Vol. II., No. I., 1920.

The Rhododendron Society Notes.

REPRINTED BY
THE PACIFIC RHODODENDRON SOCIETY

Acknowledgements

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In particular, we are indebted to Fred Whitney, the last remaining officer of the Pacific Rhododendron Society which produced and published the facsimile edition in 1976, who has so graciously allowed it to be scanned to create the current version.

RHODODENDRON, CAMELLIA
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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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NOTES

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MEMBERS OF THE SOCIETY

FOR THE YEAR

1920

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

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The Rhododendron Society Notes.

MEMBERS NOTES FOR THE YEAR 1920.

INDEX TO VOL. II., PART I.

A LECTURE BY MR. GEORGE FORREST ON RECENT DISCOVERIES OF RHODODENDRONS IN CHINA.

Delivered to the Members of the Rhododendron Society, at the Linnean Society's Rooms, Burlington House, Piccadilly, W., on Tuesday, November 16th, 1920.

Mr. Gerald Loder: I move that Mr. J. C. Williams takes the chair.

The Chairman (Mr. J. C. Williams): There is no Agenda and I have only to tell you that Mr. Forrest at the end of the meeting will be glad to answer any questions, and anything which turns up during the lecture which may interest you and you have made notes of, he will deal with them at his leisure.

Mr. George Forrest: In recent years our knowledge of the genus Rhododendron has so increased that, except for those engaged in the actual work of collecting and determination, it has become a somewhat difficult task to keep pace with the large number of novelties described. As late as 1907, 305 was the total of species known, of which 46 were Indian and fully 136 Chinese, but now that total has been more than doubled, and one may safely say that 80 per cent. of the new species have as their home the Alpine region of North-West Yunnan, West China. Unquestionably the greatest concentration of species is to be found in that wild and rugged region lying on the China-Tibetan frontier, formed by the continuation of the Himalayas, which at that point turn due southward from the Tibetan plateau, and in a perfect chaos of peaks, spurs and ranges enclose the water systems of the Salwin, Mekong and Yangtze.

(The first slide, a map of Yunnan showing the Yunnan-Burmese frontier was then thrown on the screen).

Here we have Tengyuch which is on the road from Upper Burma, and shows the country I have been working in. The route I travelled by is across eastwards to Talifu, and from Talifu on to the North. The nucleus and radiating point of the genus I place somewhere North-West of Batang, approximately in latitude 33° N., longitude 95° E., in the Tibetan province of Tsarong or Chiamo.

The whole lesson of my ten years' exploration of Yunnan and South-West Szechwan, when speaking of the genus, is told in a very few words. Travel north-westwards and the species are ever on the increase, break east or north and immediately there is a marked decrease. From somewhere near the above-mentioned point the genus spreads out in a fan-shaped drift south and south-east, gradually thinning off in numbers as lowlands and plains are reached. And though little or nothing is as yet known of the country lying to the west and south-west of Tsarong, between that province and the Brahmaputra where it breaks through the Himalayas into the plains of Assam, I do not consider it

rash to say that when that region is explored it may prove as prodigal in its flora as Tsarong and North-west Yunnan.

There is little doubt that the highly specialised and exuberant flora seen on the Chino-Tibetan alps, in which Rhododendron is such a prominent feature, is due in great measure to the geological formation. Practically the whole of the area, from 7,000 feet to the altitude of the highest known peaks, which run to about 23,000 feet, is capped with limestone. In the lower valley levels, below 7,000 feet are found other strata such as slates, sandstones, shales, clays, etc., and there one sees a totally different flora, the line of demarcation being most pronounced in certain districts. In the higher valleys, and the still higher plateaux, the soils are heavy reddish clay-marls, gritty limy clays and loams, lime-silts and cements.

(Slide.) This shows a point in one of the upper altitudes. Practically the whole meadow is filled with this formation (pointing to the slide) which is washed down from the range and is almost like China clay. Many of these enclosed valleys and plateaux, some of them of considerable extent, such as that of the Lichiang, Hoching, Chien-chuan and Teng-chuan, give every evidence of having been the sites of extensive lakes; the bed rock is composed of an extremely hard lacustrine deposit varying from a crust of a few feet to over 100 feet in thickness, built up in all probability from the debris of glaciers. In the Tali valley there is still the lake, a body of water 35 miles long by 6½ miles in breadth, but that, if one may place any reliance on native evidence, is in process of shrinking. The limestone of the country has nothing chalky in it, but is apparently a strong magnesian limestone, greyish-white in colour, very hard and durable, such as is seen in the Dolomites.

Towards the Tsarong frontier on the Mekong-Salwin divide where, I think, I found a greater number of new Rhododendrons than in any other area explored, the strata, though still limestone, is much freer in composition, more readily disintegrated and deeply stained ruddy-brown by the presence of minerals.

In recent years there has been much discussion regarding lime and limy soils in connection with the cultivation of Rhododendrons, and many experiments have been and are still being made with species from the Yunnan limestone area, though so far with very little success. As I am not a cultivator, I am not in a position to give a definite opinion, but were I asked I should suggest that failure arises from the limestone we have here being of different composition to that of North-west Yunnan. Certainly most of the Rhododendrons I have collected grow directly in or on that limestone. The lower level plants such as RHODS. RACEMOSUM, OLEIFOLIUM, MICROPHYTON, RIGIDUM, SPINULIFERUM, AUREUM, TRICHOCLADUM, etc., are found flourishing in soils heavily charged with limestone-rubble, whilst species such as RHODS. CRASSUM, NERIIFLORUM, BULLATUM, FLOCCIGERUM, SANGUINEUM and all its allies, IDONEUM, DIACRITUM, YUNNANENSE, PRÆCOX, HÆMATODES, SALUENENSE, APODECTUM, CILICALYX, nearly all of the CEPHALANTHUM group, BRACHYANTHUM, DICHROANTHUM, and a host of other species belonging to the groups those named represent, have their roots fixed in the crevices of limestone cliffs and boulders or in the limy rubble at the bases thereof. The taller tree species,

though having a bed of humus for support, have their rootlets similarly placed, or at least overlying or in contact with the limestone.

(Slide—Rhod. taliense). This is a truss of RHOD. TALIENSE, one of the species on the Tali range. The flowers are white-flushed pink on the exterior with crimson markings. This is one of the biggest plants I have seen in the highest altitudes. Even those which may be classed as bog-plants occupying as they do boggy peaty pasture (generally the character of the openings in pine-forests at higher altitudes) as RHODS. HIPPOPHÆOIDES, SCINTILLANS, TELMATEIUM, etc., though luxuriating in soil of more or less peaty consistency with abundance of moisture, are in a surface soil which is shallow, seldom more than 18 inches in depth, most often much less, with beneath a deep layer of limestone-gravel through which, during the rainy season at least, water is constantly flowing.

(Slide.) This shows a picture of a bank of R. HIPPOPHÆOIDES and in front you have a boggy meadow with patches of water. The picture was taken principally for the plant in front, and the next picture shows the same meadow with a very large mass of plants growing behind the bog, quite a typical sight at that altitude.

Of course too much stress cannot be laid on the fact that all those Rhododendrons have as a bed, or a support at the least, a certain amount of peat or humus; even those growing in the most barren exposed situations, on cliffs and boulders, as they attain a certain size gather around them a quantity of vegetable debris which eventually becomes soil. From all of which, naturally, the plants must extract a certain amount of nourishment, but still it is difficult to believe, as many people assert, that the limestone plays little or no part in the existence of the plant. One great fact remains, that, in Yunnan, if one gets beneath the altitudinal level of the limestone formation or beyond it, Rhododendrons, both in numbers and species, are few and far between. At least such has been my experience.

Nearly all Rhododendrons under natural conditions are social plants, a fact which, were we to acknowledge it in our treatment of them would, I think, tend to greater success in their cultivation. Very few are found as isolated plants; one or two I have noted, but as to whether it is a natural condition of the species, I cannot say. R. GRIERSONIANUM, a most symmetrical shrub found in the open country at the head waters of the Shweli valley on the Burmese frontier, is one. It attains a height of 5 to 8 feet, and has large blooms of the STAMINEUM type of a most beautiful shade of soft rose-scarlet, almost vermilion in some lights. Another species with brilliant flowers, of a shade of deep scarlet which grows in almost single plants is R. SPINULIFERUM, but, though this species is not gregarious, it is usually found in dense scrub which it overtops by a foot or two, and so has the protection and support which is apparently desired by all members of the family.

But all others are found in masses, covering from acres to square miles in extent, and where one species does not entirely dominate a situation several or many have apparently adapted themselves to environment for the necessary

mutual protection. This is especially evident in some of the deeper side valleys of such a range as the Tsang-shan, the mountains which form the western boundary of the Tali valley where one finds RHODS. BRACHYANTHUM, NERIIFLORUM, HÆMATODES, and others, whilst luxuriating in their shade, is seen the beautiful R. CAMPYLOGYNUM with its minute Buxus-like foliage and graceful plum-coloured solitary blooms.

At higher altitudes and more open situations the tree-species form impenetrable thickets and forests of vast extent to the complete exclusion of all other ligneous vegetation, banding the mountain sides with colour, and presenting in late May or June scenes of indescribable beauty. These forests may contain many species, and that is generally so, though often one species is dominant. One such, R. TRAILLIANUM,—which is a shrub of 25 to 30 feet with flowers white or white-flushed rose—I noted in 1917, on the Eastern flank of one of the spurs of the Bei-ma-Shan, in a belt nearly three miles in length, and clothing an altitude of fully 1,000 feet, so densely flowering that at a distance of some miles the mountain side seemed veiled in a silvery sheen.

One interesting feature of the Rhododendron seen in the Northern area of the province—particularly striking on the Mekong-Salwin divide—is that the greater number of species are most luxuriant in situations having a Northern or North-Eastern exposure. This is most pronounced in the lateral valleys draining eastwards from the summit of the divide into the Mekong. Most of these valleys are rugged in character separated by sharply defined spurs, heavily clothed on the Northern face with dense forests and thickets which, above a certain altitude, are composed chiefly of Rhododendrons, whilst the southern faces are mostly bare rock-strewn grassy slopes or covered with scrub or more or less dry pine-forests.

Three degrees further south, towards the South-West or Central-West of the province, a totally different distribution prevails, especially on the frontier ranges, those forming the Shweli-Salwin and N'Maikha-Salwin divides. There it is mostly the western flanks which bear the heaviest vegetation and there the greatest wealth of Rhododendron is seen. That is undoubtedly due to the much heavier rainfall and comparatively higher temperature during the monsoon season. Still, those ranges attain an altitude of 12,000 feet, or slightly over that at one part, are snow clad during the winter as low as 6,000 or 8,000 feet, with the atmosphere exceptionally dry and frosty. Thus it is possible to conclude that many of the species might prove hardy with us. On their Eastern flanks the dry, death-like atmospheric conditions of the Salwin valley forbid any wealth of vegetation other than what is purely tropical, or sub-tropical in character, up to 9,000 feet or thereabout; above that to the summit what arborescent vegetation is seen is dwarfed and stunted. These conditions obtain as far North as I have explored on those ranges—approximately Lat. 27° N.

(Slide, Shweli-Salwin divide). This is a typical picture of the Western flank of the Shweli-Salwin divide, the home of RHOD. SINOGRANDE and others, and these growths are simply on chalk with tropical vegetation, gradually thinning off to temperate vegetation, and to alpine at the crest.

During two years spent at Tengyuch as a base my men and I explored the Shweli-Salwin range as thoroughly as possible, and a very fine haul of new species was made. I had been quite prepared to find there more or less a linking up with the Indian Rhododendrons, for, geographically the area is in Burma, the Shweli and N'Maikha draining into the Irrawadi. However, it did not prove to be so, for the affinities of the species found are more with those seen in the North of the province.

In the short period mentioned it was impossible to complete the work; almost certainly many species yet remain to be discovered, for many of the side valleys and ravines, choked as they are by dense forest and scrub formations, may remain unexplored for years.

Of the species found the finest is R. SINOGRANDE, which forms fairly extensive forests, and is also seen at lower altitudes as isolated specimens in open pine and mixed forests. It is a magnificent foliage-shrub, 25 to 35 feet in height. I have seen leaves measuring 26×12 inches or even more, and many of the hill tribes use them for thatching their huts. The flower-heads are very large, the individual blooms borne on very stiff pedicels are also large, widely campanulate, fleshy and brittle, of a dull white colour with a blotch of deep crimson at base. A plant of merit either for flower or foliage.

Another large-leaved species, of 20 to 30 feet, forming forests higher on the range is R. BASILICUM. The flowers, as numerous as in R. SINOGRANDE, but of better form and substance, are pale-yellow with a crimson blotch. I have seen blooms of this species heavily flushed with crimson.

Yet another fine species, growing in the shelter of pine forests as well as in the open is R. HABROTRICHUM. It is a shapely shrub of 4 to 8 feet with rose-coloured blooms.

Another found in like situations belonging to the Ovatum Series is R. AUSTRALE. It is a very free flowerer, forming symmetrical shrubs of 6 to 10 feet, with attractive dark-green, glossy foliage and blooms deep rose with crimson markings.

Two fine plants of the Triflorum Series are R. ERILEUCUM, 6 to 9 feet in height, with white flowers, and R. ZALEUCUM, of 6 to 20 feet, with blooms white or pinkish-rose, flushed a deeper shade. Except in size the foliage is much alike in both, having a beautiful bluey-grey wax-coated under surface.

R. DIAPREPES, 10 to 12 feet in height with fragrant blooms 4 inches long, white or flushed rose, and another beautiful shrub RH. RASILE are both allied to the R. DISCOLOR of *Franchet*.

R. FULVUM is one of the species forming thickets at mid-altitude on the range and has flowers deep rose in colour, sometimes even purple-rose, especially in bud, and very handsome foliage.

Two excellent new species of the Maddeni Section, both with very large blooms, are R. MEGACALYX and R. SINONUTTALLII. The corollas are very widely funnel-shaped, waxy white with or without a touch of yellow at base,

flushed purplish-rose outside and deliciously fragrant. The flower of R. MEGACALYX is 4½ inches long, that of R. SINONUTTALLII fully an inch more.

(Slide.) Forms of R. CILICALYX are abundant on many of the cliffs in side valleys, though the finest form of that group—R. SCOTTIANUM—is found much further to the east.

This is one of the finest forms on the hills round Tengyueh.

R. ÆMULORUM is an exceedingly attractive species of the Hæmatodes Section, with deep crimson flowers and beautifully wrinkled dark-coloured foliage, coated on the under surface with a heavy reddish-brown tomentum. It is a plant of the N'Maikha-Salwin divide, as also is R. JENESTERIANUM, an unique plant, 4 to 6 feet in height, with large willow-like foliage and loose umbels of numerous small nodding plum-purple blooms identical in appearance and substance to those of R. CAMPYLOGYNUM, and borne on long pedicels.

Another grand large-leaved species from that divide is R. SIDEREUM, 8 to 20 feet in height, with flowers a clear yellow, blotched crimson at base, whilst R. MACKENZIANUM, one of the Stamineum group, 12 to 30 feet in height, is common in both ranges. This last has very large flowers, narrowly funnel-shaped, rather fleshy and fragrant, in colour ranging from rose to deep rose with a greenish blotch at the base, the tube very deep purple.

I have already mentioned R. GRIERSONIANUM, the flowers of which I consider one of the finest bits of colour I have ever seen.

Another species, similar in habit to R. GRIERSONIANUM, found in pine forests as well as in the open, is R. NEMATOCALYX. It is a shapely shrub of 8 to 12 feet, with loose umbels of few but large flowers of the Stamineum type, white or white-flushed rose. I will show you now a single truss of this species. (Slides 10 and 11).

Other large-leaved species forming forests and thickets on the range are R. MEGAPHYLLUM, 10 to 30 feet, with flowers yellow-flushed rose; R. PREPTUM, creamy-white; and R. ARIZELUM, 10 to 30 feet, with companulate blooms, yellow in colour, flushed rose.

At higher altitudes are found forests of R. PLEBEIUM, a fine species of the Heliolepis Section, with deep rose-coloured blooms marked crimson. Also R. STENAULUM, another of the Stamineum group; whilst yet higher is found R. callimorphum, a shrub of the Souliei group, 4 to 8 feet in height, with flowers in loose umbels closely resembling in colour, form and texture, those of R. orbiculare. In company with that is seen the beautiful R. Meddianum, a species of the Thomsonii Section, 4 to 6 feet in height, with loose, umbels of 5 to 7 very large fleshy deep crimson blooms. The last two species form close thickets on boulder-strewn slopes.

Towards the summit of the range are many beautiful dwarf species, such as R. APODECTUM, with crimson flowers flushed orange-yellow at base; R. THEIOCHROUM with sulphur-yellow flowers and dark-green, glossy, leathery foliage; R. LEPIDOSTYLUM, a yellow-flowered species of the Trichocladum Series. R. LASIOPODUM and R. ROSEATUM are seen at about the same altitude, whilst above, all in the wildest and most barren situations, is found the beautiful yellow-flowered dwarf of the Ciliatum group, R. VALENTINIANUM.

Again, last autumn on one of our last journeys to the foot-hills of the N'Maikha-Salwin divide we found what is at present the tallest known species in the genus now named R. GIGANTEUM. Only a few specimens were seen though possibly it may yet be found in greater numbers in other areas. The largest tree was measured. The height just reached 80 feet, the spread of branch over 40 feet, whilst the trunk at five feet from the ground was 7 feet 9 inches in girth. The bark is rough for a Rhododendron and of a light greyish-red colour. The largest leaves ran to about 13 to 14 inches. Unfortunately the species being apparently an early flowerer, as many of that region are, we only secured specimens in fruit, leaf and flower-bud, the latter too immature to give even a hint as to the colour or form of the flower. A fair quantity of seed was collected.

From Tengyueh to Talifu is a journey of twelve days, some 280 miles, the road winding over the water-sheds of the Shweli, Salwin and Mekong, which last in that latitude traverses a very deep and precipitous gorge. Beyond that the country gradually rises towards the Western flank of the Tali Range, the actual base of which is about 6,000 feet, thence round the Southern end of the range and North to the City of Tali, which lies at the Eastern base of the mountains at about 6,500 feet altitude. Fully two-thirds of that valley area is occupied by the beautiful lake Erh-hai, the actual plain, of small extent, lies along the base of the range which towers directly west of the City to an altitude of fully 14,000 feet.

Though the altitude of the valley is approximately the same as Tengyueh, lying so much farther east and north, and with the proximity of such a huge range, the climate is more rigorous. The winter is quite severe ; for four months of the year the snow descends to about 1,000 feet above the valley—occasionally even that is coated for days—and the atmosphere is dry and frosty. In summer the rainfall is fairly heavy though there is no excessive heat.

(Slide, Tali Range). This gives a picture of the range taken on the eastern fringe in mid-January. The limit of the scene there is about 1,500 feet above the plain, approximately 8,000 feet.

Much of the country between Tengyueh and Tali is of a highland pastoral character, the summits of the intervening ranges rise from 9 to 11,000 feet, clothed with pine forests, with scrub and thickets in the more enclosed side valleys. Little of that country has been explored ; though I have been over the route some eighteen times, I have only collected on and at short distances from the road, so that is yet another field which should repay investigation. For the greater part of the way R. DELAVAYI is abundant everywhere, forming forests and thickets alone or in company with Conifers and deciduous trees, gradually thinning off in numbers as the Tali Range is approached.

(Slide, R. DELAVAYI). This is not a very good picture of it. It was taken very early in the morning before we broke camp, and it was taken partially against the light, but it is not an abnormal specimen at all. There are plenty of trees taller than that and of much better growth.

From what I have seen of the species it seems to do best in rather dry situations, and is the one Rhododendron I have seen thrive on a slate formation. Nearly all these lower valleys running below the range dip below the limestone. It attains a height of 30 to 35 feet—this specimen is about

30 feet, I should say—and in the late spring fromMarch to April makes a brave show with its handsome blooms which range from deep vivid crimson to the brightest cherry-red. It flowers very profusely.

(Slide, R. Racemosum). In this picture R. RACEMOSUM is seen on the high lands, not between the valleys. Whilst R. RACEMOSUM is fairly abundant on the higher clayey downs so characteristic of that portion of the divides, on the dryer uplands forms of the Fortunei Section are seen everywhere.

Many of the forms seen of R. RACEMOSUM differ considerably from the type. (Slide). This is a form which was found two days' journey from Talifu. It differs altogether from the type which dominates most of the area there, which is a spread-out shrub. It is quite irregular, and there was a considerable number of plants growing in the one spot, but was covered with plants much the same as the typical Racemosum—with almost a white interior to the flower in some of them.

As the Tali Range is approached R. SCOTTIANUM and R. MICROPHYTON become the dominant species, both exceedingly free-flowering, the former, as I have already said, the finest of all the CILIICALYX group. Many of the rocky hillsides are flushed pink and white, with the masses of bloom. Both are shrubs of 4 to 7 feet, and of R. MICROPHYTON which, so far as I know, has not yet been introduced, I have seen specimens so smothered in the small blooms as scarcely to show a leaf.

(Slide). This shows you a photograph of R. SCOTTIANUM. The flowers are very open, and their tips will be almost pure white, and occasionally flushed pink on the outside, and with a yellowish-green blotch at the base and always fragrant.

The next slide I will show you is the truss of it.

Another splendid spot still unexplored is the Western flank of the Tali Range, a stretch of country 40 to 50 miles, clothed in heavy forest from its base to 12,000 feet. I have only been on it on two occasions, during one of which I found the finer darker-flowered form of the true R. LACTEUM of *Franchet*, a fine shrub of 20 to 25 feet, with dense trusses of large beautiful canary-yellow blooms, a soft yellow, with nothing transparent about it. This is the species with which R. FICTOLACTEUM was so long confused. The latter is a totally different species with white flowers, blotched and marked deep crimson. From seed secured then the true R. LACTEUM is now in cultivation.

Owing to the great bulk of the Tali Range acting as a screen, the rainfall on the Western flank is greatly in excess of that on the Eastern, and thus the heavier vegetation. The same applies to practically all of the greater ranges of Western Yunnan, owing to their North and South trend they have a wet and dry side.

(Slide, Gorge on Tali Range). Exclusive of the lateral gorges which score the Tali Range from summit to base, there is little arborescent vegetation on the Eastern flank below 9,000 feet, above which forests of Conifers begin to show and carry up to the Rhododendron thickets, and these to the actual alps. That range was the scene of most of Père Delavay's collecting, and will always be associated with his name. Many excellent Rhododendrons were discovered

there by him, such as RHODS. BULLATUM, HÆMATODES, NERIIFLORUM, BRACHYANTHUM, YUNNANENSE, TALIENSE, CAMPYLOGYNUM, LACTEUM, RUBIGINOSUM, CYANOCARPUM, SULFUREUM, IRRORATUM, TRICHOCLADUM, AUREUM, CRASSUM, OLEIFOLIUM and others, all beautiful plants most of which have since been introduced to cultivation.

(Slide). This is a single truss of R. BULLATUM.

On the lower dry grassland slopes are found many fine and brilliant forms of AZALEA INDICA in conjunction with which are seen R. AUREUM and R. OLEIFOLIUM. The latter I have always considered a superior plant in every way, more graceful in habit, foliage, and especially flower, than its ally R. RACEMOSUM, and I think most people would judge so were they to see the two species in situ.

In the gullies and on their rocky flanks amidst heavy growth of cane and deciduous shrubs are found RHODS. HÆMATODES, NERIIFLORUM, YUNNANENSE, BRACHYANTHUM, and the tiny R. CAMPYLOGYNUM, whilst on the cliffs are RHODS. BULLATUM, SULFUREUM, and CRASSUM. R. TRICHOCLADUM loves more open situations, rocky grassland on the spurs themselves.

(Slide). This Rhododendron CRASSUM is a cliff plant, and is the commonest plant in that area. In the gorges it never attains to more than 2 feet or 3 feet at the most. The flowers are almost pure white, with flush-pink on the outside and very fragrant.

Above the altitude of the gullies and within the pine forests, and forming forests themselves at still higher elevation are found RHODS. IRRORATUM, CYANOCARPUM, RUBIGINOSUM, TALIENSE, and LACTEUM. The last is rather a rare species—during several years' collecting I only saw two groups of it. It has canary-yellow flowers, and is a smaller tree, smaller even in foliage than R. FICTOLACTEUM, of which presently I shall show you a picture. R. FICTOLACTEUM is not, so far as I know, on the Tali Range. It was originally collected near the summit of the Lang-kong-Hoching divide, near Yen-tze-hay by Delavay.

(Slide). This picture shows R. IRRORATUM. It is a type which always grows as a scrub-plant amongst dense scrub, or in a thicket, and the fact is, apparently that it wants support. I have never seen this Rhododendron in any other situation but this, and the scrub had to be cleared in order to get a photograph.

As on all the Yunnan Ranges here above the Rhododendron belt, the species tail off until the actual alpine moorland and meadows are reached, where the whole landscape is dominated by mile upon mile of dwarf cushion-shrubs of the Lapponicum-Intricatum Series, bearing flowers of every conceivable shade from pure white through lavender and blues to the deepest shades of wine-purple. These formations, magnificent as they are on the Tali Range, are far eclipsed by similar scenes further North, pictures of some of which I shall presently show you, taken in May on the Sungkwei Pass.

(Slide). This shows one of the Lapponicum-Intricatum Series, a typical cushion-shrub, standing out from the mass. That is the sort of country they are found in. This is an individual plant, but in many places you cannot put your foot down without treading on them. They are in masses, and in

all probability, on most of the moors, there are half a dozen species at least intermingling.

Considering the large number of Père Delavay's discoveries, we were fortunate in taking toll of quite a few fine new species: R. JUCUNDUM, a fine shrub of 5 to 20 feet, with rose-pink to white flowers, is of the Souliei group; R. PACHYPODUM, 2 to 5 feet, with yellow flowers; R. PLATYPHYLLUM, with strongly aromatic foliage, and very beautiful membranous blooms, white, delicately flushed rose; R. BLANDULUM of 4 to 6 feet, a fine species of the Selense Section, with flowers suffused deep-rose; R. PHOLIDOTUM, 3 to 8 feet, a most floriferous species akin to R. BREVISTYLUM, having deep-rose purple blooms.

(Slide). This is a single plant of R. PHOLIDOTUM. It is about the average height, 7 to 8 feet, and it flowers much after the same style as Rh. Rubiginosum.

(Slides). R. SYCNANTHUM, of 4 to 9 feet, allied to R. YANTHINUM, growing on cliff ledges, with blooms deep lavender-rose. R. BALFOURIANUM, a very fine species 4 to 6 feet, with large fleshy flowers, pale-rose marked crimson; R. DIMITRUM, with flowers deep-rose. R. PHOLIDOANTHUM, 2 to 3 feet, a shrub of the open hillsides, which has blooms ranging in different individuals from creamy-rose through shades of pinkish-yellow to deep flame-orange. R. RUBROLINEATUM, is a fine and most uncommon shrub of 2 to 5 feet, with small drooping blooms in loose umbels of an ivory-yellow shade, lines and flushed rose. These are only some of the most outstanding species. There are others, amongst them a number of plants of the Irroratum Section, all first-class.

The country east of the Tali lake is of a somewhat arid character. Two days beyond it there is a low range of mountains named the Ghi Shan, and during one year that was explored. Much new material was secured, but only one Rhododendron of note—R. ERIOGYNUM, one of the Irroratum Series, a shrub of 10 feet, forming considerable thickets. The flowers are small, form compact trusses, and are deep crimson in colour.

I shall now show you pictures of typical Rhododendron growth as seen on the Sungkwei Pass. This as a low col, a rugged little frequented pass between the Lang-kong and Sungkwei valleys, three days' north of Tali, of an altitude of 11 to 12,000 feet, comparatively shallow, a broad cleft running almost east and west on the summit of the divide, two miles in length by about half mile broad. The centre is occupied by a small lake with gritty limy meadows and moorland on both sides for a short distance up the slopes.

(Slide). You can hardly see them in this picture. From there to the tops of the enclosing hills, 1,000 feet higher, is Rhododendron forest. The foreground is occupied by matted masses of Intricatums and Lapponicums.

(Slide). These masses of flowers are mostly FICTOLACTEUM, and there are isolated plants of others. It is taken looking down on the gully from quite 500 feet above. The height of the individual plants run up to 30 or 40 feet.

A Member: What is the shrub there in the foreground?

Mr. Forrest: It is a spine-leaved oak, Sir.

(Slide). There is a single specimen of FICTOLACTEUM. Near the part when this photograph was taken, another very fine species of the Irroratum Series was discovered. R. ANTHOSPHÆRUM, a shrub of 20 to 30 feet, free flowering, with blooms bright rose-magenta, marked black-crimson.

Such formations are common on almost every range North and North-West of that point. This single truss of R. FICTOLACTEUM flowers almost white, and intense crimson blotch at the base. Every mountain side in April, May or June is lined with colours visible miles distant, every plateau a veritable flower garden. It is impossible to imagine the wealth of Rhododendron until one has seen it—and then at the flowering period. On the Lichiang Range, the highest point of which is nearly 20,000 feet, on the ranges around Muli, east of the Yangtze, in S.W. Szechwan, on the Ha-ba Range, N.W. of the Yangtze, on the Chungtien plateau, and the Bei-ma Shan, and the Mekong-Salwin divide, everywhere the genus is dominant above a certain altitude, and everywhere there are new species.

It is impossible to do more than name a few of the finer things of which photographs were secured.

(Slide). This is another photograph of the Sungkwei Pass. You get a better view of R. RUPICOLUM here. All this is heath-like formation of Rhododendrons. The centre of the *col* is pure limestone formation.

(Slide). You have another typical scene there, a Rhododendron forest with undergrowth of bamboo.

(Slide). And yet another. One peculiarity about that Pass is—I have already mentioned it— the various Rhododendrons are on the North face. This flank here has a Southern exposure, and it is almost entirely covered with spinous leaved oaks growing to about 70 to 80 feet.

(Slide). This is R. RUPICOLUM, a dwarf rock species, with deep plum-coloured blooms, speckled with golden scales.

(Slide). This is R. VERNICOSUM, a shrub of the pine forests, with pale rose self-coloured flowers, about 10 or 12 feet in height, one of the finest species on the Eastern and Western flank of the Lichiang Range.

(Slide). R. OREOTREPHES. Has very open short-tubed flowers of a soft rose colour, with crimson markings.

(Slide). R. ADENOGYNUM, a rock shrub, with large blooms, flushed and lined purplish-rose.

(Slide). R. BEESIANUM, also with large blooms, which are fleshy and crimson-rose in colour.

(Slide). R. SPHAERANTHUM, found in open forests, with small ball-like trusses of tiny rose tubular blooms.

(Slide). R. IDONEUM, a rock shrub, with purple-blue flowers, having a white throat.

(Slide). R. DIACRITUM and R. PROSTRATUM, two almost prostrate shrubs of the highest alps, found at the very edge of the perpetual snows, the first with small purplish-blue flowers, the last with rather large open crimson blooms, spotted a darker shade.

(Slide). R. EUANTHUM, 10 to 20 feet, a fine species of the Souliei or Selense Section, has handsome flowers, rose-lavender with crimson markings.

I will show you more photographs of a few of these now. This is a truss of the R. DIACRITUM. It is rather a poor picture of it. The next is R. BEESIANUM.

It is a single truss. The next, I think, is R. EUANTHUM. This is a plant of the pine forest, almost in the Northern part of the range up towards the Yangtze.

(Slide). On the Lichiang Range is seen in fullest glory the finer forms of R. CHARTOPHYLLUM and the variety named R. CHARTOPHYLLUM PRÆCOX. They dominate quite an extensive area on the lower stretches of the range, as do also forms (Slide) of R. FORTUNEI, R. RACEMOSUM and R. RIGIDUM.

On the higher marshy meadows is found R. HIPPOPHÆOIDES, 2 to 4½ feet, with foliage silvery-green, and flowers which at their best, are the nearest approach to blue in any of the genus. It is an ally to R. FASTIGIATUM, and is abundant on such meadows at an altitude of 11,000 to 13,000 feet.

I will show you now some pictures of the Lichiang plants.

(Slide). This is R. LEDOIDES, a shrub of about 3 to 4 feet, and one of the freest flowering of the small leaf section.

A Member: Would it not be convenient for us to ask questions at this stage?

Mr. Forrest: Just as you please.

The next picture shows a branch of it.

A Member: Is that R. SPHÆRANTHUM?

Mr. Forrest: No, it is R. LEDOIDES.

A Member: Can you distinguish between the two?

Mr. Forrest: No, not very well.

The next is another plant of the Lichiang range.

It runs up to 50 to 60 feet, but these are isolated specimens growing on the windy range, on the Eastern part of the range. There is a forest of these, I should say, of about 50 to 60 miles in length, at about 2,000 feet altitude. The flowers of these species are white with pink on the outside.

A Member: Is that grassy herbage in the foreground?

Mr. Forrest: Yes, all grass. Alpine pasture.

(Slide). Now we have R. CHARTOPHYLLUM. These, by which the man is standing, are taken as isolated plants, so as to show how it flowers amongst shrub. You never get it in very large masses. It is almost always isolated, 20 or 30 yards between them. It is generally a plant growing in the open.

A Member: Is it of stiff, hard growth?

Mr. Forrest: Yes. There is a great variety and difference in the flower. Some are purplish, some pure white, and one curious point about them is that in some cases if you get white, you get crimson spottings, and if you get purplish shade, green spottings. It is distinct from R. YUNNANENSE. The foliage is much stiffer and harder.

A Member: What nature is the scrub.

Mr. Forrest: Very often oak-scrub. The whole of the range is covered with prickly evergreen oak.

A Member: Do you know which evergreen oak? There must be several species.

Mr. Forrest: Yes. *Q. semicarpifolia* and *Q. spinosa*. There must be several additional species which dominate a very large area, and it is always in the lower altitudes that the shrub is found.

(Slide). This form of R. YUNNANENSE is called PRÆCOX. It is certainly deciduous, but I think it is purely a matter of situation.

A Member: Will it grow taller?

Mr. Forrest: This is about the size of the plant, and in more open situations it takes this form. Although there is no distinct graduation, many of those I have sent home have not yet been determined. This growth is a very characteristic one, as it stands on a limestone outcrop, and you still have oak-scrub here.

(Slide). This is also one of the many forms of R. FORTUNEI, which I have found in the Lichiang range. I do not know what it is.

A Member: What is the altitude here?

Mr. Forrest: Between 10,000 and 11,000 feet.

A Member: Well below the timber level?

Mr. Forrest: Yes.

(Slide). This is a picture of one of the Lapponicums found on the highest plateau. It was simply taken as an illustration of the pictures which are to follow, showing their very wide spread on the highest plateau.

A Member: How high is it?

Mr. Forrest: About 3 or 4 feet. The flowers are purplish-blue without markings.

On the mountains around Mu-li, a small Tibetan village, in the Litang valley, in South-west Szechwan, explored in 1918-19, quite a number of new species distinct from those of Yunnan, were collected. A few of them are: R. AGGLUTINATUM, 4 to 6 feet; R. HEMITRICHOTUM, 2 to 3 feet, with flowers rose-colour, margined a deeper shade; R. HORMOPHORUM; R. PUBESCENS; R. HYPOPHÆUM; R. MULIENSE, and others as yet undescribed. Seed of nearly all of them was secured.

During 1917 and 1918, the Chungtien plateau, the Bei-ma Shan, and the rugged highlands North-east of Chungtien and Atuntze, were partially explored, and many more new species collected.

(Slide). Most of the Moorlands on the Chungtien plateau, and the higher altitudes of the Bei-ma-Shan are densely covered with shrubs of the Lapponicum type, bog and rock plants, so much so that the scenery resembles that of our highland moors where heath dominates; at mid-altitudes, about 14,000 feet, in the damper situations, there are plant associations—as Birch and Rhododendrons—very similar to the Birch and heather formation of our higher valleys. (Slide). Whilst at the higher points on the Bei-ma-Shan, the moors and shallow glens are carpeted for miles with the more dwarf cushion shrubs growing consistently on a lime-rubble soil, drained by small mountain torrents, backed and surrounded by barren rugged snow-clad peaks and screes. The altitude of the Pass is fully 16,000 feet. Even in the height of summer snow is

never absent from the scene, and very little imagination is required to picture just such landscapes at home.

(Slide). This shows one of the Birch and Rhododendrons on the Chungtien plateau. The whole of the country is coated like that for miles, covered with Rhododendrons. The whole sides of the ranges and the meadows are lined with birch and pine.

A Member: Which birch is it ?

Mr. Forrest: I do not know, Sir.

A Member: Are some of those in the foreground birches ?

Mr. Forrest: This is a birch here, they are mostly in birch-formation. You get birch coming out of the thickets to the open and mingling with the Rhododendrons.

A Member: Is there more than one species of birch or does one of the species dominate ?

Mr. Forrest: One of the species dominates that area right through. The colour of the Rhododendron varies from the deepest purple through light lilac-purple to the clearest pink. One pink formation has got on that area.

(Slide). This shows one of the Moorlands. The main track running through the plateau, cuts through this country passing over plateau like this, and deep into the gorges.

A Member: Are forest fires fairly frequent ?

Mr. Forrest: Yes, in many places.

In those two areas a few of the most striking species collected were: R. WARDII, a plentiful shrub in pine forests at 10,000 to 11,000 feet, 4 to 8 feet in height, with fine yellow campanulate blooms, beautifully tipped orange-crimson in bud; R. CHRYSEUM, one of the Lapponicums, of 2 to 3 feet, with bronzy foliage, and brilliant yellow blooms, a most profuse flowerer. I very well remember finding that. It gave such a good show. We were going to mid-day camp, and we saw glimpses of yellow, and looking at it through a glass I saw it was a Rhododendron, and shortly after that we came to the part where it was, about two miles distant and found about three or four acres of plants closely packed with hardly any space between them, and a shower of bloom.

(Slide). R. CLEMENTINÆ, 6 to 9 feet, with heavy leathery dark green foliage and very large flowers which are creamy-white with crimson markings.

(Slide). R. NIPHARGUM, 20 to 30 feet. This was got in the same area, with lanceolate foliage, silvered beneath, and crimson-rose flowers with darker markings.

(Slide). R. CROCEUM, another tree species with large yellow fleshy blooms, marked and blotched deep crimson.

(Slide). R. PURALBUM, of the Souliei section, with very large pure white flowers, and so on to fully thirty species.

Many of the areas around the forest were burnt down, and I will show you how the Rhododendron springs up after the forests have been burnt.

(Slide). We have three species here, possibly more. One of the species is CHARTOPHYLLUM PRÆCOX, and this one is RACEMOSUM, which is growing alongside it here, and is assuming its communal form with the other Rhododendrons. These forms I should say are peculiar to limestone. When the Rhododendrons as well as all the growth around is burnt down and nothing is left, the Rhododendrons spring up into growth again, as is seen in the picture.

(Slide). The next picture shows mostly, the growth of R. FORTUNEI in the same area, with the pine forest behind, and those also you can see tailing off away in the distance here.

(Slide). Another species I found in these regions is R. RUBIGINOSUM, which attains a height of almost 30 feet. It forms a forest sheltered, or nearly always, by a pine forest.

(Slide). You have here a particular area on the Lichiang Range, on the Eastern flank. And here on this spur which is topped by the forest also you have a huge mass of RUBIGINOSUM forming a thicket.

(Slide). And this is typical of the same range showing views of Rhododendron-formation with Alpine meadows, and the usual conditions further in front. In here you have the Rhododendron forest, and this is a single specimen of the R. RUBIGINOSUM.

But all these areas, rich as they are, are eclipsed in number and beauty of species by the Mekong-Salwin divide from 28 degrees N. northwards to far beyond the Southern frontier of the province of Tsarong. There the peaks are higher, the sacred mountains of Doker-la and Ka-gwr-pu surpassing even the Lichiang range in altitude and rugged grandeur, and, as on the Bei-ma-Shan above 14,000 feet, there is scarcely any ligneous vegetation but Rhododendron forest, thickets, and meadows carpeted by them in unbelievable numbers; in the flowering season a riot of colour, gorgeous beyond description; mountain sides splashed with colour like a giant palette. Almost anywhere one can note a dozen species within a hundred yards. Indeed, it is not uncommon to see six or eight species growing together for mutual support.

Such species as R. SALUENENSE with glossy foliage and large open short-tubed deep rose-purple flowers are everywhere.

(Slide). This picture shows R. SALUENENSE as it grows there, clothing the bank.

A Member: What is the aspect?

Mr. Forrest: That was really taken on the Southern exposure from a high altitude.

A Member: What is the colour of the plants growing on the shady side?

Mr. Forrest: Probably deeper; the plants growing on the shady side are everywhere deeper in colour.

(Slide). The next photograph gives the flowers of the R. SANGUINEUM, and also their companions. The shade of the flower seems to be very difficult to photograph. I made several photographs, but I had no screen, no colour screen.

I think you will be able to see the flowers here, but I should explain that this photograph was taken during a frightful storm; we had waited for four days and I was afraid to wait longer, you can see in the picture how the blooms are dashed over with the rain.

(Slide). R. SANGUINEUM, with brilliant scarlet-crimson blooms, and R. FLOCCIGERUM, with pale-green foliage and cherry-scarlet flowers, and R. BRACHYANTHUM are all as plentiful.

Many species known only from types collected in past years by Père Soulie and other members of the French Tibetan Mission, in the Upper Mekong valley, were found to be only the nuclei of groups as, for instance, R. SANGUINEUM, the following new species, allied to that, being collected.

R. EUDOXUM. Flowers dark rose.

R. POTHINUM. Flowers dark crimson.

R. LEUCOPETALUM. Flowers pure white.

R. HÆMALEUM. The flowers of which are practically black-crimson, and looked at reflecting the light, it shows absolutely black, but if you hold it up to the light, you will see a shade of deep crimson.

R. CLOIOPHORUM has a bright rose flower.

R. ROSEOTINCTUM, with flowers creamy-white, margined deep rose.

R. CITRINIFLORUM, with flowers bright lemon-yellow.

R. COMISTEUM. Flowers soft rose with crimson markings.

R. MICROGYNUM, flowers dull rose with deep crimson spots.

This series gives a range of colour unknown in any other section of the genus, and, as I say, it is not uncommon to see many of them flowering in company, you can imagine, more readily than I can describe, the beauty of the scene. Most of them are scrub plants forming bushes of 1 to 3 feet, clothing the slopes and cliffs of the divide.

(Slide). This picture is R. BRACHYANTHUM, which one could tell almost in passing through in the dark. It is odorous, the leaves have a very strong aromatic smell. The flowers are yellow.

(Slide). This picture is R. FORRESTII. Several fine species were added to this group, mostly climbing plants or semi-prostrate, all with flowers with the most lovely shades. Here are a few of them :—

(Slide). R. ERASTUM, with blooms pure soft rose.

R. PORPHYROPHYLLUM, colour deep rose.

R. REPENS. Scarlet-crimson.

R. SERPENS, deep rose without markings.

I saw these species the first time I collected in 1905 (unfortunately all the specimens were lost), growing on boulders. It is found on the ground also, and on margins and faces of cliffs, and one peculiar feature about it is that it roots on the undersurface of the stems. Thus it supports itself. The flowers are almost as large as in the Sanguineum series, and I should like to have got a specimen showing a row of the blooms growing down the stems.

A Member: What colour?

Mr. Forrest: Deep crimson.

(Slide). Another fine species with much the same habit, but of a different phylum is R. TSARONGENSE, flowers white with the tube yellow.

One of the most interesting and beautiful species is R. PROTEOIDES. The foliage is thick and leathery, each leaf with the margins rolled in upon its under surface, so that only a fine streak of the very heavy rich brown indumentum shows. The flowers are large, in compact trusses, canary-yellow, copiously marked deep crimson. It is a shrub of 1 to 2½ feet, found in the most barren situations, a gem, but of very slow growth.

(Slide). R. ROXIEANUM, a shrub of 4 to 10 feet, with white flowers flushed rose, and very beautifully marked crimson, is another new species with close allies in R. RECURVUM and R. IXEUTICUM, both with flowers of much the same size and colouring.

(Slide). This is a photograph of R. IXEUTICUM growing on cliff slopes in a large forest. This specimen is about 4 feet in height, and the next slide shows the flower of it.

(Slide). New Lapponicums were found in R. RUSSATUM, with deep purple blooms, R. DRUMONIUM, with flowers deep blue, R. IMPEDITUM, with blooms a lighter shade of purple-blue, and many others.

(Slide). A few of many large-leaved species discovered are R. CORYPHÆUM, with yellow flowers. R. PRÆSTANS, 30 feet, with rose-coloured flowers.

(Slide). This is a single truss of R. PRÆSTANS. Most of these shrubs grow in places that are difficult to photograph. They are surrounded on all sides by plants of their own kind in Rhododendron forests, all growing on very steep slopes.

(Slide). R. SEMNUM. A shrub of 20 feet, flowers yellow with a crimson blotch at the base.

(Slide). The next photograph shows R. SEMNUM. It gives you an idea of the situations in which they grow, on the slopes in the open.

(Slide). The next shows a truss of R. SEMNUM.

A Member: It is wider at the end of the leaf?

Mr. Forrest: Yes, it tapers away to the base.

(Slide). R. PROTISTUM. A shrub of 20 to 30 feet, which are fleshy blooms, with creamy white-flushed rose. R. COLLETUM, with white rose shading and a crimson blotch. R. DENDROTRICHUM, 15 feet, creamy-white with crimson marking and a blotch, and also R. DRYOPHYLLUM, 20 feet, white with crimson markings.

(Slide). Others of lesser statue, but of equal interest and beauty, found in opener situations are R. FLAVORUFUM, 4 to 10 feet, white soft rose blooms. R. LEPTOTHRIUM, which is 6 to 20 feet, with deep rose flowers. R. RUSSOTINCTUM, 5 to 8 feet, with white flowers margined rose. R. SCHIZOPEPLUM, 3 to 8 feet, rose, crimson markings. R. SETIFERUM, 9 feet, creamy-white, lined rose. R. CHÆTOMALLUM, 3 to 8 feet, deep crimson. R. ECLECTEUM, 6 to 8 feet, crimson. R. FULVOIDES, R. NAKOTILTUM, and many others.

But what has been already done in that far North-West is little else than preparation for the future, it has but whetted our appetites, and from my knowledge I believe that what has been collected is but a tithe of what is yet to come, not only of Rhododendrons, but of many other genera—*Primula*, *Gentiana*, etc. Members of the American Baptist Mission, stationed at Batang, one or two of whom had the opportunity of travelling in Chiamdo, whilst acting as intermediaries between the Chinese and the Tibetans, during the frontier trouble of 1916-17, informed me that the country west and north-west of Batang, as far as they penetrated was of the same character as that I have described, undulating plateau of vast extent and high altitude, enclosed by higher ranges, everywhere clothed in Rhododendrons, great and small, to the exclusion of almost all else. How far country of that character carries west none of us can yet say, but can we doubt the existence of many other beautiful and new species. (Applause.)

A series of slides were then put on the screen showing native scenes of the places visited by the lecturer.

Professor Sir Isaac Bayley Balfour: I rise at the request of your Chairman to give expression to our thanks to Mr. Forrest for the interesting address which he has given to us. We must all have gathered many impressions from it, and foremost of these I would put that of the enormous amount of work which Mr. Forrest has carried through, of the energy and enthusiasm and of the self-sacrifice he has displayed. You will all with me assure him that we appreciate very much what he has done. He has left his mark on the history of the Rhododendron, and that of itself must afford him great satisfaction. Another impression left by this address is that Mr. Forrest's work touches upon interesting biological problems. His has not been only the work of a collector. Of its value in that respect we have eloquent testimony in his discoveries of so vast a number of new Rhododendrons which are beautifying our gardens, whilst at the same time they add immensely to our scientific knowledge of the Plant Kingdom. I wish to direct attention to what Mr. Forrest has pointedly referred in his address—the close resemblance and yet difference between a large number of the forms of Rhododendrons, which he has found. They run in phyla of distinct lines of descent, and near as the members of each phylum are to one another they show sufficient, if minute, characters by which they can be recognised in the field. They are evidently forms developing under the many varying climatic conditions in which they are growing. We have heard from Mr. Forrest of the great altitudinal range over which these plants are distributed in Western China, and he has described the consequent differences in climatic environment to which they are subject—some under the influence of the monsoon—some further east where the atmosphere is drier—and in relation to these environmental conditions we have this multitude of forms in several phyla attaining the impress of microforms of an original type and representing what we may speak of as species in the making. Our difficulty with these at the present moment is that—that differential characters are minute, and dried specimens unfortunately do not preserve these in as sufficiently marked a form as we could desire. I have brought with me to-day, some of Mr. Forrest's dried specimens by way of illustration of that to which I am referring. They belong to the Sanguineum Series, including the deep-coloured R. HÆMALEUM,

and other forms of the phylum. A casual glance at the specimens shows that they are all nearly related to one another and that they differ just in those characters which we could correlate with the conditions under which they grow. In particular the water-relationship seems to be paramount, and its effect is shown in the leaf-form, and the clothing of indumentum on the leaves, particularly on the under side. I have had the benefit of Mr. Forrest's co-operation in connection with the examination of these forms, and of discussing with him their relationship to environment, and now that he is going out again, he will, I am sure, in his future work, give special attention to the conditions under which have been developed, these several forms which are so distinct to the eye, and yet have only such minute individual characters by which their definition can be established. Further information on this point will be extremely interesting, because we shall then have definite observational data upon modifications of forms, within one phylum, and growing within compass of comparatively short distances, in relation to their environment and obtain facts bearing upon the evolutionary problem of the acquirement of characters in Nature. The immediate physiological problem of which I have spoken, is as I have said, that of water-relationship—one of profound significance—and through Mr. Forrest, we have an opportunity of learning how in Nature variation of plant-form for the satisfaction of its necessity may develope in an area of exceptional land-surface and consequent atmospheric conditions. Careful study ought to give us far-reaching results.

There is another biological problem touched by Mr. Forrest's work, and to which he has most emphatically referred, namely, the relationship of these Rhododendrons to lime in the soil. It came as a surprise—which perhaps was greater than it need have been had Botanists given attention to information given by other explorers—when Mr. Forrest first told us that so many of these Rhododendrons grow on limestone, and with their roots actually in limestone-crevices or in a surface-soil of limestone-debris. The repugnance of the Rhododendron to lime is not perhaps so much an idiosyncrasy of the Rhododendron itself as of its handmaid the fungus that it enlists in its service to give it an adequate supply of nitrogen. We have for long known of such a fungus as penetrating or enveloping the roots of Rhododendrons and other plants constituting a mycorrhiza, and acting as adjuvant in nitrogen-feeding. More recently it has been shown that in our common Heather the fungus penetrates the whole plant—even enters the seed, so that when the seed is sown the fungus is with the embryo to help it from the beginning. This aid-giving fungus of the mycorrhiza apparently does not like lime, and because of this repugnance probably experiments in growing these Rhododendrons on limestone in this country have failed. How then we may ask does the Rhododendron thrive in limestone in its home? Mr. Forrest has brought home specimens of some of the lime-material in which these plants grow, and its analysis will, we hope, throw some light upon the soil conditions in which the roots of these Rhododendrons find themselves, and may lead to our being able to cultivate them in soils infiltrated with lime upon the basis of soil-character. But from the biological point of view, Mr. Forrest has made what may be a most important discovery in explanation of how it comes about that these Rhododendrons flourish on their native limestone. He has brought

specimens showing the indumentum of the under leaf-surface infiltrated with a fungus mycelium which penetrates the surface of the leaf after the fashion of the fungus that, penetrating the root, makes the mycorrhiza. In some cases this fungus is so abundant that it changes altogether the character of the indumentum, and becomes itself almost indumentum. The suggestion is an obvious one—that possibly the adjuvant fungi of these limestone Rhododendrons, disliking the lime-environment of the root in the soil have transferred their activities to the leaf in the air, forming what we may call a mycophyllon and function there as nitrogen-suppliers to the Rhododendrons by bringing into combination the free nitrogen of the atmosphere surrounding the aerial parts of the plant. Were this so it would carry further our concept of the mutual dependence of the green plant-world, and the non-green plant world typified in the Fungi. As Horticulturists, it might help us by teaching us primarily the crude method of infecting the Rhododendron leaf with its right fungus, and ultimately lead us to finding ways by which we could give our Rhododendrons nitrogen after the fashion in which on these limestone hills of Yunnan they get it from the atmosphere. Whatever the future may have in store for us in that particular sense, the matter is one to which I hope Mr. Forrest will give some study when he returns to Yunnan by observing the distribution of what I have called mycophyllon in relation to the limestone soil-conditions in which the Rhododendrons exhibiting it are growing, and by observing the relative amount of development of mycorrhiza and mycophyllon.

I say again that we are all under a great debt of gratitude to Mr. Forrest for what he has done for us in the East, and we welcome heartily the interesting story which he has given to us of his experience, and of the plants that he has seen and collected, illustrated by these beautiful photographs, and I convey our thanks to him. (Applause.)

Sir Frederick Moore: Mr. Chairman, I have very great pleasure in seconding the vote of thanks to Mr. Forrest for the very interesting lecture we have listened to. I think everybody will agree with me that it has been a very informative lecture and good humoured, and there has been such an inclination on his part to give information of every sort. I may, I think, distinguish it as a distinctly non-commercial lecture, and therein lies its great value to us all. We are all so accustomed to hear " I cannot inform you about this, because there is some secret in it." Mr. Forrest, however, has put his heart into it, and he has told us what he has seen, and the result is that we have had a most instructive lecture, and our thanks are due to him for his most delightful photographs. There are very few of us who have watched this exhibition on the screen, who have not learned important lessons. These photographs have been most instructive, and very effective, and there are few of us who will not carry away something from the lessons we have had. I am sure we have got great satisfaction from our attendance at this lecture this evening. It has been, as I have said, a most instructive and informative lecture of what I might term garden botany. We have not had merely dried specimens, and in that lies the great charm of the lecture. It is one of those things we do not get sufficient of, and all through the lecture, I think, it must have occurred to those who are interested in plants what a valuable aid photography is in recording a lecture on Rhododendrons, such as we have heard, taken under natural

conditions. In spite of what Mr. Forrest has said with regard to limestone, it must be very different limestone to what we have here, for all our hopes have been shattered in this respect, because Mr. Forrest has said he had seen Rhododendrons growing in limestone, with their leaves flattened against the cliffs. There may be something in what Sir Baylay Balfour has said. It is a new hope, and we have now something to live for. Now we have a new hope that Mr. Forrest will bring us back Rhododendrons that will grow in the limestone. I am sure I only echo the feelings of everyone in this room, when I say how very much we are indebted to the lecturer for his very informative lecture. (Applause.)

Mr. Forrest : I am very grateful for the attention you have given me to-night, for the kind way in which you have received my photographs. I only wish I could have shown you more. I think I may probably return to the Yunnan next year, and I think then that I shall have a chance to have colour photographs, in which case I hope to have the opportunity of showing you these on my return, because the ordinary black and white prints do not show up the colour of the foliage and flower of the Rhododendron. Some are very much alike in their class in black and white, and if we can get a series of proper coloured photographs they will be of interest to the grower and scientist as well. I thank you all, and I am very grateful to all of you. (Applause.)

The thanks of the Society are due to Professor Sir I. Bayley Balfour and his staff at Edinburgh for assistance in preparing the transcript of this lecture for the press.
C. C. E.

RHODODENDRON NOTES, 1918.

I mentioned in my Notes three years ago the number of wasps destroyed in this garden in the early autumn by becoming "birdlimed" when visiting the buds of the very hairy form of BARBATUM (I am not sure but that I ought to call this plant "SMITHII," but at that time I knew of no other name for it except BARBATUM); this last spring I have been interested to note a somewhat similar tragedy befalling the small flies and "solitary bees" visiting certain AUCKLANDII hybrids; when the swelling buds first show colour the budscales are coated with a gummy secretion which apparently is firstly attractive to the above-named insects and then effective "in prevailing on them to stop." A good-sized plant grown under the name "STANDISHII" is particularly successful in slaughtering in this way a large number of insects up to the size of a honey-bee, though I have not noticed a honey-bee itself among the victims; it is difficult to see in what way the plant benefits by capturing and killing these insects.

I fear that the rest of my notes will prove a somewhat uninteresting calendar of weather and of the dates at which certain Rhododendrons bloomed in my garden during last spring.

We had a sharp frost early in January, on the night 8–9th January 16 degrees being registered; on the 19th, we had the first mild day, and on the 29th DAURICUM was in full bloom and MUCRONULATUM (?) opening its flowers; on the 10th February MOUPINENSE was in full bloom and a plant of HOOKERI opening on the 14th, the latter was well out, but another HOOKERI proved to have again dropped its buds. I presume from this it is a less hardy variety as it has quite as good a place in the garden. On 17th February we registered 12° of frost in the open and 8° in the shelter, this frost cleared the garden of all Rhododendron blooms.

March 3rd, the Rhododendrons were recovering from the visitation of a fortnight ago, two forms of SUTCHUENENSE, OREODOXA, DAVIDII and FARGESII, if these three be distinct species, and also BARBATUM and STRIGILLOSUM were flowering well. March 17th, No. 113 Purdom, resembling DAHURICUM bloomed, "CORNUBIA" and ARBOREUMS were also opening flowers. March 24th, R. HUNNEWELLIANUM opened a truss, this plant had been sold to me as R. THAYERIANUM. April 14th, R. MACULIFERUM bloomed, this plant was purchased by me under the number 1886 Wilson, and a professional expert had identified it as R. WATSONII.

Plants of FALCONERI and one of WIGHTII were now blooming for the first time, every shoot bearing a waxen truss; this is not the usual habit of Rhododendrons here when blooming for the first time, they nearly always begin shyly with one or two trusses low down on the North side of the bush.

"BEAUTY OF TREMOUGH" opened well this year; this variety always seems to me very dilatory in opening its pretty buds, and owing to its slowness in this

respect the flowers are here generally more or less disfigured by the frost; though not so consistently good as "GILL'S TRIUMPH." I find it more satisfactory than "GLORY OF PENJERRICK," indeed the latter is so disappointing that I am redraining its bed hoping that its manners may improve in a "dry state."

April 19th, my thermometer only registered 1° of frost in the screen but probably there were more degrees outside; FALCONERI, "ELSÆ" and NIVEUM had their flowers spoilt; but HODGSONII and WIGHTII were unharmed. CAMPYLOCARPUM suffered here slightly, but in other gardens the crop of flowers was ruined. On May 13th, LANATUM bloomed for the first time, a somewhat poor variety.

After the frost of the 19th of April we were not further molested, but on visiting during June a garden four miles to the N.E. and somewhat low lying, I found that it had suffered from June frosts to an unprecedented extent, and that young growths, 6 inches long, on "DONCASTER" had been destroyed, and other hardy hybrids had also been cut up badly.,

STEPHENSON R. CLARKE.

December, 1918.

RHODODENDRONS AT BEAUFRONT CASTLE, 1919.

There was promise of a good show of flower on the early Rhododendrons, namely, "PRÆCOX," FARGESII, DAVIDII, MOUPINENSE, CILIATUM, LUTESCENS, SUTCHUENENSE, WALLICHII, but a snowstorm the last week in April spoilt those in flower and bud. A plant of SUTCHUENENSE flowering for the first time had seven trusses on it. This plant was raised from seed sent by Mr. Wilson from China in 1908. Rhododendrons STRIGILLOSUM, FARGESII, THOMSONII and DISCOLOR seem to be much affected by the long drought whether the plants were in the open or in part shade. Two plants of THOMSONII, although carefully watered and their roots afterwards covered with leaf mould, died and STRIGILLOSUM still looks very unhealthy.

Rhododendron INTRICATUM always flowers here twice a year, in the spring and again in the autumn, and one plant last year had a few flowers on it during eight and a half months of the year.

KATHLEEN A. CUTHBERT.

October, 1919.

EFFECT OF THE WET SEASON ON RHODODENDRONS AT HEADFORT.

It would be interesting to compare notes this season with other seasons, on the growth of Rhododendrons, for, I suppose it has been one of the most sunless and western summers for many years. It is hard for me to express an opinion, as my plants are of no considerable size, or age, and in many cases have not been long planted; but generally speaking the growth has been very noticeable, and even plants moved out last Autumn (1919) have made more than the usual amount of growth—a few were slightly cut by a late frost, for which this year, I think, has been an exceptionally bad one. The following short summary may be of interest.

Oldest Plants.

Thomsonii 8 inches, R. Fortunei 14 inches, R. sutchuenense 1 foot, R. calophytum 15 inches, R. Davidii 6 inches, R. decorum 10 inches, R. Falconeri 8 inches, R. argyrophyllum 6 inches, R. Aucklandii 10 inches, R. discolor 8 inches.

Younger Plants.
(Mostly planted Autumn 1919).

R. Aucklandii × campylocarpum 8½ inches, R. Maddenii 8 inches, R. Lindleyi 6 inches, R. Delavayi 16 inches, R. trichocalyx 5 inches, R. lacteum 5 inches, R. Hodgsonii 4 inches, R. Roylei 4 inches, R. Traillianum 4 inches, R. micranthum 2 inches, R. basilicum 4 inches, R. adenogynum 4 inches, R. hypoglaucum 6 inches, R. chartophyllum 10 inches.

HEADFORT.

November, 1920.

COMMENTS.

Amongst the vast number of Rhododendrons lately introduced, or re-introduced, are some which are rightly accounted of little value by those whose object in cultivating the genus is in the first place to provide effect in their gardens either by way of colour or of form. Amongst these is one which, on account of its extreme insignificance, is likely, if it finds a place in a garden at all, other than by accident, to be given a seat amongst those as the best reserved for plants of " botanical interest only."

Rhododendron (Azalea) TSCHONOSKII, a native of Japan, introduced to this country in 1888 and reintroduced by Wilson in 1914, has received scant recognition by those who have included it in their descriptive lists of the genus. It has however one great merit which seems to have been overlooked and which may enable it to be used with good effect in gardens from which it would otherwise be excluded. At the season of the year at which these notes are being written one is forced into the last entrenchment of one's garden and finds one's chief pleasure in the autumn colour which lights up the fading year. In this R. TSCHONOSKII amply makes up for its complete absence of display at any other period of the year. In the West Country we do not get our full share of autumn colour, but this year we have been well favoured, many plants being particularly good ; yet the half dozen plants of R. TSCHONOSKII, included in the writer's garden, certainly come very near the top for variety and intensity of colour. Being of small stature (plants raised from 1914 seed being not yet 12 inches high) and showing no signs of a spreading habit, it can be accommodated without much sacrifice of space, and to those who value autumn colour it is to be recommended room though it claims no other merit except perhaps the ease with which it seems it can be grown.

Another plant, received from the same source, which the writer has experienced some difficulty in pursuading to grow with any approach to satisfaction, is R. SERPYLLIFOLIUM, and it may be of some interest to other members to know that one or two plants of this species seem to have reached contentment beneath the shadow of a Scots pine, where neither soil nor situation led one to hope for any great response. This is not a plant of any great value if it is compared with other azaleas, although one plant out of the batch raised has flowers of a much deeper mauve than the type, which raises it above its fellows and causes those who do not recognise it to enquire the name. The answer is that it is the " best form " of the species, a distinction far too loosely applied, and which is so misleading that it should surely drop into disuse as a descriptive term.

Already several species have been permitted " best forms," indeed the number of these best forms is only limited by the tastes and opinions of those who grow the plants, and while characteristics of size or colour may appear to one

grower to merit the distinction, to another the term may seem deserved by a form of the same species exhibiting quite different characteristics. This, and the seductive facility with which a plant in one's own garden can thus be distinguished is apt to lead to much confusion, so that in spite of the great increase that has taken place in the provision of names for newly introduced species and forms, it is much to be hoped that when characteristics are sufficiently distinct to admit separation from the type these will be recognised by descriptive terms as *forma roseum*, *forma grandifolium*, etc.

The ever increasing additions to the number of species of the genus and the promise of Mr. Forrest to provide us with many more, must have caused many of us who at one time cherished a vision of seeing in our gardens a complete collection of Rhododendrons capable of being cultivated out of doors, to relinquish all idea of ever getting anywhere near the achievement of our objective, and there may be other members of the Society who, like the writer, have been forced to find refuge and encouragement in the grouping system, and to aim at concentrating their efforts upon one particular group—not to the exclusion of others, or representatives of other groups, but with a view to the study primarily of one particular section, leaving the more general cultivation of the genus for larger gardens. The groups are many and vary in the number of species they include, so that by working on these lines we can select a subject suited to the geographical position, geological formation, and the capacity of our gardens. Moreover, such a conclusion of effort would surely lead to valuable results in time, not only as regards the cultural requirements of the various groups but also, perhaps through the medium of breeding experiments, a more accurate knowledge of the circumference of the circles in which the various groups are enclosed and their relation to neighbouring groups.

If this suggestion finds any response amongst the members of the Society, it will be necessary that the effort shall be co-ordinated to some extent, and in this the Honorary Secretary has consented to assist by keeping a list of those members working on these lines, and to inform others who propose to adopt the plan of the groups already under investigation.

GEORGE H. JOHNSTONE.

October, 1920.

LENY.

Leny is situated about a mile from Callander, in Perthshire, and not far from the Pass of Leny and the entrance to the Trossachs. The site of the present house is a little to the North of where the original structure stood; this was burned down after the Battle of Pinkie in 1547. A narrow valley runs up into the hills at the back of the house, and affords admirable shelter for the shrubs and trees which have been planted along the sides of the small stream. Abundance of ferns, amongst them the oak and beech fern, and quantities of wild flowers some, no doubt introduced, make a very beautiful setting.

Rhododendrons and Azaleas predominate. Some of the Rhododendrons must be very old. The chief glory of the garden is an immense R. CAMPANULATUM, 25 feet high and 60 paces in circumference. When seen in the middle of May it was a mass of blossom. It was figured in "The Garden" of May 4th, 1918, and must be one of the finest Rhododendrons in Scotland. The seed of this Rhododendron was sent from India by Wallich to Buchanan-Hamilton in 1820. Beside it are R. THOMSONII and R. BARBATUM, both nearly as tall, but much less branched. A short distance off is a good specimen of R. FULGENS, several fine ARBOREUMS, and many good hybrids, to say nothing of numerous Rhododendrons of more recent introduction, which all appear to be doing well.

Although extensive forest planting has been carried out at various times on the estate, interest centres in the fine specimens of the rarer trees, some of which have attained a considerable size. Amongst them is an *Abies nobilis* about 70 feet high, *Tsuga Albertiana*, 80 feet or more, *Libocedrus decurrens* about 40 feet, a magnificent cut-leaved beech which girths 4 feet 10 inches at 5 feet from the ground. A fine æsculus, taken to be *Æsculus octandra*, and lastly, the remains of what must once have been a giant Irish yew, now, unfortunately, much reduced in size, owing to damage by snow.

Besides its trees and shrubs Leny is worthy of a pilgrimage as the home of the famous botanist, Francis Buchanan-Hamilton, whose name is inseparably connected with the flora of India. Born in 1762, he was the fourth son of Thomas Buchanan of Spittal and Leny, who married Elizabeth, daughter of John Hamilton of Bardowie, and through her, on the death of his elder brother, he inherited the estate of Bardowie, and took the name of Hamilton. Like so many eminent botanists, he began life as a surgeon, and joined the East India Company in that capacity in 1794. He made journeys in Burmah, Chittagong, Nepal, and Mysore, and sent home many drawings and plants which are now at Kew and in the British Museum. Lord Wellesley had a very high opinion of him, and he accompanied that Governor-General home in 1806. He was elected a Fellow at the Royal Society. He returned to India in 1807,

and made a statistical survey of Bengal. In 1814, he was appointed Superintendent of the Calcutta Botanical Gardens, but retired and returned to England in the following year. He settled at Leny, where he died in 1829. He lies buried in the private burial ground in the garden, and a tablet was erected there to his memory.

The genus *Buchanania* (=*Colebrookea*) was named after him. The older Rhododendrons at Leny probably date from his time.

The present proprietor, Mr. John Hamilton-Buchanan,* Chief of the Buchanans, is the grandson of Francis Buchanan-Hamilton.

GERALD W. E. LODER.

January, 1919.

* I regret to have to add that since the above was written Mr. John Hamilton-Buchanan has passed away. He died in Edinburgh on January 14th, 1919.

G. W. E. L.

CHINESE RHODODENDRON SEEDLINGS AT LOGAN.

Sown on April 29th, 1919, in a mixture of loam, leaf mould, some peat and sand, the young plants for the most part were coming up in three weeks' time. No artificial heat was given. The watering was carefully attended to. A little sunshine was allowed on the plants for an hour each day if there was sun. During the summer the seedlings grew strongly, and with them came moss, but this did not appear to do the plants any harm, and certainly helped to keep the boxes in a uniform moist condition, the moss could not be picked out by any means without disturbing the seedling Rhododendrons and so it was left. In October the seedlings were pricked out into other boxes and planted in soil that had been well steamed. They were then placed in a lighter house without heat and shaded from the sun. By the time the last lot were finished towards the middle of November, the transplanted seedlings all looked in the best of health and showed no signs of damping off ; by this time most of them had assumed a dull purple colour of the leaves, presumably from the stronger light and lower temperature of the air, a little frost having found its way to them, on one occasion as much as 5 degrees, which froze the surface soil of the boxes, but its result was only to improve their appearance, they looked stronger afterwards. Plenty of air was always admitted day and night. At first a sheet of glass was placed over the seed boxes, this was later raised by means of sections of bamboo placed in the soil in the corners of each box as the seedlings grew, allowing of more air.

Now September has come and the seedlings have made their first summer's growth, all have done remarkably well and look in the best of health, hardly a plant has died. It is easy now to distinguish the woodland species from the Alpine, but I know them only by their numbers for they are from seed collected by Mr. Forrest, in China, 1918, and given to me by Mr. J. C. Williams, of Caerhays. I await particulars about this lot. The young plants will shortly be put out in frames, planted 6 to 8 inches apart where they will spend the winter and grow during next summer, then most of them will, if they continue to thrive, be ready next autumn to plant out in their permanent positions. At the same time (April, 1919), were planted in pure peat and sand some seeds of different Indian Rhododendron crosses collected here. These grew with great vigour, with them was one box of R. AUGUSTINII (blue variety), gathered here. The latter (R. AUGUSTINII) now measure 18 inches in height, and are very strong. The peat boxes, too, kept very clean, neither moss or weeds gave any trouble, heather being the only weed to make its appearance, and it was easily removed. These results induced me to plant some seed of Chinese species collected by Mr. Farrer, 1919, in peat and sand this spring, but for some reason these have not grown with the same vigour, with the exception of five boxes in which the peat was steamed, and here there is a marked difference in the size and vigour of the seedlings compared to the ones in the other boxes not steamed. Two boxes, each of Nos. 863, 926, 918 and 1444, were sown, one of each variety in steamed peat, the other not sterilised, they show respectively strong and weak seedlings. It seems evident that steaming the soil destroys some germ harmful to the young plants.

KENNETH McDOUALL.

Logan, *December*, 1920.

RHODODENDRON NOTES—LAMELLEN, 1919–1920.

October 13th, 1919. R. 12968F SALUENENSE *forma* flowered for the first time. Flowers in two's at the termination of the branches bright magenta 1 × 1¼ in. campanulate, filaments rather darker than corolla, anthers dark pinkish brown, style red.

January 14th, 1920. One of the large leaved grande section differing both in leaf and flower from what is usually grown in Cornwall as ARGENTEUM came into bloom. Of this beautiful thing I sent a flower to Prof. Sir I. Bayley Balfour, but have not yet heard what it is. Frost destroyed any hope of seed.

February 26th. With regard to R. 13512F to which the name PACHYPODUM was given, I have just heard from Edinburgh, where I had sent a flower that "it is a much better thing than PACHYPODUM, being the true SULFUREUM—*Franchet* . . . . . a rare species." It is certainly a very charming plant, of dwarf habit, with clear yellow waxy flowers; but it remains to be seen if it will cross with anything which has not the curious crooked style peculiar to BOOTHII, GLAUCUM, LEPIDOTUM, etc., and so far I have only got these species to mate with each other.

In his description of the MADDENII series of Rhododendrons in the Edinburgh Notes, Vol. XII., No. 56, Mr. Hutchinson gives 13512F as PACHYPODUM, and this is now proved to be wrong; the other number he gives is 11547F, and Mr. J. C. Williams tells me that under this no seed came, wherefore the question arises as to whether the true PACHYPODUM is in cultivation at all; which question I hope that someone will be able to answer in the affirmative. Whilst I am on the subject of this description of the MADDENII series, I may say that the illustration of R. LYI by no means does the flower justice, for it is a fine large bloom, almost indistinguishable from that of R. VEITCHII, when grown under glass, though I am bound to say that it is somewhat smaller in the open. The plant itself is certainly one of the hardiest of its series, since two of my plants stood the hard winter of 1916-17 in the open and away from a wall without injury, when many other plants were killed.

January and February were very mild indeed here, and at the end of the latter month fully 40 Rhododendron species and hybrids were flowering in this garden, but a frost early in March browned most of them. Curiously enough four plants of R. SULFUREUM in a very shady place, where they get no sun until late in the day kept their flowers quite intact, which emphasises the value of protection from the morning sun after a frost.

At the end of March, the Hon. H. D. McLaren sent me from Bodnant, in N. Wales, a flower of R. RHODODACTYLUM, one of Wilson's introduction, I believe, though I don't know the number. It appears to be a dwarf-growing hardy plant with deep green oval leaves 3 × 1¾ in., ending in a sharp point, and covered on the under side with a dense cinnamon tomentum. There are seven flowers

in a loose truss, white with lines of pink on the outside, which are more in evidence in the bud stage, 1½×2 in. in campanulate 5 lobed, with black stamens and a yellowish-white style. The plant resembles 6772F TALIENSE, and 1804W, but so far as one can judge from the leaf does not appear to be identical with either.

1st week in April. R. "EUTHOM" ("EMPRESS EUGENIE" × THOMSONII) flowers, 14 in a rather loose truss, a light shade of carmine fading into pink, copiously spotted on the upper segments with crimson; filaments white, stamens brown, style yellowish-white, stigma greenish-yellow. This appears to be the same thing as the plant sent out by Gill, of Tremough gardens, as "pink THOMSONII"; whilst the plant he sent out as "white CAMPYLOCARPUM" seems both from leaf and flower to be a rather small var. of "CAMPAUCK" *var.* "MRS. KINGSMILL."

1st week in April. A truly magnificent variety of R. "CAMPAUCK" flowered, 8 in a loose truss, darkest shade of crimson-red (*Repertoire des coleurs*), 3×3⅛ in., faintly spotted on the upper segment, filaments pale-pink, stamens brown, style greenish-white. I am at a loss to account for the colour of this flower, for CAMPYLOCARPUM was its seed-parent, and AUCKLANDII the pollen-parent. Had the cross been the reverse way one would have concluded that THOMSONII pollen had got on to AUCKLANDII; but this was not the case, nor I imagine can two separate pollens influence one ovum. I have named this plant "GILIAN," after my wife.

3rd week in April. A plant which is probably a natural hybrid 5874F × RUBIGINOSUM flowered. It was raised from Chinese seed under 5874F, but both leaf and flower show distinct signs of RUBIGINOSUM. Flowers in groups 4–6, usually two groups at the apex of the shoot, campanulate, blush-white spotted crimson on the upper segment 1¾×1½ in., 5 lobed, filaments and style white, stamens and stigma reddish-brown.

Also "AMBKEYS" (ambiguum × Keysii) in a better form than previously; flowers in 4 or 5 groups of 2–5 bells at the apex of the shoot, orange outside fading to yellow at the mouth, tubular campanulate, interior yellow with two lines of red spots, 1⅛×1 in., filaments and style yellow, stamens brown.

Also "OREOCINN" (oreotrephes × cinnabarinum), 7 in a loose truss, rather tubular campanulate, but opening widely at the mouth, pale violet-rose, with two lines of brownish-yellow in the interior, 1½×2 in., filaments white, style and stigma greenish-white, stamens light-brown. This was one of the most pleasing flowers in the garden, and considerably more attractive than "YUNCINN" (yunnanense × cinnabarinum) which was in flower at the same time, and which may be described as follows:—9 in a loose truss, rather tubular campanulate but opening widely at the mouth, violet-rose darker on the outside, with two lines of reddish-brown in the interior, 1¼×2½ in., filaments and style violet-rose to white, stigma greenish, stamens light-brown.

2nd week in May. 9054F APODECTUM, 3 flowers in a truss, orange-red densely spotted with brown, 5 lobed, narrowly campanulate 1¾×1½ in., style and filaments paler than corolla, stamens dark brown. Calyx same colour as

corolla, large, deeply cleft, and varying in length of lobes. This bears a close resemblance to the orange form of DICHROANTHUM, but so far APODECTUM has only shown 3 flowers to the truss, whereas DICHROANTHUM sometimes has 7; the leaf of the present sp. is also a trifle smaller, the veins in it are less conspicuous than in DICHROANTHUM, and it flowers about a fortnight earlier.

Whilst on the subject of DICHROANTHUM, a group of seven is very pretty here at the present time—May 25th, 4 of the plants being in flower and have 3 or 4 flowers on each. A plant of LACTEUM, planted in the middle of them is going from bad to worse and will have to be moved, whilst they are the picture of health, whence one may gather that whilst LACTEUM must have shade and moisture, DICHROANTHUM and its allies will stand a dryish place and plenty of sun.

Another pleasant flower is a very pale variety of OREOTREPHES (5873F), which is almost unspotted, and a better colour than the type. I have self-fertilised this and hope to save seed of it.

2nd week in June. R. 13302F HYPOLEPIDOTUM, 3 or 4 in a truss, 5 lobed, sulphur-yellow unspotted, campanulate $1 \times 1\frac{1}{4}$ in., style greenish-yellow curved, stigma green, filaments same colour as corolla, stamens light-brown; calyx deeply cleft light green. A pretty little flower on a dwarf plant.

R. 8938F PLEBEIUM, 6 in a truss, violet-rose, spotted yellowish-brown $1 \times 1\frac{1}{16}$ in., style same colour as corolla, stigma red, filaments paler than corolla, stamens brown. R. E.F (my mark) " *aff.* BREVISTYLUM " 7 in a truss, violet-rose, spotted yellowish brown $1 \times 1\frac{1}{16}$ in., campanulate style yellowish-white, stigma pale reddish-brown, filaments rather paler than corolla, stamens light brown. To the ordinary gardener these two are the same thing, but the botanist may find differences.

2nd week in September. Several seedlings of R. CHRYSEUM, which I owe to the generosity of Mr. Gerald Loder, flowered for the first time. This is a dwarf plant of the Lapponicum series, and is described by Prof. Balfour as the Yunnan form of the Szechwan R. FLAVIDUM, from which it differs in the more scaly leaf, and in having flowers a shade darker yellow.

The frost of early November, 1919, destroyed the flower buds of most of the sweet-scented rhododendrons and many of the AUCKLANDII hybrids, but curiously enough R. " COUNTESS OF HADDINGTON," usually the first to suffer, flowered fairly well. One plant only of EDGEWORTHII, and that against a wall, flowered; and no Maddenii, whilst their Chinese forms BULLATUM and CRASSUM bloomed very well, entirely in the open and without protection.

E. J. P. MAGOR.

October, 1920.

NOTES FROM MONREITH, WIGTOWNSHIRE.

The season of 1919-20 has been a trying one. The bitter snap of frost in November, 1919, which injured so many things, destroying, for instance, most of the flower buds on *Tricuspidaria lanceolata*, did not affect Rhododendrons, except R. BULLATUM, which was killed outright. But 17° of frost on 8th March and 15° on 8th April, following on a winter exceptionally mild, wrought havoc on both growth buds and flower buds of many species of Rhododendrons.

Those which suffered loss of growth buds, thereby affecting the prospect of flower in 1921, were :—DAVIDII, DECORUM, (Wilson's) FLORIBUNDUM, GRIFFITHIANUM, HUNNEWELLIANUM, NIVEUM, OREODOXA, PACHYTRICHUM, SINOGRANDE, STRIGILLOSUM.

The following were unhurt :—AMBIGUUM, ADENOGYNUM, ARBOREUM, ARGYROPHYLLUM, ANTHOPOGON, AUGUSTINII, AURICULATUM, BALFOURII, BARBATUM, CALOPHYTUM, CAMPANULATUM, CAMPYLOCARPUM, CAUCASICUM, CILIATUM, CINNABARINUM, CINNABARINUM ROYLEI, CRASSUM, DAHURICUM, DAVIDSONIANUM, DECORUM (*Franchet's*), DISCOLOR, EDGEWORTHII (on walls), EXIMIUM, FALCONERI, FERRUGINEUM, FICTOLACTEUM, FORTUNEI, FULGENS, HABROTRICHUM, HIPPOPHÆOIDES, HIRSUTUM, HODGSONII, INDICUM, INSIGNE, INTRICATUM, KAMTSCHATICUM, "KEWENSE," LACTEUM (?), "LODERI," LEPIDOTUM, "LUSCOMBIANUM," LUTESCENS, MAXIMUM, MICRANTHUM, MOUPINENSE, NERIIFLORUM, PARVIFOLIUM, "ODORATUM," OREOTREPHES, "PRÆCOX," PHOLIDOTUM, QUINQUEFOLIUM, RACEMOSUM, "SHILSONII," SMIRNOWII, SOULEI, SUTCHUENENSE, THOMSONII, TRIFLORUM, VILLOSUM, YUNNANENSE.

A few other species, whereof I have lost the numbers, have remained unhurt. R. × "NOBLEANUM," beginning to flower on 15th October, never had such a long innings, for, except the November nip, there was no frost till 8th March. The blossom of R. HÆMATODES, GLAUCUM and (partially) THOMSONII were destroyed by frost.

Four of the newer species flowered here for the first time, viz., R. CRASSUM, VILLOSUM, PHOLIDOTUM and MOUPINENSE. R. CRASSUM was so loaded with flower buds that I removed half of them. It is a fine thing in the Maddenii series. Mr. Millais prescribes for it "shade and plenty of moisture." The latter it has had in abundance this year, but standing out as it does on an open lawn it gets all the sun that is going. But ours is not the sun of Surrey. It flowered here near the end of June. R. PHOLIDOTUM, flowering in mid June, proved more attractive than we were led to expect. The foliage is neat and the flowers, freely produced, give the effect of those of R. GLAUCUM. The dark intense crimson of the blossoms of some forms of R. VILLOSUM escape the obloquy of

magenta in virtue of their velvety texture. The effect when the sun shines through them is very fine.

Rhododendron FULGENS has become very scarce in the market. Mr. Millais, hearing indirectly that I had failed to find it in any nursery, most kindly sent me a fine plant, and the late Sir Edmund Loder gave me another when I visited him at Leonardslee a few weeks before his death. I have to thank Mr. J. C. Williams, of Caerhays, for some nice plants of R. GLISCHRUM, a species collected by Mr. G. Forrest in Yunnan. Judging by the free growth this Rhododendron has made during the summer, it promises to be a very distinct and beautiful shrub.

HERBERT MAXWELL.

RHODODENDRONS AT CORROUR, INVERNESS-SHIRE.

These notes refer to desultory experiments made from time to time during the last twenty years in the garden of a Highland Shooting Lodge and the adjoining plantations. The one point of interest is that all the plants described are growing at elevations from 1,250 to 1,500 feet above sea level—a very small altitude compared with those to which many Rhododendrons are accustomed, but one which in our island climate suffices to produce sub-alpine conditions. The exceptionally low temperature recorded at lower elevations do not occur here, but the average temperature is several degrees lower than it is nearer the sea, with the result that periods of frost are prolonged and the growing season curtailed. These conditions cut both ways. Some species, such as R. ARBOREUM, which are with difficulty kept alive in an ordinary lowland climate on account of Autumn and Spring frosts, are quite hardy here, though their growth is nothing like so luxuriant as on the West Coast. Others, such as R. PONTICUM, perfectly hardy under ordinary conditions but late in ripening their growth, are injured every Winter. Snow causes much damage, and the fact that every sheltered nook is a snow trap renders the selection of planting sites difficult. The soil, peat over glacial drift and disintegrated granite and gneiss, is all that can be desired.

We began twenty years ago in the rock garden with R. FERRUGINEUM and R. HIRSUTUM and two small-leaved hybrids bought under the names of R. "WILSONII" and "MYRTIFOLIUM." All these flourish and bloom freely. Next we added R. KAMTSCHATICUM, which forms a dense carpet and is a brilliant thing even among gay alpine neighbours when its crimson saucers expand in June. R. CHAMÆCISTUS was also easily established, but flowers sparingly. Unfortunately hares and rabbits are fond of most dwarf rhododendrons, and leave few flower buds when they raid the garden. Another shy flowerer is that humble cousin of the Rhododendron family, *Loiseluvia procumbens*. It is plentiful on the hill tops here, and some years in July its tufts are crowded with the tiny blossoms and shine like rubies among the grey mosses and stones. Transplanted to the rock garden it never bears many flowers. The Scots plants differ conspicuously from plants of Norwegian origin bought from Messrs. Backhouse. The native form is smaller and darker in the leaf, and its growth is so dense and compact that no twigs are discernable. The Norse form has leaves of pale green and more elongated, and the growth is less prostrate. Where the two meet the Norseman grows over the Scot, and the latter, contrary to tradition, lifts no arm in self defence.

Some years ago I happened to cross the Taurus in late September, riding from Trebizond to Erzerum. The hill tops were covered with R. FLAVUM, and what I took to be R. PONTICUM. Both were clipped by the wind and the goats to a level carpet. The scarlet and gold of the azalea and green and bronze of the Rhododendron mingled in the most sumptuous of colour schemes, resplendent in the sun, but most enchanting where it lay wet and glittering under a low mist.

We have tried on a very small scale to reproduce this beautiful effect on the windswept shore of Loch Ossian, but R. PONTICUM for the reason above noted has been a failure. The azalea on the other hand thrives. It scents the whole place in June, and is lovely again in October.

The contrast in hardiness between R. CAUCASICUM and R. PONTICUM is remarkable. The former emerges quite fresh and green from winters which kill out the latter. The CAUCASICUM hybrids, such as R. "JACKSONII," have the same frost resisting constitution. R. SMIRNOWII on the other hand seems to suffer from frost. R. DAURICUM does well.

The only American species we have planted are the lovely R. VASEYI, which grows 6 feet high, and flowers profusely, and the little RHODORA CANADENSIS. The swamp honeysuckles might succeed and are to be tried. The Ghent hybrids neither grow nor flower well. They seem to require more warmth.

Our experiments with the Himalayan species are on a very small scale, and none except R. CILIATUM have flowered. But plants of R. BARBATUM, R. ARBOREUM, R. CAMPANULATUM, R. FULGENS, and R. THOMSONII, have been planted out for some years and are growing well, though occasionally broken by snow. They have scarcely reached the flowering sizes, but their leaves are of normal size and the picture of health. R. FALCONERI and R. HODGSONII have been added this October.

None of the Chinese Rhododendrons have been here more than two winters. Dwarf kinds, such as R. SARGENTIANUM, R. INTRICATUM, R. FASTIGIATUM, and R. PROSTRATUM, are evidently at home and all these have flowered except the first which was eaten by a hare on the eve of coming into bloom. Of the larger sorts it is too soon to speak, but R. DISCOLOR, R. CALOPHYTUM, R. OREOTREPHES, R. YUNNANENSE, R. CHARTOPHYLLUM, look well, while R. OREODOXA and R. DECORUM are rather disappointing at present. R. FICTOLACTEUM and R. HÆMATODES have recently been added.

Suggestions as to species suitable for cultivation under these conditions would be welcomed.

JOHN STIRLING-MAXWELL.

October, 1920.

RHODODENDRONS AND SHADE.

There is apt to be confusion between the two terms "shelter" and "shade." It is quite unnecessary to point out to growers of Rhododendrons how essential shelter is for the welfare of these plants. Strong winds twist the petioles, especially of the larger leaved species, and although no immediate damage is apparent, in a short time the leaves hang down, turn yellow, and eventually drop off. I am now convinced that shade has also an important influence on the vigour of Rhododendrons, and on the colour of the flowers.

My attention was first drawn to this point by some plants of R. AUGUSTINII. Though in a sheltered spot they got a considerable amount of sun from noon to 3 p.m. Two plants were moved to a very shady position, and the following year the effect was seen. The leaves were larger, and the colour of the flowers much more attractive in the plants which were moved.

The second year the improvement was even more marked. This is not a case of mere varietal forms, as when growing together there was scarcely any perceptible difference in the colour of the flowers on any of the plants.

Having had my attention thus drawn to this matter I made notes and observations in several gardens on species of Rhododendrons, such as R. FALCONERI, R. BARBATUM, R. FULGENS, R. CAMPANULATUM, and I found that in almost every instance, and quite independent of shelter, the plants grown in shade had larger and healthier foliage, and, to my eye, the colour of the flowers was more intense. I am not prepared to say that this applies to all localities, but certainly it seemed to be the rule in all the gardens visited by me in Ireland.

I would like to add a word in favour of R. AUGUSTINII. It is one of the most distinct and beautiful of all the Chinese species, and apparently a good doer in very diverse soils and situations. The colour of the flowers is soft and beautiful, and quite distinct from that of any other Rhododendron of its size and habit, the only species approaching it being some of the diminutive Intricatum group.

F. W. MOORE.

December, 1919.

RHODODENDRON AUSTRALE AND OTHER NOTES.

In early May of this year there flowered here for the first time plants grown from seed received under number 9341 of Forrest. On sending specimen flowers and foliage to Sir Isaac Balfour, he informed me that he had no record of the plant having previously flowered in the British Isles, and that he considered I was justified in calling my plants R. AUSTRALE, although there were certain minute differences between this species and its near ally R. LEPTOTHRIUM, which would require careful examination when the latter came to flower.

R. AUSTRALE belongs to the ovatum series and is the Northern representative of R. LEPTOTHRIUM in Eastern Yunnan. It was collected by Forrest, in fruit only, on the Western flank of the Shweli-Salwun Divide, and was originally believed to be R. VIALII, but subsequent investigation has shown it to be distinct from that species, and one of the Ovatum series. In view of the fact that a full description of this species will appear in the forthcoming number of Notes from the Royal Botanic Gardens, Edinburgh, I will only here add a brief note as to my experience of the plant from a cultural point of view. There is also a reference to it on page 86 of the R.B.G. Edinburgh Notes of January.

The plants which flowered here this season (1919) are growing in an exceptionally well-sheltered site in the rock garden at the base of a bold rock-face in partial shade, and have developed into vigorous, bushy specimens 2-3 feet high, whose rose-pink flowers and bronze-green foliage make a most attractive display.

In other and more exposed positions growth has been slow and stunted, and there has so far been no sign of flower. Experience here leads me to the opinion that in our climate the plant needs, and well deserves, a carefully chosen site, cool and sheltered from wind, and is ill-adapted to taking its chance in comparatively exposed places.

Apart from *Eucryphia pinnatifolia*, a plant of exceptional beauty here, the most attractive September flowering shrub has been *Hoheria populnea lanceolata*. A lawn specimen nine feet high by five feet through, perfect in symmetry, bearing a mass of delicate white flowers and presenting an autumn picture for which one cannot be too grateful. This would seem to be a far hardier plant than is generally supposed, and is certainly a more free-flowering subject than the typical species—a strong specimen of which was two winters ago killed outright by frost, though growing on a warm wall.

In cold districts where this variety might not succeed in the open it well deserves the protection of a sunny wall, where, in association with such as *Eupatorium Weinmannianum*, *Escallouia montevidensis*, *Ceanothus indigo* and *Caryopteris mastacanthus*, an attractive floral display may be obtained at a season of the year when it rightly meets with high appreciation.

H. ARMYTAGE MOORE.

September, 1920.

NOTES ON MY GARDEN AT EXBURY.

As it is the duty of Members of the Rhododendron Society to contribute notes each year on Rhododendrons, and as I unfortunately have not the training to write scientific articles, it would perhaps be most interesting to Members of the Society if I were to describe the successes and failures I have from year to year in my woods at Exbury.

As climate and soil play so important a part I will preface my remarks with a short description of these as I find them at Exbury. With regard to the situation, Exbury lies at the mouth of the Beaulieu River, and thus benefits by the Gulf Stream, which comes up the Solent. The woods where my Rhododendrons are planted stretch from a point on the river about one mile from the sea inland about two miles to the North. Geologically speaking, I believe the soil is described as " peat mud," but actually it is extremely variable, being at the bottom a thin layer of loam on top of blue clay, running through a deep vein of very stony soil on top of gravel to a vein of pure Bagshot sand. Of course in the Oak woods there is a good deposit of peaty leaf mould over what I have described and the Rhododendrons seem to thrive in it. Drought is my worst enemy, as along the Solent there is a little strip of country where it never seems to rain in the summer months. The hills of the Isle of Wight draw off the thunder clouds to the South and the heavy trees of the New Forest draw away the rain northwards. I have frequently seen it raining over the Isle of Wight and have driven through heavy rain from Southampton to Beaulieu rejoicing in the shower that was to benefit my garden only to find dust-dry roads two miles from my house. Fortunately with a good supply of springs in my woods and with a portable oil engine and pump, it is possible to make good the deficiency of rain in the case of the rarer Rhododendrons. This year, however, there has been no necessity for the engine and the growth has been marvellous.

Exbury was only acquired by me in 1918, and work was started in the Home Wood in the autumn of 1919, the few rarer Rhododendrons collected up till then being huddled together in a little nursery. The Home Wood which runs from the house to the river, a distance of about half-a-mile, is composed of oak and fir with formerly a thick undergrowth of hazel and sycamore suckers. The latter we grubbed up and we cut down a number of the smaller and badly-grown oaks and firs, leaving drifts in which the rhododendrons could be planted. These were well trenched and where the soil was very gravelly a little peaty leaf soil from one of the neighbouring woods was dug in. In all cases a little of the leaf soil was put round the Rhododendrons and Azaleas when planted. So far about 10 acres have been treated, roughly a third of the distance down, but of course not nearly so much ground was available for planting.

The outside and more exposed places have been planted with some of the hardy hybrids purchased from the two Waterers, while in the inside are some of the choicer tender hybrids and plants acquired from Gill, Veitch, Reuthe,

Smith of Guernsey, White and Van Nes, and thanks to the generosity of Captain Tremayne and Mr. J. C. Williams, of Cærhays (especially the latter), some of the choicest of Rhododendrons occupy the place of honour.

Failures there are sure to be, but so far, owing to the great care taken in planting by my Head Gardener who used to be at Leonardslee, but few plants have been lost ; out of some thousands those that have died can be counted on the fingers of one hand. This year of course was an unusually favourable one, and as there has been no frost since early in March, even the most precocious growths, with one or two exceptions, have escaped—one FORTUNEI hybrid and some of the buds of AUCKLANDII being the only ones pinched.

Among the Rhododendrons which flowered exceptionally well this year may be included AUGUSTINII, LANATUM (very freely), "GRIFFITHII"* (from Smith, of Guernsey), and the Gill and Van Nes hybrids.

Rhododendron seeds from Mr. Farrer's 1919 Expedition have germinated well, and there has only been one complete failure ; the seedlings are now being pricked out in boxes and frames.

A flower of AURICULATUM was received from Cærhays last year and the pollen was put on to DISCOLOR and one or two hardy hybrids still in flower. Seeds from these have germinated, as also from crosses made between DISCOLOR and a few late flowering garden varieties.

This year a plant of DISCOLOR was taken up, put in a tub in the Vinery and brought into flower early in May, and between 20 and 30 crosses made between it, and every variety of Rhododendron in flower in my garden at the time ; most of the seed pods are now swelling well. NERIIFLORUM has also been used as the male parent, but apparently with less success.

Work is now in progress for extending the planting in the winter, as some of the plants are rather crowded and growing fast, and some are not in the best situations. Especially is this the case in regard to the large-leaved species, CALOPHYTUM, EXIMEUM, FALCONERI, FICTOLACTEUM, HODGSONII, etc., etc., which were planted in semi-shade, but unfortunately a large tree had to be cut down and they now receive all the afternoon sun. They will be moved lower down the Wood to a shadier and moister place.

LIONEL DE ROTHSCHILD.

September, 1920.

* Griffithianum x Fortunei. See "*Rhododendrons*" by J. G. Millais, p. 176. C.C.E.

A FEW NOTES ON PLANTS AT CASTLEWELLAN, IRELAND.

Among the gardens of Ireland celebrated for the rare plants they contain, Castlewellan has long and justly been reputed to be one of the most interesting. Situated on the northern lower spurs of the Mourne Mountains, in County Down, and surrounded by magnificent scenery, it enjoys a mild climate, is well sheltered, is favoured with a good soil, and is specially adapted to the successful cultivation of exotic trees and shrubs. The collection there, as is well known, was made mainly by the father of the late Lord Annesley, who was an enthusiastic and energetic horticulturist of no small merit as well as an ardent lover of nature, and who spent his leisure time for more than thirty years of his life in adding, by careful and judicious planting, to the natural beauties of his home. He died in 1908; and since then many new plants have been obtained, but not perhaps in the same systematic way as during his lifetime; and so the collection though complete up to that date, does not include some of the more recent importations that have come to this country from China and the Far East, through the fruitful exertions of Messrs. Wilson, Forrest, and other explorers. On the other hand, the existing plants, always thoroughly well cared for, have had time to grow and develop, and to show themselves off to the best advantage. And this they certainly do, forming many groups of stately trees and of large shrubs, all thriving in health and in great luxuriance.

Of Rhododendrons, there are a few of the earlier introductions from China, such as R. AUGUSTINII, R. HANCEANUM, R. LUTESCENS, R. POLYLEPIS, R. YUNNANENSE, etc. The Himalayan section however is thoroughly well represented, and fine specimens are to be seen of: R. BARBATUM, a clump of which nearly 12 feet high, covers a space of some 22 yards round; R. FALCONERI 20 feet, R. THOMSONII 18 feet, R. CAMPANULATUM, R. EXIMIUM, R. FULGENS, R. NIVEUM, and others too numerous to mention. There are plenty of the newest and best hybrids through the grounds. But the gem of this important genus is to be found in a form of R. ARBOREUM with red flowers, which seems to have been extensively planted in Ireland during the early part of the last century. One of these at Castlewellan is the largest I have ever seen, being as far as I could estimate it, nearly 40 feet, high densely clothed with leaves down to the ground, and embracing an area 70 yards round. It is not a rare kind; but this magnificent specimen is remarkable for its size and vigour, and for its striking beauty when in full bloom in the spring of the year. There is no record as to when it was planted, but it is long remembered apparently as large as it now is; it is probably one of the oldest in the country.

It would be hardly possible in these short notes to go fully into the many plants that adorn Castlewellan; but it may interest the members of the Rhododendron Society if I mention just one or two of them. *Eucryphia pinnatifolia* and *E. cordifolia* are both flourishing there, the latter perhaps somewhat more vigorously than the former; but there are also some bushes

of *E. pinnatifolia flore pleno*, which I have not seen elsewhere, and which is a very pleasing and interesting variation of the type. *Lomatia ferruginea* is nearly 30 feet high and blooms freely. *Nothofagus fusca* is becoming a large tree and is growing remarkably well. *Olearia virgata* forms quite a conspicuous object with its thin grey feathery foliage; and there are large specimens of *Pittosporum nigrescens* which also add a grey-green colour to the landscape; the effect is moreover improved by the immense leaves of the true *Cordyline indivisa*, of which there are several well-grown plants, one having flowered this season. *Myrtus Luma* from Chile thrives luxuriantly densely clothed in dark green and covered in autumn with white flowers; *Berberis nepalensis* is growing vigorously and is doing much better than it does with me at Rostrevor. I may add to this list *Cercidiphyllum japonicum*, *Carpodetus serratus*, *Desfontainea spinosa*, *Euonymus pendulus*, *Hamamelis mollis*, *Hoheria populnea*, *Mitraira coccinea*, *Parrotia persica*, *Stuartia virginica*, *Tricuspidaria lanceolata*, *T. dependens*, *Viburnum rhytidophyllum*, and many others, which are all to be seen in great profusion and vigour, and which present a truly fine spectacle of exotic flora. Of conifers, *Juniperus recurva* is the largest I have seen anywhere, some 40 feet in height, feathering to the ground and forming a circle 40 yards in circumference; *Dacrydium Franklinii* 20 to 25 feet high, *Pinus Montezumae*, *Podocarpus chilina*, *Prumnopitys elegans*, and *Pseudolarix Kaempferi*. This last species not more than 15 feet high, has spread itself out as a sort of trailer and covers an area from 10 to 12 yards in length by the same in breadth; there is another specimen in the grounds nearly as large.

This meagre description, omitting many details and taking no note of numerous other species to be found flourishing at Castlewellan, gives I am afraid very little idea of the real merits of the collection. But it may perhaps serve to remind those who have seen it in the past that it still holds its own in Ireland, and that it is increasing in interest by the steady development which year by year is going on among the rare and beautiful plants introduced into that place.

JOHN ROSS OF BLADENSBURG.

Rostrevor House,
Co. Down, Ireland.

EFFECTS OF DROUGHT AT ROSTREVOR.

Ireland is credited with having a wet climate, and as a rule we seldom fail for lack of moisture ; but occasionally, though rarely, we suffer from drought, and during the past summer (1919) we had very little rain in the district in which Rostrevor is situated. I never remember such a dearth of water, nor an absolutely dry season so long protracted in this neighbourhood. On account of it, we had practically no flower at all in August ; for instance, *Eucryphia pinnatifolia* and *E. Billardieri* which are always smothered in bloom in that month, made no display whatsoever, though otherwise they were quite untouched by the unusual weather ; the flower buds just shrivelled up as they attempted to open, and there was no colour to be seen beyond the green foliage. Many of the plants in this place are growing on sloping ground, and I fully expected that a large proportion of them might be injured by the abnormal conditions that then prevailed ; but such happily was not the case.

None of the Rhododendrons were damaged, probably because most of tham had made their growth before the drought began ; but while it lasted some of them curled up their leaves like twisted ropes, and seemed to be in a wretched plight. By watering as many as possible and by covering the ground near the roots with hay or straw, they all managed to survive, and they now appear to be none the worse for what they went through. R. EXIMIUM however, which only begins to make its young growth late in July was more affected,—though the leaves did not appear to flag,—in that, it did not attempt to move until about the middle of September ; it seems still very backward and the year's push is very small and not nearly as well developed as usual. Except for this, it appears to be in a normal condition and well budded for flower in 1920. In October we had a compensation by an unusual display of bloom on nearly all the bushes of R. ANTHOPOGON and R. "PRÆCOX" that are growing here, not a mere small show of a few flowers here and there on each plant, but quite as good a one and as luxuriant as if it had been the spring of the year. It remains to be seen whether they will do this again next spring, and thus give three blooming periods in twelve months. There is not much else to report, except that some of the winter Rhododendrons, such as R. "NOBLEANUM," instead of waiting until Christmas time to expand their trusses, are beginning to do so now in the autumn, while *Eucryphia Billardieri* has been flowering intermittently for some weeks, ever since rain has moistened the soil.

Leaving out of account some minor losses due to drought, I should mention that *Dacrydium Franklinii* was badly damaged. There are two specimens growing here, one some eleven feet high and nearly as much through, the other smaller. Both are planted on sloping ground, and both are injured ; but nothing else near them seemed to be in the least degree touched by the dry season. While these unusual conditions continued, neither showed signs of distress ; they remained green and in appearance flourishing like their neighbours ; they

were not therefore watered nor was the ground near the roots mulched with straw. There was sufficient to do to attend to those plants that were visibly gasping for water. But when at last some rain began to fall, then these two conifers showed that they ought to have been specially looked after, for then they immediately began to droop and to wither. Neither of them is killed and both are likely to recover; but it is feared that the larger one will be worthless as a specimen plant. I thought at first that this might be due to a possible subsoil of porous gravel just under these plants; but as both have suffered though placed in very different situations and some few hundreds of yards apart, it may be perhaps that the species is more susceptible to drought than is generally supposed, and the note I submit may be useful to others.

JOHN ROSS OF BLADENSBURG.

Rostrevor House,
Co. Down.

HYBRIDIZATION.
THE ELIMINATION OF FOREIGN INTERFERENCE.

The object of the following experiment is to find a method of cross fertilizing a flower by which the possibility of other pollen being introduced to the stigma is eliminated.

The procedure is the emasculation of the flower and the entire removal of the floral envelope at an early stage. This operation should be performed when the floral envelope is only half developed. The stigma is then unreceptive, and will not be in a condition to receive pollen for three or five days.

In the second week of June, 1919, 200 blooms of MAXIMUM were so treated. During the following days 25 stigmas were treated with pollen from R. "G. A. SIMS"; 50 with pollen from R. PONTICUM; 25 with pollen from R. MAXIMUM; and 100 were left untreated.

In December seed was collected from 19 pods of the "G. A. SIMS" Cross (6 failing to set seed); 41 pods of the PONTICUM Cross (one truss of 5 blooms lost, 4 failing to set seed); 22 pods of the MAXIMUM Cross (3 failing to set seed). This seed was sown in March, 1920, and all germinated.

Of the 100 flowers that were not artificially treated with pollen, not one had a seed pod.

Three trusses, on a bush well covered with blooms, were kept under observation for three consecutive sunny days—eleven hours in all—and although there were numerous Humble bees at work, no bee visited a defoliated flower.

In June, 1920, similar operations were carried out on PONTICUM blooms. 200 flowers were treated. Of these, 50 were fertilized with pollen from any flower adjacent (43 of which set seed vessels); 150 were left unfertilized—not one of which had a seed vessel in November.

This operation on the flower can be carried out in the early stages of flower development with reasonable chances of success.

On June 5th, 15 blooms were so treated when they were only just showing colour. The average length of the pistils on the 5th was $\frac{3}{8}$ in.; on the 12th was $\frac{1}{2}$ in.; on the 19th was 1 in.

These 15 pistils were fertilized on the 19th, which was the first day the pistils were receptive. Of these, 7 set seed.

It is obviously unnecessary to take flowers in such an early stage of development, but this shows that, with flowers half developed, there is little risk in checking the growth of the ovary.

Conclusion. That flowers so treated will not set seed, but if flowers, having been so treated, are fertilized, and set seed, the seed borne is the result only of the pollen introduced.

E. H. WILDING.

December, 1920.

NOTES UPON THE LAPPONICUM GROUP.

Mr. Eley has asked me to write something on the Lapponicum group of Rhododendrons. This is not an easy task, for I have seen just enough of a few of them to know that it requires much time and close watching for some years yet, before we can learn what their relative values are in the garden.

I am giving some few details of what I think of those which have been flowering here for several seasons. Of others, which are younger, it is impossible to say anything for the present, that is as regards their horticultural value; for most members of the Society will be acquainted with the ample information and most instructive botanical details, which Professor Sir Isaac Bayley Balfour has given us in various numbers of the Edinburgh Notes.

Possibly gardeners most want to know certain simple points, looking it may be for details as to colour, height, vigour, and general adaptability. As far as my very limited experience goes, I will try and help in that way.

CHRYSEUM. It has been flowering here for three or four years. It has a pale yellow flower, as I know it, and so far is not so good as PRIMULINUM. But other forms of it are growing, and it seems likely that 13947 will be brighter in colour.

CUNEATUM. This is a far larger plant than most of the set, and seems to grow well anywhere. It may reach five or six feet, but the colour is not so attractive as in others of the series. It reminds me in the foliage rather of RUBIGINOSUM than of most of the Lapponicums I know, but RUSSATUM comes midway between it and the others in foliage.

FASTIGIATUM. As we know it from the 1911 collection, it is a dwarf, very close-growing plant, with a considerable range in the lavender blue colours, some forms of which are quite fine.

HIPPOPHÆOIDES. This is a fine free plant in good cool soil, particularly if it turns away from the sun, and is on a bank looking rather to the north of east. I think Mr. Forrest says it is a bog plant. The forms of pale lavender blue to be found amongst the seedlings are the best things on those lines I see in this family.

IDONEUM. Is a nice refined plant, rather on the small side in the foliage and flower, but I have not yet seen enough of it to be sure of its best, or of its worst, points.

IMPEDITUM. With us, is a close-growing almost prostrate little shrub, and its best forms are very beautiful in colour. From one of the better dark forms, crossed with AUGUSTINII, we have raised very nice hybrids.

INTRICATUM. Every member of the Society will know it well. I have never had more than one form of it, and that was off a plant which figured in "The Gardener's Chronicle" many years ago, and it is a good form. I believe those

who had the enterprise to raise it from seed would almost certainly get better varieties. It is a very good thing.

PRIMULINUM. Will reach over four feet high on a favourable soil and site. It is a very charming plant, and the name just indicates its colour when at its best.

RUPICOLUM. Is not, perhaps, everyone's colour, but it is a robust plant when well grown, and apart from other colours, is quite attractive.

SCINTILLANS. On the whole, if I had to begin again, and only to have one of these species, I should choose this, i.e., if I could raise plenty of it from seed. Most of the forms are good, but the best of the dark blue lavender forms are to me the best in the family, but not so the light coloured ones.

VERRUCULOSUM. This is not attractive in the old bushes which we have here. It lacks form in the plant and good colour in the flowers, but I have only three plants.

WEBSTERIANUM. A plant with a loose habit, and rather tall. The flowers are larger than in most of this family, but it is not as good as some of the others, as far as I have seen it.

I believe all of this series need cool moist soil, and no shade, but in this part of the country to be on the side of a hill away from the sun. I have known great losses from their being dry and hot, but from no other cause, excepting when rabbits get to them. Rabbits take them as a personal offence.

J. C. WILLIAMS.

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