruit nearly twice the size of that found in R. MEGAPHYLLUM.

RHODODENDRON CORIACEUM, *Franch.*

(*syn.* R. FOVEOLATUM, *Rehder et Wilson*).

Soulié discovered this species in April 1893 at Loukiong near Tseku on the Mekong in N.W. Yunnan. The next record of it is in specimens collected near Tseku and sent home in 1912 by Monbeig. Monbeig's specimens in Kew Herbarium were described by Rehder and Wilson in PL. WILSONIANÆ I (1913) 537 as R. FOVEOLATUM, a name in which they stereotype the appearance of the underleaf indumentum, the cup-like feature of which they recognised. By Forrest also the plant has been found about Tseku, and in 1917 he extended our knowledge of its area of distribution by finding it at an elevation of 12,000 feet on Doker-la in the Tsarong to the N.W. of the previously known stations. Forrest describes the plant as a shrub of 12-20 feet, and the flowers as white flushed-rose with a basal crimson blotch from which radiate upwards crimson spots. The species is marked by two prominent characters, one foliage and one floral—the underleaf indumentum is grey-white, and the corolla has seven lobes. The leaves are long and narrow as much as 28 cm. long and some 6-7 cm. broad,

rarely more and often much smaller, and they are oblanceolate, tapering gradually from apex to base. Frequently they are deflexed on the branch. The upper stratum of underleaf indumentum consists of shallow open bowl-shaped hairs with rounded somewhat bell-shaped base on short pluricellular stalks, the cells of the walls isodiametric and the margin of the bowl without a fringe of branches. It is these open bowls which give the foveolate surface remarked upon by Rehder and Wilson. They are deciduous more or less and leave exposed the whitish pellicle of under-stratum agglutinate rosette-hairs. In R. REX we have the same kind of cup-hairs, and in R. HODGSONI and R. REGALE the form is nearly approached, only in them the base of the bowl is somewhat funnel-shaped, not bell-shaped. The flower-truss is small for the series though there may be as many as 15 flowers. The corolla is small, about 3 cm. long, and the spotting on the rose surface is conspicuous. The filaments of the 14 stamens are most minutely puberulous. The ovary is 7-chambered, the chambers wide with very narrow septa, and outside the ovary is densely coated with peculiar fleshy stalked flock-like few-branched hairs (the branches curling on themselves) which are most distinctive. The curved capsule is narrow, about 3 cm. long, 6 mm. in diameter, sparsely clad with red-brown hairs.

Forrest got seed of this in 1918, if not before, and we may expect therefore to have the plant in cultivation. The young shoots on the dried specimens resemble somewhat those of R. NIVEUM, *Hook, f.*, but that species has no close phyletic relation.

RHODODENDRON DECIPIENS, *Lacaita.*

In May 1913 Lacaita collected in flower in Western Sikkim the plant which he names thus at an elevation of 10-11,000 feet, adding to his own specimens a fruiting one collected later in the year by Ribu for the purpose of his description in the Journal of the Linnean Society, of December, 1916. He describes it as arborescent with leaves elliptic or obovate-elliptic, at base narrowed or subcordate, 20-22 cm. long, 9-11 cm. broad, rugose above (but less so than in R. FALCONERI) ferruginously tomentose below when young, the upper layer detersile leaving a pale as it were lepidote indumentum not altogether unlike that of R. HODGSONI. Flower-truss 25-30-flowered. Corolla of the form and purple-rose colour of R. HODGSONI. Staminal filaments pilosulous. Ovary tomentose. Capsule 4-5 cm. long, 10-13 mm. broad, intermediate in size to the capsules of R. HODGSONI and R. FALCONERI. "On the spot," he says, "I assumed this, from its colour and general appearance, to be a variant of R. HODGSONI, amongst which it grows promiscuously." On his return he saw more of R. FALCONERI in it, and concludes that whilst approaching R. HODGSONI in foliage the shape of the capsule makes it impossible to assign it to a form of R. HODGSONI, and that it would seem to be rather an undescribed variant of R. FALCONERI with purple-rose (not flesh-coloured) flowers and smaller capsule. It was growing too copiously in its home to be regarded as a hybrid of R. FALCONERI and R. HODGSONI.

I have not examined thoroughly Lacaita's specimens which are now in Kew Herbarium, and indeed their detailed investigation could be pursued usefully only if R. FALCONERI and R. HODGSONI in their several forms were passed in

review at the same time. For that I have not found time as yet, and I doubt if there be sufficient material in the country for the study. But I am indebted to the Director of Kew for kindly supplying me with portions of Lacaita's flowering specimen (No. 464), and of his fruiting specimen which I have analysed, and they show that the plants to which they belong are distinct forms within the phylum. The fruiting plant collected by Ribu, in October, 1913, is only assumed by Lacaita to be his flowering R. DECIPIENS gathered some months earlier, and his qualification is justified. The fruit character attached to R. DECIPIENS does not belong to it. Ribu's fruiting plant is in underleaf indumentum near to R. FALCONERI with perhaps some divergence. In R. DECIPIENS Lacaita saw correctly features of R. HODGSONI in the underleaf indumentum. His words " quasi-lepidotum " refer to the characteristic agglutinate isolated cup-hairs such as are found in R. HODGSONI. These cup-hairs in R. DECIPIENS are many of them those of R. HODGSONI or very near them, but they are mixed with others that recall those of R. FALCONERI, and there would seem to be therefore constructional ground for the suggestion that we have here a natural hybrid. Much more investigation is required before a certain opinion on this question can be expressed. Meanwhile I introduce here Lacaita's R. DECIPIENS as one of the Falconeri Series without further comment, but would suggest that growers of R. FALCONERI and R. HODGSONI should look at their plants for forms which may match this one. One hears of the occurrence of purple and rose-coloured flowers on plants which have the porte of R. FALCONERI but which are not R. EXIMIUM and it may be that amongst these R. DECIPIENS will be found, for the profusion of the plant in its habitat favours the possibility of the inclusion of its seeds in packets of those of its comrades.

RHODODENDRON EXIMIUM, *Nutt.*

[Figured as R. FALCONERI VAR. EXIMIUM in BOT. MAG. (1893) t. 7317].

R. EXIMIUM, discovered before 1853 by Booth " growing amidst ice and snow," at an elevation of 10-11,000 feet in forests on the rocky ridge and spurs of the Oola Mountains in Bhutan, and forming a stately tree 30 feet in height, is a plant of cultivation with which Members of the Society will have better acquaintance than I have, for we have no large plants of it at Edinburgh. It is an offshoot from the immediate phylum of R. FALCONERI, and there is the question, often discussed, should it be treated as a distinct species or as only a variety of R. FALCONERI? If we knew more of the aggregate we call R. FALCONERI we should be in better position to appraise the value of characters. The combination of prominent characters upon which I have relied in the past for diagnosis of R. EXIMIUM are these; the persistently bearded petioles, the rose or pink-tinted flowers, and the densely glandular ovary without any indumentum hairs and with the glands extending upwards for some distance over the lower part of the style. To these another derived from the cup-hairs of the underleaf indumentum has to be added. In R. EXIMIUM these are sessile long slightly funnel-shaped narrow tubes, the wall composed of much elongated narrow thickish-walled cells and not forming a uniformly bounded mouth to the tube, but split and divided irregularly into coarse much-branched fringed

segments which end in single filaments, often fibril-like, that interlace to make the woolly surface. In R. FALCONERI these cup-hairs are much shorter, more tumbler-shaped, with a wall of less elongated cells, but fringed in a similar manner. The state of our knowledge at this time seems to me to warrant our following Nuttall in treating R. EXIMIUM as a species, and considerations of practical convenience in the garden lead to the same determination. No one seeing R. EXIMIUM and R. FALCONERI, as they are known in our gardens, would call them the same, and have we not the authority of so trenchant a critic of the ways of the Botanist in regard to plant-nomenclature as "W. W." for saying that the gardener abominates botanical varietal names and makes them specific if he can, so that R. FALCONERI var. EXIMIUM has become and will as I think justly remain to the gardener, R. EXIMIUM? It is as Mangles pointed out long ago an illustration of the divergence in form that is met with in Sikkim species as one travels eastwards. In Bhutan it represents the Sikkim R. FALCONERI as in other series, R. ARGENTEUM is represented by R. GRANDE, R. AUCKLANDII by R. GRIFFITHIANUM, and so on.

RHODODENDRON FALCONERI, *Hook. f.*

[Figured in Rhod. Sikkim Himal. (1849) t. X; Fl. des Serres V. (1849) t. 477-480, XI. (1856) t. 1166-1167; Regel, Gartenfl. (1870) t. 659; Bot. Mag. (1856) t. 4924.]

Everyone interested in Rhododendrons knows this species figured by Hooker from plants collected by him in 1849, at an elevation of 10,000 feet, at Tonglo, in Sikkim, and through him the species came into general cultivation. Before Hooker's time it had been grown from seeds sent home by Col. Sykes. (Lacaita records that in 1913 he could find no R. FALCONERI on the top of Tonglo.) Since then seeds under the name have been sent home frequently. Hooker recognised the great variability of his species, but no Botanist as yet has sifted the variations. So far the only names that have been given to forms that belong to the aggregate R. FALCONERI are :—

(*a*) R. VENOSUM by Nuttall to a Bhutan plant found by Booth which has a white underleaf tomentum and which he says "appears to have come up in several collections with the seeds of R. FALCONERI distributed by Dr. Hooker." Sir Wm. Hooker in the BOTANICAL MAGAZINE sunk the species in R. FALCONERI, and there it has remained.

(*b*) R. EXIMIUM by Nuttall to the position of which and its distinguishing characters I have referred above.

(*c*) R. DECIPIENS by Lacaita of which I have also written above. Lacaita also refers to another plant with "flowers crimson in bud" belonging to the series.

A comprehensive and detailed survey of R. FALCONERI is necessary to give us bedrock for segregation of the forms and determination if possible of natural hybrids, and until that comes no useful purpose can be served by discussion. I will only note here that in this most hardy plant the cup-hairs of the underleaf indumentum in the type Hookerian specimen of R. FALCONERI have a distinctive form. They are nearly sessile, and the cup is elongated to a shape somewhat

like that of a tumbler, often with slightly bulging base, having a wall of but slightly elongated cells and the mouth is somewhat ragged and split into fringed segments which are not greatly prolonged. There is in consequence less holding together of the hairs by interlocking of the branches than is found in some other species, and the cup-hairs of the older leaves readily separate from one another as little granules. As regards the flower, Hooker f. in 1893 when writing of R. EXIMIUM pointed out that the plant which he found on Tonglo, and described as R. FALCONERI, was an aberrant starved one with small pure white flowers without a basal purple blotch, not the creamy or yellow-white blotched form that is commonly associated with the plant. I find that the filaments of the usually 16 stamens are sometimes quite glabrous, sometimes puberulous; that the many-chambered (I find usually 16 chambers) ovary has a covering of glands some on long some on short stalks, and this glandular character distinguishes R. FALCONERI and its microforms from all other members of its series. In most typical forms the ovary has a dense tomentum of fasciate hairs with long cylindric branches so many as to cover entirely the glands which, however, indicate their presence by the stickiness they impart to the indumentum, and they are easily described by dissection. Perhaps this hiding of them under the hairs accounts for the omission of mention of the glands in descriptions, for instance, by Clarke in the FLORA OF BRITISH INDIA. But in cases the number of hairs is fewer and then the glands are exposed and the ovarian surface glistens with secretion. Moreover the glands extend from the ovary over the lower part of the style. If you find a member of the Falconeri Series with a glandular ovary you may assume that it is R. FALCONERI or one of its microforms (including in that designation R. EXIMIUM). It will be gathered from what I have said that there are many variations in flower-character which require analysis and correlation with vegetative differences before we know the limits that mark off R. FALCONERI as a species.

RHODODENDRON FICTOLACTEUM, *Balf. f.*

[Figured as R. LACTEUM in Bot. Mag. (1911) t. 8372].

[*syn.* R. LACTEUM var. MACROPHYLLUM, Franch.].

The story of R. FICTOLACTEUM will be found in the GARDENERS' CHRONICLE for 1916, and in the TRANSACTIONS OF THE BOTANICAL SOCIETY OF EDINBURGH of the same year. Here it is only necessary to say that the plant is the R. LACTEUM var. MACROPHYLLUM of Franchet, and was discovered in 1886 by Delavay, near Langkiung, not far N.E. from Talifu, in Western Yunnan, at an elevation of 3,200 m. The plant is in cultivation from seeds sent by Delavay to the Jardin des Plantes, Paris, and flowered for the first time in Europe in 1910 with Mr. Godman at South Lodge, Horsham. It seems to be hardy. In the earlier years of its cultivation it was called R. LACTEUM which belongs to a different series of the genus having a velvety underleaf indumentum of one stratum. R. FICTOLACTEUM is a typical member of the Falconeri Series. As we know it, it has the most extended distribution of all the Chinese members of the Falconeri Series, and has been collected in abundance by Forrest on all his journeys, but curiously enough only three sets of his specimens have flowers. Delavay's

station at Langkiung, where Forrest has also collected it is its southern limit; thence it spreads north and north-east over the Likiang Range to the Chungtien Plateau, and also to the Mu-li Mountains in S.W. Szechwan, but it also has a remarkable range to the north-west over the Kari Pass and the Mekong-Yangtze divide into the Mekong-Salween divide. Our knowledge of all this further distribution we owe to Forrest. The specimens of it obtained over its wide area show some variation in dimensions of the rugulose leaf, narrow and broad, short and long, but so far as evidence in foliage-specimens offers only one species is decipherable showing these forms. The strong diagnostic character of the species which all these forms possess is that of the underleaf indumentum. The hairs of the upper stratum which give the cinnamon-colour to the surface are somewhat broad open funnel-shaped cups with a polygonal outline raised on longish many-celled stalks. The cup-wall is thin, of large nearly isodiametric cells, and its undulate margin is lobed, each lobe prolonged into branched hairs, whilst the intervals between the lobes are somewhat concave. The features are most characteristic and enable one to recognise the species without difficulty. It is upon this character that the specimens without flower or fruit have been identified. The flower-truss has some 20 flowers, each flower with a white 8-lobed corolla slightly cream-tinted and with a large basal crimson blotch surmounted by fainter crimson spots, 16 stamens with puberulous filaments, and an 8-10-chambered ovary coated outside with a tomentum of short-stalked hairs not densely aggregated, each putting out from the summit of the stalk many loose branches, the whole hair somewhat resembling a pollard willow. Of where to place this species in the Falconeri Series I am uncertain. It has links with several, and yet differs from all. Perhaps the species least divergent is R. SINOFALCONERI.

RHODODENDRON GALACTINUM, *Balf. f.*

[*syn.* R. LACTEUM, Rehder et Wilson, Pl. Wilsonianæ I (1913) 545 in part].

In 1916, when writing in the TRANSACTIONS OF THE BOTANICAL SOCIETY OF EDINBURGH, about R. LACTEUM and R. FICTOLACTEUM, I pointed out that Wilson's No. 4254, which was placed—with a suggestion of doubt—by Rehder and Wilson, under R. LACTEUM, Franch., in PLANTÆ WILSONIANÆ, could not be that species. The plant was collected by Wilson in October, 1910, at an elevation of 3,000-3,300 m., in woods of Pan-lan-shan, west of Kuan Hsien, in Western Szechwan. Wilson obtained his plant in fruit only, and many plants have been raised from seed collected by him. My expectation that Wilson's plant would prove to be a new species was based upon the examination of the underleaf indumentum of young living plants. As the plants have grown the leaf-characters support the view that we have here a distinct species. Indeed, so evident is the difference in appearance of Wilson's plants and other members of the Falconeri Series that there is no doubt in my mind over the question of specific distinction. Christening of it here is a transgression of a canon which discourages the botanical naming of plants known in foliage only, and if I sin it is because the name affords the simplest method of replying to enquiries as to the identity of Wilson No. 4254, and also of stifling at the outset the naming of it as "R. LACTEUM?" and "R. FICTOLACTUEM?" a practice which is certain

to lead to confusion. Where the plant is growing in the United Kingdom in favourable climatic conditions it must be approaching now flowering age, and until it flowers a full description of it cannot be given. Here, therefore, it is only possible to say that the plant is characterised by a bright-green foliage with a buff-coloured underleaf indumentum. The terminal buds on our specimens are not quite of the type of those of other members of the series, the outer scale-leaves are not prominent, and there is a clustering of buds around the terminal one in a fashion I have not seen elsewhere in the series. Whether this is only a juvenile character time will show. The cup-hairs of the upper stratum of indumentum are most typically those of the Falconeri Series. They are, however, like those of no other species, and furnish a sure mark for recognition and diagnosis. Delicate funnel-cups they are into the base of which the long thin stalk gradually expands. The wall is composed of narrow, much elongated cells, between which are narrow fine ridges of thicker-walled cells which run out from the mouth of the cup as delicate hair-branches, which by interlacing give the soft somewhat woolly surface to the underleaf.

RHODODENDRON HODGSONI, *Hook. f.*

[Figured in Rhod. Sikkim Himal. (1849) t. XV.; Revue Hortic. (1853) t. 22; Bot. Mag. (1866) t. 5552].

This familiar species is said to have been first collected by Griffith, in 1837-38, in Bhutan. If this be based upon the identification by Clarke in FLORA OF BRITISH INDIA, III. (1882), 465, of the plant collected by Griffith at Tsamsu, and figured in plate DXXI. of Griffith's ICONES, the statement is incorrect, because Griffith's plant is not R. HODGSONI, nor a member of the Falconeri Series, but belongs to the Grande Series. Our real knowledge of R. HODGSONI dates from Hooker's discovery of it in Sikkim, in 1848, where it is the characteristic tree or shrub at 10-12,000 feet elevation in all valleys. It was introduced to cultivation by Hooker, and in our gardens it is the hardiest of the hardy. Its large elongated oblong blunt leaves, retaining for long on the upper surface greyish traces of a juvenile indumentum, and showing a grey or later pale buff-coloured under surface are definite features of the true species. The cup-hairs of the underleaf indumentum are shallow, broad and open, slightly funnel-shaped at the joining of cup with the relatively thin many-celled stalk, the wall of the cup formed of large nearly isodiametric cells, and the margin undulate with a few lobular projections which end each in a short fringe hair-branch. They resemble most the cup-hairs of R. CORIACEUM and R. REX, and as in these species give the older leaf-surface a very evident foveolate or scurfy appearance and scintillate prismatic colours from the dry white membranous walls, very different from the woolly look impressed upon the underleaf surface in such species as R. ARIZELUM, R. EXIMIUM, and R. FALCONERI, by the interlacing of the hair-branches of the cup-margin. They sometimes become agglutinate as isolated warts over the exposed pellicle of the under stratum of indumentum, often they disappear altogether from this pellicle. The compact truss of flowers, opening darker and fading to a paler magenta-purple, the not large 6-10-lobed corolla with usually a few dark basal antipetaline small blotches, the very short 15 or more stamens

with glabrous filaments and the 9-12-chambered ovary coated with a tomentum of short-stemmed fasciate hairs with much interlocking branches, the curved capsule some 4 cm. long and barely 1 cm. in diameter of the narrower type in the series like that of R. CORIACEUM, are an assemblage of sharply differentiating characters which prevent confusion of this with any other species. R. HODGSONI finds its nearest allies in the Chinese R. CORIACEUM and R. REX, and in R. REGALE.

In cultivation there are under the name many forms undoubtedly nearer to R. HODGSONI than to any other species but which are not typical of it. They want investigation. To what extent some of them are artificial hybrids, I do not know, but they cannot all be of this origin. We have at Edinburgh several of them which came out of the same packet of Calcutta seed. It may be suggested that they are natural hybrids. Perhaps, but only investigation will decide. We may recall here Lacaita's remarks about his R. DECIPIENS. Lacaita's reference to another plant bearing flowers "crimson in the bud," growing amongst R. HODGSONI and R. DECIPIENS, is interesting as telling us how easy it must be for variant forms to be imported in one packet of seed. He gives few other characters by which to recognise this particular form, yet I think his plant is in cultivation here. From my present knowledge I am disposed to say that plants in cultivation with underleaf cinnamon-brown tomentum cannot be typical R. HODGSONI. The right tint is indicated in Hooker's drawing. There is a field of interesting study in these plants known as R. HODGSONI. The long period that elapses between sowing and flowering—plants from seed sown over thirty years ago are only now beginning to flower here—is a handicap upon observations on cultivated plants, but if made they would add to the knowledge which it may be hoped will some day be derived from study of the plants in their wild state.

RHODODENDRON MEGAPHYLLUM, *Balf. f. et Forrest.*

Forrest discovered this species in June, 1918, in Rhododendron forest on the Shweli-Salween divide at an elevation of 11,000 feet. It was in full flower, and he describes it as a shrub of 10-30 feet in height, bearing yellow flowers with a faint blush of rose or a crimson tint at base. Seed was obtained later in the same year. In our specimens it is a smaller-leaved plant than others of the series. This is a distinguishing mark from its nearest ally R. BASILICUM. The leaves about 18 cm. long and 12 cm. broad hardly wrinkled above have the characteristic rusty to cinnamon-coloured indumentum persistent on the under surface, the cup-hairs of the upper stratum with a bell-shaped base and walls of isodiametric cells, the cup-margin prolonged into a few minute lobes but not really fringed. The flower-truss is large with some 20 flowers. The corolla, medium-sized, about 4.5 cm. long, is unspotted and has 8 lobes. There are 16 stamens with glabrous filaments and a 10-11-chambered ovary densely covered with long fasciate hairs. The capsule is slightly curved barely 2 cm. long and 5 mm. in diameter.

It resembles R. ARIZELUM and R. BASILICUM more closely than other species in the series, but the cup-hairs of the underleaf indumentum separate them both, and then R. ARIZELUM has puberulous stamens and different ovary hairs whilst

R. BASILICUM has much larger leaves and more chambers in its larger fruit. Another species nearly allied to R. MEGAPHYLLUM may yet have to be described. Forrest discovered it in 1918, on the Shweli-Salween divide, and Farrar also found it in 1919, on the Hpimaw Pass. Like R. MEGAPHYLLUM in form and size of foliage, it has a grey under-leaf with indumentum detersile at an early age. The material so far received does not suffice for precise determination.

RHODODENDRON PREPTUM, *Balf. f. et Forrest.*

Of this species, one of Forrest's most recent finds, Mr. J. C. Williams has only received as yet advance specimens by postal packet. Forrest discovered it in May, 1919, at an elevation of 11,000 feet, in bamboo and mixed scrub on the N'Maikha divide, in N.E. Upper Burma, and he writes of it as a shrub of 6 to 8 feet with flowers probably yellowish-white or pale yellow crimsoned at base, but at the date of collection the flowers were almost gone. The specimens show a plant with small leaves 16 cm. long, 6 cm. broad, narrow for the series, palish green above and not much wrinkled, buff-coloured on the underside. The cup-hairs of the underleaf indumentum resemble somewhat those of R. ARIZELUM, having stout stalks and a funnel-type of cup with walls composed of elongated cells, and ridged by bands of thicker-walled ones which diverge irregularly from the mouth of the cup as much-branched fringe-lobes. From the stalk as well as from the wall-ridges branch-hairs also proceed obscuring slightly the cup-mouth. The interlacing of the hair-branches gives a soft woolly aspect to the leaf-surface. There is no perfect truss of flowers on the specimens, but the individual flowers are small, the 8-lobed corolla only about 3 cm. long; the 16 stamens with puberulous filaments are much shorter than the corolla, and the 12-13-chambered ovary is covered with a dense tomentum of shortly stalked branched hairs each hair resembling in its stem and branches a pollard willow.

The position of R. PREPTUM in the series is not definable at present. Perhaps R. ARIZELUM is the closest ally, but the broad leaves dark rusty coloured below, larger corolla, stamens and style of that species distinguish it.

RHODODENDRON REGALE, *Balf. f. et Ward.*

This species was gathered by Kingdon Ward, in May, 1914, at Htawjaw, in the valley of Naum-Chaung, in N.E. Upper Burma, at an elevation of over 10,000 feet. He describes it as a gnarled tree of 20-30 feet, bearing "flowers rather glutinous, cream-white with dark-purple blotch at base of corolla." The large leaves recall those of R. BASILICUM. They are about 25 cm. or more long, 12 cm. wide, slightly wrinkled above, but their under surface is grey in colour like that of R. CORIACEUM, not cinnamon-brown as in so many of the Falconeri Series. The hairs of the upper stratum of underleaf indumentum are of a delicate consistence, each a funnel-shaped cup typically broad and open, but when closely pressed together forming narrow funnels, the stalk short, the wall of elongated small cells, the margin prolonged as a fringe of short hair-branches. This stratum is not thick, and is usually deciduous. The flower-truss is not large, apparently about 12 flowers. The flower is not of the largest in the

series—some 3-3.5 cm. long, and is nine-lobed, and the stamens, 18, with puberulous filaments are short, about half the length of the corolla. The 10-chambered ovary is tomentose with short besom-like hairs.

The grey indumentum and the character of its hairs, the conspicuously puberulous stamens, the 10-chambered ovary with short besom-shaped hairs, separate this species from R. BASILICUM, which to first observation it resembles. The plant is not in cultivation.

RHODODENDRON REX, *Léveillé.*

This as the name of a Rhododendron will be new probably to most Members of the Society. The species was indicated—one can hardly say described—in his customary fashion by Léveillé, in FEDDE'S REPERTORIUM for 1914, based upon specimens collected in May, 1911, at an elevation of 3,200 m., on Mount Io-chou, in N.E. Yunnan, by Maire, who writes of it as a tree 4-5 m. high, bearing rose-coloured flowers. I should have had difficulty about confirming or otherwise criticising Léveillé's determination but for the munificence of Mr. A. K. Bulley and Major Lionel de Rothschild who purchased Léveillé's Herbarium after his death this year (1919) and generously presented it to the Royal Botanic Garden. Examination of the type in Léveillé's Herbarium enables me to say R. REX is a distinct species, the most easterly of the known members of the Falconeri Series. Its rugolose leaves some 25 cm. long, 8 cm. broad, recall by their colouring and by the grey underleaf indumentum those of R. CORIACEUM, but do not taper so markedly to the base and are broader. It is a close ally of this species. The cup-hairs of the indumentum are more or less bowl-shaped with nearly isodiametric cells in the walls, but the cup-margin is distinctly though shortly fringed. The cups are quite easily seen as separate pits on the leaf-surface as they are in R. CORIACEUM. The flower-truss is large, of over 20 flowers, the eight-lobed corolla is long, nearly 5 cm., and more tubular-campanulate than in R. CORIACEUM, but as there it has a basal blotch and many crimson spots spreading upwards from it, and the 16 stamens which have puberulous filaments are nearly twice as long as those of R. CORIACEUM, and the style is in like case. The ovary in the two species is small and has few (here nine) large chambers separated by thin septa. The hairs on the outside of the ovary are floccose, with a long pluricellular stalk, from top of which many erect pointed branches arise in a close tuft, and whilst of the type of those in R. CORIACEUM are different from them.

These two species, R. CORIACEUM and R. REX, are evidently western and eastern forms of one strain within the Falconeri Series. R. REX is not in cultivation.

RHODODENDRON SINOFALCONERI, *Balf. f.*

[*syn.* R. FALCONERI, Hemsley et Wilson].

This, the second earliest to be discovered—although not recognised and described until long afterwards—of the Chinese species of the Falconeri Series, was found by Henry before 1898, in forests at an elevation of 9,000 feet, on the summit of mountains north of Mengtsz, in S.E. Yunnan. There is no certain

record of it since then. Henry says it is a tree of 20 feet with yellow flowers. Hemsley in the KEW BULLETIN of 1910, p. 107, referred Henry's specimens to R. FALCONERI, a procedure from which Wilson dissented—and it is distinct. Its habitat just within the tropics (although at 9,000 feet) and separated by several high divides from the Himalayas, where the lowest elevation for R. FALCONERI is given as 9,000 feet, is certainly against specific identity of the two plants, and the analysis of characters brings out the difference between them as I have explained in NOTES R.B.G. EDIN., Vol. IX. (1916) p. 272. Confirming what I said there further acquaintance with the Chinese large-leaved Rhododendrons, whether of the Falconeri or Grande Series, shows in every case that no one of them is conspecific with a Himalayan plant. Links between the Chinese and Himalayan will be found doubtless when exploration reveals the treasures of the intervening region. R. SINOFALCONERI is not in cultivation, and its place of origin does not suggest that when it does come it will be hardy. It is a fine species with leaves 27 cm. long, 16 cm. broad, and larger than those of R. FALCONERI, not so wrinkled above nor excavated below, and with a paler cinnamon-coloured, apparently very persistent, underleaf indumentum. The cup-hairs have long stalks and the cup itself is shallow and broad, spreading out into a fringe of long not much branched hairs which interlock to form a spongy surface. Of the size of truss the material does not supply evidence but suffices to show that the 8-lobed corolla is large, the stamens have puberulous filaments—and the 16-17-chambered ovary has no glands on the outside, but possesses a dense tomentum of very closely set fasciate hairs.

Since R. SINOFALCONERI was differentiated from R. FALCONERI more knowledge of the relationships of species in the Falconeri Series has been acquired, and I am not assured that R. SINOFALCONERI really finds its nearest ally in R. FALCONERI. Its affinity is perhaps nearer to R. FICTOLACTEUM. Its non-glaudular ovary is a prominent character of separation of it from R. FALCONERI. Its broader leaves and flower-colour tell it from R. FICTOLACTEUM.

Some of these fourteen species of the Falconeri Series fall into subordinate groups of more nearly allied species within the phylum, others are more isolated. It may help to crystallise our conception of the members of the series if some indication be given of these more intimate relationships. I have therefore arranged the species in the following group-table :—

R. ARIZELUM	R. DECIPIENS	R. BASILICUM
	R. EXIMIUM	R. MEGAPHYLLUM
	R. FALCONERI	
R. FICTOLACTEUM	R. CORIACEUM	R. GALACTINUM
R. SINOFALCONERI	R. HODGSONI	R. PREPTUM
	R. REGALE	
	R. REX	

Ten of these species are in cultivation (including those which are only in the seed or seedling stage at present). Those which are not known in cultivation

are R. DECIPIENS, R. REGALE, R. REX, and R. SINOFALCONERI. In the following tentative key I include all the species :—

KEY TO THE SPECIES.

I. Leaf-shape a variant of oval to oblong-oval to obovate rarely oblanceolate. Underleaf indumentum rust-coloured or cinnamon-tinted of shades. Ovary glandular or not.

1. Indumentum surface more or less woolly from interlacing branches of cup-hairs which are easily separable as more or less erect stiff elongated chalices. Corolla creamy-white or pale-yellow blotched crimson at base or rose-pink.

Ovary glandular. Cup-hairs of indumentum sessile.

Leaf-petiole bearded. Corolla rose-pink. Stamens puberulous. Ovary 16-chambered epilose — EXIMIUM.

Leaf-petiole not bearded.

Corolla rose-purple. Stamens puberulous .. — DECIPIENS.

Corolla creamy-white with or without basal crimson blotching. Stamens 16 puberulous or glabrous. Ovary 16-chambered tomentose .. .. — FALCONERI.

Ovary not glandular. Cup-hairs of indumentum stalked.

Leaf-petiole not bearded. Corolla pale-yellow or creamy-white with basal crimson blotch. Stamens 16 puberulous. Ovary 12-15-chambered .. .. — ARIZELUM.

2. Indumentum surface spongy the concavities of its open spreading soft cup-hairs showing as pits amongst the thin interlacing of marginal hairs. The cup-hairs not readily separating. Corolla creamy-white or yellow blotched and spotted or not.

Ovary not glandular.

Leaf-petiole not bearded.

Lamina broad oval. Corolla yellow. Stamens 16 puberulous. Ovary 16-17-chambered — SINOFALCONERI.

Lamina oblanceolate. Corolla creamy-white with crimson blotch and spots. Stamens 16 puberulous. Ovary 8-10-chambered — FICTOLACTEUM.

3. Indumentum surface spongy the mouths of the funnel-shaped stiffish hairs showing as pits amongst the few marginal hairs of the cup which do not form a copious concealing wool. The cup-hairs can be readily separated. Corolla creamy-white blotched crimson.

Ovary not glandular.

Leaf-petiole not bearded. Corolla yellow blotched.

Lamina obovate.

Leaf about 16 cm. long. Cup-hairs bell-shaped and short slightly fringed. Ovary 10-chambered. Stamens 16 glabrous. Capsule about 2 cm. long .. MEGAPHYLLUM.

Leaf about 25 cm. long. Cup-hairs funnel-shaped long profusely fringed. Ovary 12-15-chambered. Stamens 16 glabrous. Capsule about 4 cm. long .. .. BASILICUM.

II. Leaf-shape a variant of oblong to oblanceolate rarely obovate. Underleaf indumentum grey or pale buff-grey. Ovary not glandular.

4. Indumentum surface grey scintillating its bowl-shaped or open funnel cup-hairs visible isolated membranous easily detachable. Corolla rose spotted.

Leaves oblanceolate. Cup-hairs bowl-shaped fringed or not. Ovary hairs floccose.

Cup-hairs not fringed. Corolla about 3 cm. long. Stamens 14 puberulous. Ovary 7-chambered CORIACEUM.

Cup-hairs fringed. Corolla 4-5 cm. long. Stamens 16 puberulous. Ovary 9-chambered .. REX.

Leaves obovate. Cup-hairs funnel-shaped fringed. Ovary hairs fasciate. Corolla about 3.5 cm. long. Stamens 18 puberulous. Ovary 10-chambered .. .. .. REGALE.

5. Indumentum surface grey to pale-buff scintillating, its open cup-hairs isolated erect or adpressed and becoming somewhat agglutinate as a scurf. Corolla rose-purple unspotted.

Leaves oblong. Cup-hairs open shallow hardly fringed. Ovary hairs woolly. Corolla about 3 cm. long. Stamens about 15 glabrous. Ovary 9-12-chambered .. .. .. HODGSONI.

6. Indumentum surface pale-buff not scintillating somewhat woolly its funnel-shaped delicate cup-hairs deliquescing into many thin interlacing branches are not easily separable. Corolla colour unknown.

Leaves oblong-lanceolate or oblong-oval narrowing to apex .. .. GALACTINUM.

Leaves oblanceolate or oblong-obovate rounded at apex .. .. PREPTUM.

For the differentiation of species the character of underleaf indumentum has been largely used in the preceding pages, and the features of the cup-hairs are not only diagnostic of the series, but also within it. It is difficult to give in a few words a satisfactory description of the hair-forms; sketches or photographs are required to make clear their individual appearances and differences. These have been prepared and will I hope appear in an early number of NOTES FROM THE ROYAL BOTANIC GARDEN, EDINBURGH, with a fuller account of the indumentum and its development.

The story which I have written is manifestly incomplete, and readers may be disappointed, as I am, over omissions where information is particularly desirable. But the time is not yet for the writing of complete stories of the several series of Rhododendron—and this because the old requires revision and the new to be assimilated is so large in amount. We have to learn much about the Himalayan forms. For too long we have been content to rest in the belief that the last word has been said upon them. This is far from being the case. Hooker recognised on the spot many distinct forms which Clarke subsequently combined at the sacrifice of precise diagnosis. These have all to be worked over again in the light of newer knowledge. And then the arrival of new species from Western China, which does not seem likely to abate for some time, is constantly extending our horizon and giving us new clues to relationship. Here I only claim to have brought together in one assemblage a number of forms that seem to be naturally related to one another more closely than they are to other forms. That the Chinese species will be found to vary as much as we know the Himalayan ones do we may expect and definitions based as at present upon single dried specimens will be found doubtless to require modification; but I have confidence in the correctness of my interpretations of characters as phyletic and have hope that some at least of what I have written may be helpful to Rhododendron lovers.

I. BAYLEY BALFOUR.

RHODODENDRONS AT DAWYCK STOBO, TWEED-DALE.

The extraordinarily severe early frost of 15th November last is rather too recent to judge of its full effects on rhododendrons here. The temperature fell for one night to 4° below zero, and only a few miles further north in this County the thermometer actually registered 41 degrees of frost. Temperatures of 2° below zero are almost of annual occurrence with us, but never before have I heard of such a frost so early in the winter.

The Chinese rhododendrons, which have been growing here for some years, are for the most part the result of Wilson's Expeditions for Messrs. Veitch and the Arnold Arboretum, and a great many of them I owe to the generosity of Professor Sargent.

Two years ago I enumerated in a note for the Society (Vol. 1, page 152), most of the rhododendrons here that had succumbed to severe frosts, or had been injured, or had shown no ill effects at all. Of the survivors then I have lost no more, and in spite of the lesson I had already learned, I have attempted again to establish a good many of those that had previously failed. I have also planted many more species which two years ago I did not have.

It may be of some interest to Members to learn which have consistently shown perfect hardihood, and which find this climate too much for them.

I am quite certain that any rhododendron, hardy here, can be grown successfully anywhere in the British Isles, below 1,200 feet altitude. A comparison of the following list with the previous one will show that several which had previously been injured or killed outright are now re-established and apparently quite hardy, and I am agreeably surprised to find how many of the more recently introduced species are equally hardy.

The following plants have been killed by the November frost :—R. CRASSUM, ZALEUCUM, Bailey's ARBOREUM, FORDII, NERIIFLORUM, DELAVAYI, HUNNEWELLIANUM, while the following had their foliage browned, but I expect will quite recover :—R. CYANOCARPUM, WASONII, CALLIMORPHUM, HANCEANUM, FLORIBUNDUM (two plants out of five much injured), Forrest's LACTEUM.

The buds of these next have been frozen but the foliage does not seem to have much suffered :—R. YANTHINUM, PLEBEIUM, HABROTRICHUM, VILLOSUM, FULVUM (one plant badly injured, the other two do not seem to have suffered).

Those that seem to be nowise the worse are :—R. FICTOLACTEUM, GALACTEUM (Wilson's lacteum), NIPHARGUM, WATSONII, FORREST 5870 (Traillianum ?), LONGESQUAMATUM, FABERI, TRICHOCLADUM, ARGYROPHYLLUM, RHANTUM, SOULIEI, INSIGNE, WELDIANUM, DAVIDII (flower buds quite uninjured), OREODOXA (flower buds quite uninjured), RUBIGINOSUM, PRATTII, OLEIFOLIUM, HYPOGLAUCUM (but R. GLAUCUM had its leaves browned), RIREI, PRZEWALSKII, PACHYTRICHUM, STRIGILLOSUM, OREOTREPHES, (flower buds uninjured on the old wood but young shoots have suffered), TALIENSE, WILTONII, TRAILLIANUM, HOULSTONII, DAVIDSONIANUM, WILLIAMSIANUM.

I have some 5 feet plants of the larger-leaved species, R. SUTCHUENENSE, CALOPHYTUM and DISCOLOR, all of which are growing very vigorously and never did better than during the summer of 1919, but none have flowered yet. R. DECORUM gives a good show of blossom every year.

For some unexplained reason I fail completely with all the small leaved heath-like species I have tried, R. SARGENTIANUM, INTRICATUM, FASTIGIATUM, but they all die in their first few months here, and I have made several attempts.

R. RACEMOSUM though quite hardy is disappointingly sparing of flower in most seasons.

Of the Himalayan kinds R. THOMSONII was well covered with flower buds, but, alas, the November frost has destroyed those on some of the plants though the buds of taller plants escaped.

Of Japanese species, few of which will live at Dawyck, R. METTERNICHII has had its last year's growth badly scorched; it seems to ripen its foliage late. The only perfectly satisfactory rhododendron from Japan in any situation here is R. BRACHYCARPUM.

It is rather surprising that Gaultheria procumbens which does well almost universally gradually dies out here, though Gaultheria Shallon of the Pacific Coast is one of our best plants though, if anything, less vigorous than G. Veitchiana of Wilson.

F. R. S. BALFOUR.

PLANTS AND RHODODENDRONS AT KILMACCURRAGH.

I had the pleasure of spending a few hours at Kilmaccurragh this year, and will give as best I can a summary of my notes as a continuation of my contribution to the Rhododendron Society's publication of 1917.

To those unacquainted with the wonders of this charming place, and splendid collection of trees and shrubs, I may say that on entering the demesne no one can have any idea of the surprises that are in store for him.

The first thing that greets the eye of the visitor, after passing down the avenue for some distance, is a group of fine, large, well-grown plants of Rhododendron ARBOREUM hybrids, behind which there are magnificent specimens of Pinus excelsa, Sequoia sempervirens, Picea sitchensis, Cedrus atlantica glauca, and a very distinct and curious form of Cupressus Lawsoniana. This last-named tree, which is upwards of 40 feet high, grows exactly like Libocedrus decurrens, and until one has examined it closely it is impossible to believe that it is anything else but the latter. I know of no other plant like it.

Coming into the park you are struck by Abies Pindrow, which I measured and found to be 52 feet high. This tree was raised from imported seed, and was planted 39 years ago. I never saw a plant better grown or in finer health, the length of the leaves being prodigious. Further on there is a fine tree of Abies Webbiana var. brevifolia, which was raised from imported seed, and planted the same year. I measured it and found it to be 36 feet high. I was moreover much interested in a splendid specimen of the spreading form of Cupressus macrocarpa, which measured 40 feet high and 77 feet wide, close to which is Abies Pinsapo var. glauca 56 feet high, and Picea Alcockiana (now called P. bicolor) 50 feet.

In the avenue amongst the R. ARBOREUM hybrids I omitted to mention a large plant of Cupressus pisifera var. squarrosa, which I found to be 35 feet and 5 feet in girth.

Below the house one finds many Rhododendrons remarkable for size and condition, such as R. FALCONERI; a wonderful specimen of R. ARBOREUM ALBUM, 40 feet high, of the upright form, and with smaller leaves than the type; it was planted in 1864. Near by is a fine R. HODGSONII, close to which stands Prumnoitys elegans, 26 feet high and 20 feet through. This tree was in fruit a few days ago. Again there are nice specimens of R. FULGENS and the newer R. YUNNANENSE (planted 12 years ago), both 12 feet high, close to which is a very interesting plant, Vaccinium glauco-album, *Hook, f.* (Flora Brit. India, Vol. III., p. 353). Further on one sees the rare R. SHEPHERDII, over 12 feet high, and next it is a hybrid, raised by the late Mr. Mangles, between R. CAMPANULATUM and R. THOMSONII. Here one also sees splendid plants of Ilex perado, 24 feet high by 30 feet through; while Ilex Latifolia, 25 feet high, was in fruit a few days ago. Then comes Rhododendron EXIMIUM, 25 feet high and as much through, and opposite Podocarpus nubigena, 30 feet by 30 feet. There are several grand

plants of Rhododendron GRANDE ; one I found to be 25 feet high, and near is a thriving young specimen of Pinus Armandii about the same height. There is, moreover, an interesting hybrid between R. BARBATUM and R. CAMPBELLIÆ which stands close by ; the flowers are deep pink with frilled edges and very fragrant. It was raised by the late Mr. Thomas Acton, the former proprietor and collector of all these treasures, about 45 years ago. Of the many other rhododendrons of interest there are :—R. LANATUM, R. BRACHYCARPUM, R. DECORUM, R. ZEYLANICUM (about eight feet high), a fine hybrid between R. FORTUNEI and R. THOMSONII, and the rare R. RHOMBICUM. I should not forget to mention that Kilmaccurragh possesses not only a large and thriving specimen of Nothofagus Cunninghamii, but also the only plant of N. Moorei that is, I believe, to be found in Europe. This latter somewhat resembles N. procera, except it is evergreen ; it is well-grown and in excellent condition, but, unfortunately, all efforts hitherto made have failed to propagate it. Near by is Magnolia Campbellii, which bears its lovely flowers, and also a huge plant of Senecio Grayi. Of others I may note : Laurelia serrata, a rare evergreen with fragrant leaves from South America ; Embothrium coccineum which grows to tree-like size ; Juniperus recurva, 25 feet high ; Fitzroya patagonica, 35 feet ; Thuya japonica 30 feet, Eucalyptus coccifera, 56 feet, planted in 1899 ; and a fine young specimen of Cupressus cashmeriana, 10 feet high.

HEADFORT.

A FURTHER NOTE ON THE CULTIVATION OF RHODODENDRONS AT LEONARDSLEE.

The soil at Leonardslee, generally speaking, is not unfavourable to the growth of Rhododendrons, but there are parts where the soil is too heavy and where they suffer in cold, wet winters, and there are some parts where the soil is so light that it dries up completely in times of drought.

I have already mentioned in Vol. I., p. 195 of the Society's Notes, that we had opened a trench round the plants that had suffered, and had placed turfy loam round the roots. The turf is taken off, about one inch thick, off pasture land and stacked. This note is to say that this treatment has succeeded beyond expectation.

All the plants so treated, which were looking ill and yellow, are now in the best of health, with dark green foliage. We find that leaf mould, and peat even, are apt to turn sour, and we now pin our faith to turfy loam when anything is required.

EDMUND GILES LODER.

The Rhododendron Society Notes.

RHODODENDRONS AT LOGAN.

I think it may be of some interest to record the behaviour of R. ARBOREUM planted in very wet ground. Many years ago I planted some R. ARBOREUM seedlings of some years growth in ground of this nature. The place was so wet that only a shallow hole could be dug owing to the water which at once filled it up, and as there was no room to get in the plants, a bed of peat had to be laid on the top and raised 18 inches to enable the plants to be placed where they were wanted. These ARBOREUMS are now large plants and flower splendidly every year though they are often sitting in water. Peat is laid over the roots from time to time; this form of mulching seems to be all that is necessary to their well-being. Near by, also in a wet place, are some plants of R. "PINK PEARL" treated in the same way, and these have flourished splendidly, producing each year enormous blooms. I measured these last year and found most of them as follows: truss 10 inches high, 24 inches in circumference, flowers, 17 inches, each flower 4½ inches across.

These plants make very strong growth and are somewhat straggly in habit. I have other ground of a swampy nature at the foot of the hill where I grow most of the Rhododendrons, and here in places where the ground is sufficiently firm to support the plants, I hope in time to try Rhododendrons. Neither rabbits nor roe deer have done any serious injury to any of the Rhododendrons since my last report. Moles, however, owing to the lack of labour to trap them, have taken possession of the ground and injured some of the small plants by working round and under the roots, and thereby loosening the hold of the plants. Weevils disfigured many leaves and some were eaten by caterpillars.

R. LUTESCENS during a mild spell of weather in February last was decidedly nice, covered with its yellow flowers, deeper in colour than R. TRIFLORUM. R. HOOKERI has flower buds again this year; it did not flower last spring. R. AUCKLANDII flowered well for the first time here last year.

Gradually the Rhododendron ground is becoming better sheltered, but there is much to be achieved yet in this respect. Young larches cut with their branches left on and placed upright with strong supports and with their butts sunk into the ground are of great use while the shelter belts are growing. Used also for permanent shelter in a few places where nothing will grow, such as between old tree trunks, they give capital results as wind stops, and can easily be taken away in summer if necessary, but I do not think they will be much in evidence at any time of the year, and having once placed such screens in the right places, I hope it will be possible to let them alone for they should last for many years.

KENNETH McDOUALL.

NOTES FROM LAMELLEN GARDEN, 1919.

The seed-capsules of several species of rhododendrons have peculiarities which are interesting, and have doubtless been noted by the botanist, though they may not have attracted the attention of the ordinary gardens. Those of R. SCHLIPPENBACHII, for instance, are very thick and woody, whilst the seeds are large and comparatively few in number. They germinate well, however, and during the first season outstrip in growth any with which I am acquainted; but the difficulty with them comes later, and I have found many of the small plants die off for no apparent reason. I am inclined to think that the species is very susceptible to drought, at any rate until three or four years old.

R. CAMELLIAEFLORUM makes plenty of large seed pods, which however contain a lot of chaff and comparatively few good seeds. The capsules of CILIICALYX are remarkably thick and woody, and there is not much seed, but this may have been accounted for in the pod under examination by the fact that it had been fertilised with MOUPINENSE pollen.

January 5th. To-day I found three beautiful flowers on a plant of R. ZEYLANICUM. It is curious, despite the resemblance in leaf, that this species has for so long been confused with R. KINGIANUM, for that plant flowers some months later, and has a much smaller truss of more tubular flowers, of a much darker and richer shade of crimson.

Second week in March. A flower opened on a plant which came under the number 1872, Wilson, and should therefore be R. WATSONII, but is not. It is a shrub with an erect habit, and there are nine flowers to the truss, 2¼ by 2½ inches, seven-lobed, very pale rose with two small faint lines of red spots in the interior; filaments and stigma white, stamens dark brown. A first flower, and not a good one, which got partially destroyed by frost, when it was half out. The plant looks as if it may prove to be one of the OREODOXA series.

Second week in April. R. PACHYPODUM (13512F), clear butter-yellow, without the green tinge which there is in BOOTHII, five in a loose truss, 2 inch by 1½ inch, five lobed, stamens brown, stigma yellow; the exterior covered with brown glands. The plant is hardy, but I hear the flowers are susceptible to frost. This species has the curved style peculiar to BOOTHII, TRICHOCLADUM, GLAUCUM, etc.

Also R. SCABRIFOLIUM (11072F), four in a truss, ¾ by ⅝ inch, white, tinged pink, five lobed, stamens white, tinged brown, stigma white. The flower is not very attractive, and the plant is not supposed to be too hardy, but the leaves are very distinct and at once attract attention.

Fourth week in April. A pot plant of R. "LEPIDOBOOTHII" flowered in a cold frame, soon to be followed by others out of doors. Five-ten in a loose truss, 1½ by 1 inch, openly campanulate, yellowish-white, tinged with pink and green, especially on the outside, interior spotted with greenish-brown, stamens 10, light-brown, filaments pink, stigma green. To my mind a pleasing little flower,

contrasting well with the brown leaves of the young shoots derived from BOOTHII. A straggling flat-growing plant of unknown origin, though raised from seed here, and which Prof. Bayley Balfour says is R. OLEIFOLIUM, *Fr.*, but which differs from Forrest's OLEIFOLIUM in having pure white flowers and a much less erect habit, and also in flowering some weeks earlier. The authorities at Kew say that Forrest's plant is Franchet's OLEIFOLIUM, but I can hardly believe that these two are one and the same species. The flowers were pure white, single in the axils of the leaves, campanulate, unspotted, five lobed, 1½ by 1⅝ inch, filaments white, stamens bright brown, stigma yellowish-white.

1539W, a species yet unnamed, six flowers in a loose truss, pale violet-rose with a dense spotting of crimson, and a blotch of crimson at the base, five lobed, campanulate, 1½ by 1½ inch, filaments blush-white, stamens pale-brown, stigma yellowish-white.

Another plant of Wilson's of which the number is lost, but which may be a variety or natural hybrid of STRIGILLOSUM, seven in a loose truss, pale violet-rose, campanulate, unspotted, but with a blotch of crimson at the base, 2 by 1$\frac{7}{10}$ inch, filaments white, stamens dark-brown, stigma yellowish-white, five lobed.

R. 7794W MACROSEPALUM, violet-rose, four in a loose truss, calyx green divided to the base, and almost as long as the corolla, four lobed and deeply cleft, spotted on two segments with crimson, filaments same colour as corolla, stamens four in number, pale-brown, stigma yellowish-white with pink apex, openly campanulate.

R. " KEISKARBOR " (Keiskei×pink arboreum), white, shaded old-rose, with a blotch of crimson at the base, and two short lines of crimson spots, narrowly campanulate, 1$\frac{1}{10}$ by $\frac{7}{10}$ inch, 10 in a trnss, stamens bright-brown, stigma and filaments white.

One of a batch of rogues which came among seed marked R. TALIENSE—Tali Range 12,000 feet. I believe these to be a natural cross between HAEMATODES and NERIIFLORUM, as the leaves in about a dozen plants show every gradation of tomentum, and colouring from one species to the other. Ten in a truss, blood-red, unspotted, 1¼ by 1⅜ inch, waxy, rather narrowly campanulate, filaments and stigma paler than corolla, stamens dark-brown, five lobed. Compared with NERIIFLORUM the flower is rather larger, of more substance and more fleshy, rather longer in the tube, not so deeply cleft into segments, and the colour is even more brilliant.

Third week in May. R. INDICUM MACROSTEMON (7862W), solitary flowers on a dwarf compact plant, lilac-rose with red spots on the upper segments, 1$\frac{7}{10}$ by 2⅜ inch, five lobed, openly campanulate, filaments and pistil red, stamens light brown. This plant has set large pods of seed to the blue AUGUSTINII (4238W).

Second week in May. R. MOLLICORNUM (10347F), flowers in two's in the axils of the leaves, pale-rose, five-lobed, 1 by 1 inch, filaments and pistil same colour as corolla, stamens purplish-brown, tubular campanulate.

Fourth week in May. R. STEREOPHYLLUM (11299F), pure white with orange spotting on upper segments, four in a truss, five-lobed, $\frac{9}{10}$ by 1⅛ inch,

campanulate, filaments and pistil white, stamens pinkish-brown. This is almost deciduous, and appears to be one of the chartophyllum section.

Last week in May. A rhododendron flowered of which Forrest's description is " Rhod. sp ? Tali range. 6-10 feet. Flowers ? Open thickets, 11,000 feet." And the flower is as follows :—Lemon-yellow (Repertoire de couleurs)—which means that it is as yellow as BOOTHII but brighter, 3-5 in a truss, $\frac{7}{10}$ by $\frac{9}{10}$ inch, five or six-lobed, unspotted campanulate, filaments the same colour as corolla, stamens rather darker, stigma yellowish-green. Prof. Bayley Balfour believes this to be R. AUREUM *Franchet.*

Third week in September. R. REPENS (13259F), a near relation of R. FORRESTII. It is an absolutely prostrate plant and climbs like ivy, with a single scarlet-crimson flower 3.8 cm. long, tubular campanulate. I have put its pollen on to ADENOGYNUM and FLAVIDUM, but fear it may be too late in the season for them to ripen seed.

Also HIPPOPHAEOIDES × FASTIGIATUM—sown February, 1918, produced its first flower. The plant has the habit of FASTIGIATUM, but the flowers are the palest possible lavender, almost white, and a group of the plants should look very pretty.

The hot summer followed by rain has brought a good many species into flower, and at the time of writing (September 21st), there are blooms on ADENOGYNUM, FASTIGIATUM, RUPICOLUM, FLAVIDUM, and a white hybrid from this, PARVIFOLIUM, " PROSTIGIATUM,*" REPENS, HIPPOPHAEOIDES, PONTICUM, CEPHALANTHUM, CEPHALANTHOIDES, KEYSII, ANTHOPOGON, and HIPPOPHAEOIDES × FASTIGIATUM.

Amongst this year's seedlings, caterpillars have been very troublesome, at first a lot of small green ones, and now many tiny dark olive-green, which feed under the leaves, and when they drop are almost indistinguishable from the soil, and are thus difficult to catch. Some seedlings, which were not numerous, they have entirely destroyed.

E. J. P. MAGOR.

September 21st, 1919.

* Prostratum × fastigiatum, a most beautiful hybrid raised by Mr. Magor.—C. C. E.

MONREITH, WIGTOWNSHIRE.

The season 1919 has been exceptionally favourable for early flowering and early growing rhododendrons. The winter was very wet and mild till towards the end of January, when a cold spell came on with a minimum temperature of 15° Fahr. The weather throughout March was very cold, checking growth on the plants which were ready to start vigorously when the temperature rose in April, and there was a complete absence of late spring frost, owing to the prevalence of cloud.

Rhododendron BARBATUM, ARBOREUM, THOMSONII, SHILSONII, CAMPYLOCARPUM, etc., made a splendid display. R. DECORUM, *Franchet*, was loaded with bloom, and many plants of R. DECORUM, *Wilson*, flowered freely. I was absent on the Continent throughout May; when I returned I found two plants of R. EDGWORTHII, trained six feet high, one on a north wall, the other on an east wall, covered with their fragrant blossoms. These had received no protection save that afforded by the walls.

In 1917 I received some plants of R. SINOGRANDE from Mr. J. C. Williams, which I planted out without protection. The spring frosts of 1918 destroyed the leading buds, but vigorous secondary growth was made, and they passed through the winter of 1918-19 without the slightest injury. This species seems to be of similar hardihood to R. GRANDE, *Wight*; that is, both, if well sheltered from wind, can resist any degree of winter cold that they are likely to encounter on the west coast; but, starting early in growth, they are apt to have their buds destroyed by spring frost.

R. MAXIMUM, 10 feet high, being in a position exposed to the north, suffered severely from the violent north winds that prevailed throughout March and part of April. Some of its branches were killed outright, but it flowered freely in late June on the lee-side.

We have only one plant of R. FULGENS here, and, having tried in vain to obtain others from various nurserymen, I shall be grateful for information as to where it can be found.

R. GLAUCUM promised a great display; but the extreme drought that prevailed throughout March and April interfered, causing most of the flowers to fail to open.

HERBERT MAXWELL.

RHODODENDRONS AT ROWALLANE, CO. DOWN.

A few unpretentious notes on certain species of Rhododendrons growing here may prove of interest, though neither in the species referred to nor in my observations on their characteristics will there possibly be much that is new to members of the Rhododendron Society generally.

Amongst species of comparatively recent introduction that have so far flowered here, a front-rank position must be assigned to R. NERIIFLORUM. Apart even from the scarlet brilliancy of the flowers, its good compact habit and apparent hardiness, the plant possesses the further conspicuous merit of starting comparatively late into growth, and thus escaping the worst turns of spring frost. Moreover, it appears to develop flower-buds freely. Specimens here have been placed in various positions, ranging from full south to due north, with typical Rhododendron treatment as to soil, and it would appear that the healthiest plants are those which are sheltered from the mid-day sun, and generally enjoy a cool root-run.

R. HABROTRICHUM itself has not as yet flowered here, but amongst seedlings raised from imported seed of this species we find a few plants which would appear to be natural hybrids between it and R. NERIIFLORUM. The leaf is smoother, smaller, and more glaucous on the underside than in typical R. HABROTRICHUM, the hybrid in fact partaking more of R. NERIIFLORUM than of R. HABROTRICHUM, though yet amply distinct from the former species. This characteristic is further exemplified in the fact that the seedlings bearing most affinity to R. NERIIFLORUM are well set with flower-bud, whereas those of true R. HABROTRICHUM show no sign of flower. The bud of the hybrid is globular in form and of a dull-red colour, in contrast to the greenish-yellow of R. NERIIFLORUM. This matter of hybridity as between R. HABROTRICHUM and R. NERIIFLORUM in the one case, and between R. CALLIMORPHUM and R. NERIIFLORUM in the other, has been lucidly and conclusively dealt with by Prof. Bayley Balfour, in the January issue of Notes from the Royal Botanic Gardens, Edinburgh. There would at all events appear to be a recurrence here of characteristics which have been observed elsewhere.

The typical R. CALLIMORPHUM is growing happily here under conditions very similar to those afforded to R. NERIIFLORUM. This is undoubtedly a plant of peculiar charm from the early stages of the opening flower-bud of brilliant cherry-red to the fully expanded bell of salmon-pink, and faintly tinged with lilac, boldly blotched with crimson. Sturdy specimens on the north side of a big rock are developing into beautiful little bushes, symmetrical and compact, and following a fine display last May there is to-day promise of even better things next spring.

In R. HANCEANUM we appear to have a plant that represents a stumbling block to many a gardener, and bears in consequence a somewhat evil reputation. Here it clearly demonstrates its dislike of low-lying sunny positions, and appreciation of a sloping, well-drained bank where little or no sun can reach it, and

where its roots penetrate cool ground beneath a neighbouring stone. In such a position the somewhat pendulous growth and extreme freedom of flower is well displayed, and the plant generally receives the admiration which it rightly deserves. From seed of this species there has been raised here a pigmy sport—just a dark-green cushion bursting with creamy-yellow flowers, a mossy Saxifrage on a grand scale. One little mat, nine years of age, though perhaps one foot across, is still beneath two inches in stature, and when covered in bloom represents as pretty a picture as one could hope to find in any rock garden. R. BAILEYI, hailing the Brahmaputra River at the Thibet-Burmese bend, introduced by and named after its discoverer, Colonel Bailey, is rapidly developing into a stout, bushy shrub of good habit and undoubted hardiness. The conspicuous racemose truss of red-purple, saucer-shaped flowers are prettily borne in early May, and again, though less plentifully, in mid-October. The plants are profuse bloomers, and the litter of fallen petals that cover the ground around them tends but to prolong the effect of an attractive floral display. From a batch of R. BAILEYI seedlings some interesting diminutive forms have originated, characteristic of R. LEPIDOTUM, though possibly entitled to specific rank.

R. ZALEUCUM makes an attractive shapely bush, the neat foliage strikingly white on the underside, and the young growth almost rivalling Pieris japonica in beauty of tint. The flower, varying from pure white to pale shades of lilac, though sparsely borne till the plant is well established, is of decided delicacy and refinement. Culturally this species is easily satisfied, and seems equally happy in sun or shade. Where a neat, trim hedge of moderate dimensions is required, R. ZALEUCUM might well be given a trial. R. LEPTOTHRIUM, though eight years old from seed, has not as yet flowered here, and in the ordinary run of positions make singularly slow growth. A few plants, however, in a choice spot under the shelter of a high rock, where no glimpse of sun can reach the soil, look particularly promising, making clean, healthy growth each year with rich bronze-green foliage. This is a plant which appears to need care, and will doubtless well repay those who wait patiently for its "deep rose flowers with crimson markings." The free growth and good upright habit of the true R. DAVIDSONIANUM have here rapidly resulted in telling six feet specimens, which in May are literally covered with flowers, whose colour may be given as an attractive blending of pink and mauve. This is a well-disposed plant in almost any position, but is perhaps seen to best advantage in open ground and full sun. Likewise R. CHARIANTHUM, less upright and more spreading in habit, with blooms of lilac shading, rivalling in beauty of form and colour some of the best varieties of R. AUGUSTINII.

A bed of R. OREOTREPHES bears each spring a perfect multitude of flowers in shades of mauve, the prettily tinted leaves at such a time being scarcely discernible, though later asserting themselves as by no means the least attractive feature of a really good plant. The freedom with which this species bears seed is quite remarkable.

R. FORTUNEI CYANOCARPUM has not as yet flowered here, but as foliage plants many strong eight-year-old seedlings are distinctly noteworthy, individual leaves in some cases measuring nine inches by four. When young, the plants are

liable to be heavily cut by frost, but a vigorous constitution assists towards rapid recovery, and under such conditions individual plants have responded with as much as three feet of growth in a single season.

R. FULVUM has also shown no bloom here as yet, but it stands out as a handsome hardy plant with an exceptional richness of colouring on the underside of the leaf.

Such large-leaved, vigorous-growing species as R. DECORUM, DISCOLOR, FICTOLACTEUM, SUTCHUENENSE, and CALOPHYTUM enjoy and richly deserve a somewhat stronger diet than those of lighter growth, and when once established repay in vigour of wood and colour of leaf for a liberal mulching of well-rotted farm-yard manure.

The limits of space forbid reference to more than a restricted selection of the species growing here, and these notes will therefore conclude with a few remarks on the all-important matter of general cultivation. The natural soil here consists of a variable loam on a gravelly subsoil, with extensive outcrops of whinstone rock. Gorse is an exceptionally vigorous local weed, and here and there natural deposits of peat are to be found. The ground is mostly undulating in character and adequately furnished with timber of between 50 and 60 years growth. No special advantages are enjoyed by reason of proximity to the sea, or by an especially well-sheltered position generally. In the selection of sites for planting the main consideration centres round protection from harsh winds and good drainage, in ground free from overhead shade or drip, but where the full strength of summer sun is tempered by surrounding tree growth. The natural soil is but little relied upon except as a groundwork, and recourse is had to made-up material, composed of friable loam and peat in equal proportions, with one-part pure sand and two-parts decayed leaf-mould, incorporated. The surface after planting is mulched with three inches of dead leaves or light litter, a fair proportion of well-decayed farm-yard manure being added as soon as the more vigorous growing species have become established. In our climate there is little fear of dryness at the root, but an occasional soaking with clean water when roots are active is highly beneficial. A periodical thinning out of weak wood and the removal of decayed flowers amply repay careful attention. Under such conditions of culture the general run of Rhododendrons will flourish exceedingly. It is infinitely to the credit of the genus that so many of its members provide such rich adornment to our gardens with but little of the cultural attention here recommended.

H. ARMYTAGE MOORE.

GROWING LARGE-LEAVED RHODODENDRONS.

Many gardeners find a difficulty in growing some of the large-leaved species, such as R. GRANDE or its hybrid R. "ELSAE." I have found that it pays to grow small layers or seedlings of these large-leaved species partly under glass for two years. The layers are often but scantily rooted, and the plant has a hard struggle its first winter, and dies in its second one.

My plan is to put the layer or seedlings into a wooden box with plenty of leaf-mould in the soil, and then plunge the box in the border of an early peach house. If the house is heated so much the better, but nowadays coke is too valuable to waste on early peaches. But in any case the house will be shut up and the trees started early in January. The rhododendron, of course, starts its growth, and keeps growing without a check of any sort. By May the growth is completed, and then the box should be lifted and plunged again out of doors in a shady place; under a north or west wall is an excellent site. By the middle or end of October the plant should be again plunged in the peach house, and left there till the following May. It can then be moved again, box and all, to its summer quarters and finally planted out in the garden in the autumn.

The advantages of this method are well worth the trouble taken to obtain them. The plant has had two seasons growth without any check from frost or drought. It may quite well make from two to three feet of good growth in the two seasons, and if the soil was suited to rhododendrons the box will be full of excellent roots. It is a great pull to have a well-grown and well-rooted plant to put out, as such a plant will stand a hard winter, or any other adverse condition, much better than a stunted or badly-rooted specimen.

My plan has also the great advantage of giving the plant plenty of time to ripen its wood, and really ripe wood will stand a very hard winter without flinching. I do not suggest that all this trouble is required in Cornwall or other favoured parts of Great Britain and Ireland, but here in Sussex, 440 feet above sea level, it pays over and over again.

I am now growing a fine young seedling of R. SINOGRANDE on this plan, and I hope by October, 1921, to have a real big plant to put out in the garden. If this species is just on the border line of true hardiness, I feel sure my method will give me the best chance to get it established.

CHARLES G. A. NIX.

SOME NOTES ON THE RAISING OF RHODODENDRON SEEDLINGS.

It may be agreed that certain species and hybrids of this family are easy to raise a few of, if you sow a lot of seed, although in the first two years of life even these will die if subject to prolonged drought or to over-watering.

We have all seen certain gardens where the self-sown seeds of Azaleas and Rhododendrons come up in the open freely, but in the average garden these places are less common, and if noticed with care will be seen to show in the most positive way what the young plants need and what they most resent. Broadly speaking, they enjoy shade from the full sun, and an even measure of moisture all through the growing season, with no weeds to smother them.

Mr. White, of Sunningdale, is perhaps the only man in this country who has taken the teaching of nature, and so improved on it, that he has been able to raise scores of rare species of Rhododendrons of all sorts and sizes in the open with no glass to help him, but I think in most cases he has been able to sow the seed in good quantity. Anyone interested in this matter would learn much by seeing what he does, and above all by hearing why he does it. The objection to his plan is that, at any rate in some instances, it takes quite five years to reach the point three-year-olds can be brought to if started under glass, and two years of gardening life is a lot to give away.

I should not like to say positively which is the best way of sowing seed, but after many years of raising seedlings we now use wooden pans only. They are 8 inches by 8 inches, and 4 inches deep, with the wood in the bottom section made of three pieces about one-sixth of an inch apart for drainage.

In the case of species from abroad, it is not always possible to know what sort of rhododendron is in the packet, and so we have a sort of standard mixture for the soil in the pans, consisting of one-third silica sand, one-third hedge earth, and one-third fine leaf soil. If we know the seed to be of the very small high mountain species, we greatly increase the silica sand. The soil in the pan has plenty of drainage to keep the openings in the bottom of the pan clear, and is well steamed in the pan before sowing. The seed is sown on the surface of the pan, and after sowing the pan is covered with a sheet of glass of the same size as the pan.

Germination takes place in good seed about the twenty-first day. As the plants develop, a little air is given by raising one edge of the glass, and that is increased as they grow, but as far as may be an attempt is made to keep them cool and moist without much overhead watering, but some judgment and much careful watching is needed in doing that effectively.

Perhaps the temperature and air moisture of an Odontoglossum house is the ideal place for starting Rhododendrons in from April to June, but after that the air should not be so moist, or the plants will be too soft to battle with the greatest risk in their lives, that is the danger of damping off between August and May.

When the summer nears its end the surface of the pans should receive less and less moisture, so that when the autumn comes the roots will have gone down further into the soil, and then the plants should only receive water from below.

I prefer eight-inch wooden pans all of the same size, then it is easy to know if a pan is in need of water by its weight, at any rate after a little experience, for the eye is nearly useless for this purpose.

With a view to obtaining a nearly dry surface to the pan after August or September, they should only be watered (and that only at long intervals), by partial immersion for a short time in a larger pan with water in it, care being taken to prevent the water reaching the surface of the seed pan. This, I think, with a clean and fairly dry house, is the best medicine to meet the great danger of damping off.

As regards pricking off, it is best to start doing it as soon as the seedlings are large enough to handle, so as to leave a good air space around the plants left in the stock pan, and to enable the transplanted seedlings to have more room in the new pan to develop.

The newly transplanted seedlings should have the shelter of the glass on the pan for a few days, air being admitted as seems best, after they have settled in the new pan. When these seedlings, whether in the stock pan or in the transplanted pans, begin to show fair sized plants, they should be moved on again to a bed in a frame. The frame may face south if it is really well shaded, and great care must be taken to prevent it becoming too dry or too wet.

When the plants there have made a good growth, they should be moved into a nursery.

I have found that if you try and break a stock of a species up, and work it in several lots, with rather different treatment for each lot, you will be able later to get very much more advanced plants from some lots than from others, and so to gain time and development.

It is worth notice that even if you have had a fairly long experience at this work, there is no certainty as to how you can best get a given species to develop quickly, though if the best plants of a batch are watched closely, and also the worst plants, the causes of the contrast can often be arrived at.

The essence of the whole business is first to raise plants, and then to develop them as rapidly as may be, and it all requires very close attention for success.

J. C. WILLIAMS.

August, 1919.

NOTES ON CHINESE RHODODENDRONS AS GROWN IN CORNWALL.

I propose to again give my present impressions on the garden value of some of the species of Chinese rhododendrons lately introduced, but must repeat that these impressions are in many cases the result of a very limited experience of the plants.

R. BULLATUM seems to be of a rather more compact habit and to have larger flowers than its kinsman, R. EDGWORTHII, and as a garden plant it seems to be rather hardier. It much resents excessive moisture at the root. It shoots freely if cut back hard at the right season.

R. CALLIMORPHUM, apparently a dwarf and compact bush with truss of small campanulate bells which are a pleasant shade of pink. It appears to be easy of cultivation. To me this is a most attractive plant, though not of the highest class.

R. CRASSUM is one of the Chinese forms of the MADDENII series so ably described by Mr. Hutchinson. The flowers are white with yellow blotch, the plant is a free grower and at any rate hardy in Cornwall.

R. FARGESII, a bush of medium size, and apparently easy of cultivation. It is a free bloomer, the truss is loose, the flowers, about 2½ inches across, are usually a shade of pink; they show great resistance to frost. The flower and dull grey leaf are a very pretty combination.

R. FORTUNEI Series. For length of flowering season, for truss, for substance, and for general value to the hybridiser this series will probably prove of greater value than any other. Wilson's forms for late flowering and Forrest's forms for substance and truss are alike remarkable. They have one common weakness, they show the result of heavy rain or of a bumble bee's visit by a brown bruise in a far greater degree than I have noticed with any other hardy rhododendron.

R. HÆMATODES. This may prove to be a most popular rhododendron. It is of dwarf and spreading habit, the leaf has a thick brown tomentum, and the flowers, which promise to open late in the season, are bright scarlet. In Cornwall it does not seem to be a plant easy of cultivation, but it does not follow that it will not prove a good plant in other parts of England. Apparently it is perfectly hardy.

R. MACULIFERUM. A small shrub with loose truss of pale pink to white, campanulate bells with crimson spot, the buds are pink before opening. It flowers in April. As a woodland plant it shows great refinement when in bloom by itself, but it undoubtedly requires isolation.

R. MICRANTHUM. A bushy plant of medium size. The very small ivory white flowers are freely produced in many flowered trusses, and when they are open the plant closely resembles a Ledum.

R. NERIIFLORUM. There seems to be two forms, one being of a spreading and the other of a more upright habit. The truss is loose, but the flowers and also the calyx are in some cases a remarkable shade of tomato-red and very striking. I consider this plant for garden effect likely to prove itself one of the most valuable of Forrest's discoveries. It flowers in May and seems easy of cultivation.

R. ORBICULARE. When well-grown, this is a most striking plant, both in flower and out of flower. It is of flat spreading habit as far as my experience

goes, but I see Mr. Bean describes it * "up to 6 or 9 feet high." Probably there is more than one type. The flat habit and the deeply cordate, somewhat rounded leaves give the plant great character. The campanulate flowers, which are borne in a loose cluster, open deep rose. It seems to be a very difficult plant to grow well and is scarce.

R. OREODOXA. When I first saw this plant in bloom I was disappointed, and I did not consider it of garden value. I now willingly admit that when it is not absorbed by its surroundings it is well worth growing. The flowers open pink and rapidly fade to white.

R. RIREI. The flowers have been described as white, but all the plants I have seen have had purple flowers with darker blotch. It opens early in March, and when in bloom is quite a striking plant. The foliage is not a good green, which, together with the early flowering, will probably prevent it becoming a popular plant.

R. SOULIEI. In Cornwall this is a very difficult subject, and most of the plants I know in the West have brown tips to their leaves. I have seen it very good in other parts of England, and it should certainly be tried, as its glaucous leaf and rose flowers make it when in health a very lovely plant.

R. SPINULIFERUM. This is an unusual plant, the flowers certainly do not convey the popular idea of a rhododendron. They are in a cluster, not a truss, quite tubular, with protruding anthers. Colour red with a tinge of yellow. It seems hardier than was at first expected.

RHODODENDRONS REMARKABLE FOR THEIR FOLIAGE.

There will certainly be very many remarkable foliage plants among the Chinese species lately come to hand, but of the earlier ones I would like to briefly mention the following, which are sure to be popular, owing to their great character of leaf. I have not seen any of them in flower. I refer to SINOGRANDE, FULVUM, HABROTRICHUM, ERIOGYNUM, GLISCHRUM.

R. SINOGRANDE. This truly magnificent plant is thought by some experts to be the finest foliage plant that is hardy anywhere in Britain. I understand it has been killed by frost in the colder parts of England. The size of the leaf inevitably arrests attention, and the beautiful bronze colour as it unfolds, with its highly glabrous face at all seasons, insure it being a distinguished plant anywhere. Plants in the young stage, say four or five years, generally show the maximum size of leaf, and at this age I have measured the actual leaf of SINOGRANDE 22 inches long.

R. FULVUM has a large leaf with the most beautiful bright apricot felt of any plant I know.

R. HABROTRICHUM is remarkable for the bright crimson bristles rather than hairs on the young growth, these are retained for a long while.

R. GLISCHRUM and R. ERIOGYNUM are both remarkable for leaves which give a wonderful colour effect with a quality and finish which may be said to resemble velvet. In the case of GLISCHRUM this is due to the presence of well-defined hairs on the upper surface of the young leaf, and in ERIOGYNUM to a felty bloom.

P. D. WILLIAMS.

* Wilson in Plantæ Wilsonianæ, Vol. I., p. 540, gives the height of R. orbiculare as 1·5 to 4 metres high—say 5 to 13 feet.