## THE RHODODENDRON HANDBOOK 1947

CONTAINING THE LIST OF species with descriptions and synonyms, together with list of hybrid Rhododendrons and Azaleas, list of collectors' numbers and the Rhododendron Stud Book formerly published in the Rhododendron Association's Year Book. This book has been completely revised by a sub-committee of the Rhododendron Group and contains their valuation of each species and hybrid.

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*There are a few copies still left of the 1947 and 1948 Year Books, price 8s. 6d. each. The first impression of the 1946 Year Books is completely sold, but there are still a few copies of the second impression, price 7s. 6d., while there are a few copies of pre-war Year Books still available, price 5s. paper covers, 6s. cloth bound, postage and packing 9d.*

# R.H.S. PUBLICATIONS
## 1949 YEAR BOOKS

### *FRUIT YEAR BOOK*

A SPECIAL FEATURE OF THIS BOOK is two articles on Fruit Growing in Scotland—Apples and Pears, by Mr. D. L. Storrie, and Soft Fruits, by Mr. R. Reid—which should be a great help to all fruit growers in Scotland. The volume is dedicated to Mr. Edward A. L. Laxton, V.M.H., and contains an appreciation of his work by Mr. M. B. Crane, F.R.S., who also contributes an interesting article on The Origin of the Garden Plum. There are authoritative and most useful articles on Sprays and Spray Machinery, on grafting and on pruning systems, and on cultural methods, as well as discussions on Plums and on Cherries. Mr. Barrington Brock describes the results up to date from his experimental vineyards in Surrey. Overseas fruit growing is represented by articles from South Africa, British Columbia, New Zealand, and Victoria, Australia. The book is lavishly illustrated and should be as useful as its two predecessors for 1947 and 1948.

### *DAFFODIL AND TULIP YEAR BOOK*

THIS NUMBER OF THE DAFFODIL AND TULIP YEAR BOOK contains many important articles on aspects of Daffodil growing and breeding in many countries. It contains a full account of the Daffodil Shows for 1949, both in this country and overseas, together with a list of new Daffodils registered in 1949 as well as those which have received awards. A particular section has been devoted to the subject of Daffodil breeding and contains articles by Dr. Janaki Ammal, the Cytologist of the Society at Wisley, and Miss Ann Wyllie of the John Innes Horticultural Institution, and Mr. Cyril Coleman. Professor Sydney Mitchell contributes a most interesting article on the arrangement of the Daffodil border in his garden in California and Mr. Herbert R. Barr deals with the Change of Taste in Daffodils, while Mr. Guy Wilson writes of his Memories of the 1949 Daffodil Season. There is also a further continuation of the important work on Climate and Storage Influence on Bulb Flowering, by H. W. Abbiss and S. P. Craze. The book is dedicated to the Rev. Joseph Jacob about whom Mr. E. A. Bowles writes. In the Daffodil Ballot will be found again recommended selections of most suitable Daffodils for growing both in bowls and in the open for exhibition and for house decoration.

### *LILY YEAR BOOK*

THIS BOOK CONTAINS interesting articles on Lilies at Delmonden Manor, by Dr. Amsler, Lilies at Wisley, by Mr. F. Hanger; the Propagation of Lilies is described by Miss E. K. Field, while Mr. W. A. Constable deals with Lilies for the Beginner. The book is dedicated to Mr. R. W. Wallace, V.M.H. Authoritative accounts of *Lilium Davidi* and *L. Davidi* var. *Willmottiae*, by Mr. A. D. Cotton, O.B.E., F.L.S., V.M.H., from the Supplement to Elwes' Monograph, continues our reprints from that work. Mr. H. F. Comber contributes an important article on a New Classification of Lilies. A special section on Lilies in New Zealand, where unusual success seems to have been obtained, is also included. The book also contains a number of Lily Notes, together with an account of the Awards to Lilies and Lily exhibitions in the year and Lily literature.

*Cloth Bound* 8s. 6d. *each*

R.H.S. RHODODENDRON YEAR BOOK 1949

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# THE RHODODENDRON YEAR BOOK

*Conference Number*

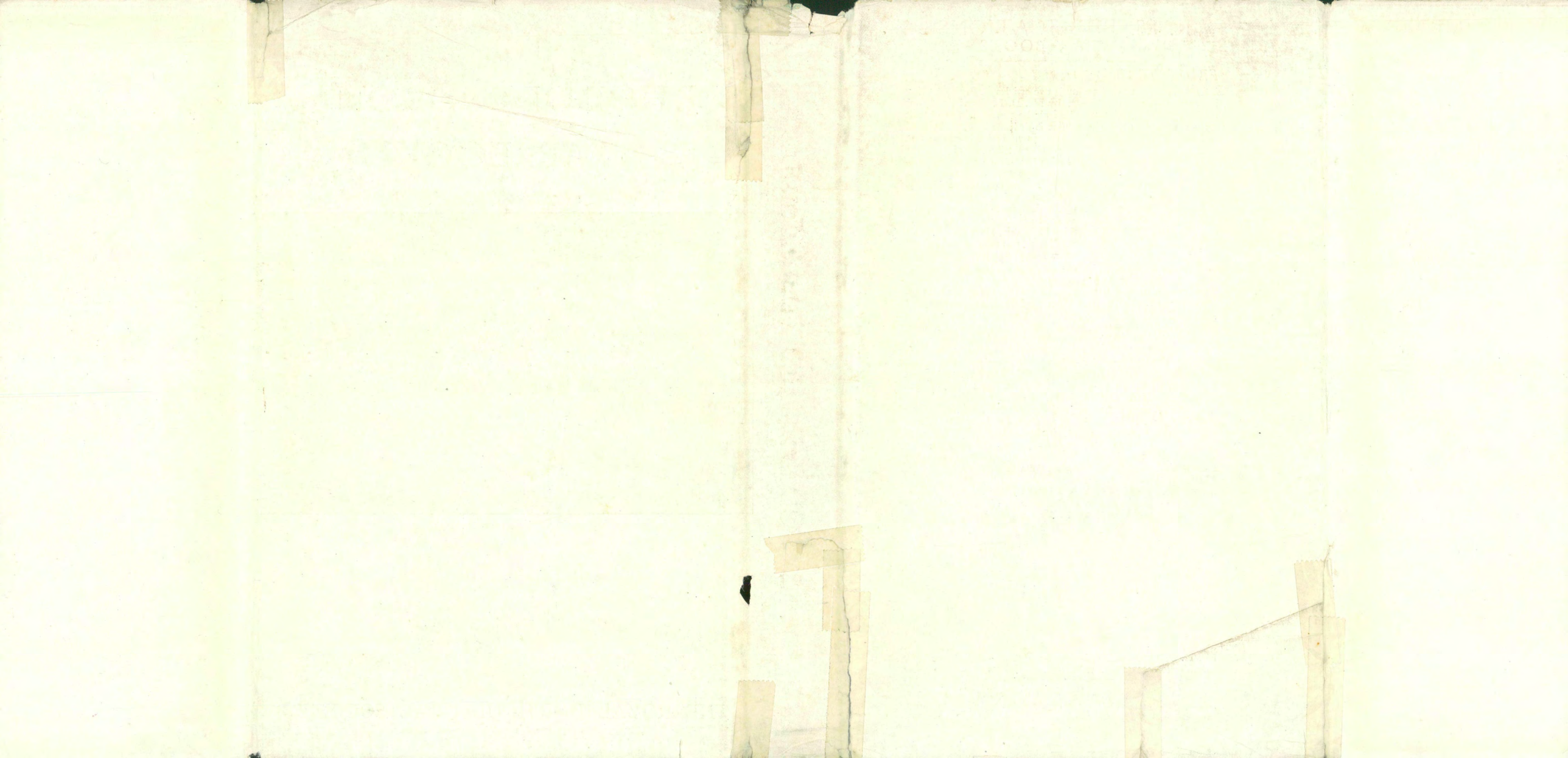
1949

THE ROYAL HORTICULTURAL SOCIETY

THIS CONTAINS the important papers read to the Rhododendron Conference, prepared by Captain F. Kingdon-Ward, V.M.H., Lord Aberconway, C.B.E., LL.D., V.M.H., Dr. J. Macqueen Cowan, Mr. F. Hanger, Mr. F. J. Rose, V.M.H., and Mr. O. C. A. Slocock, together with the discussions which followed the papers. There is also an account of Rhododendrons at Caerhays Castle, Cornwall, by Mr. Charles Williams, M.P. Dr. J. Macqueen Cowan and H. H. Davidian of Edinburgh Botanic Garden continue the important revision of the Series of Rhododendron with the discussion of the Campanulatum and Fulvum Series. There are also accounts of the Rhododendron Show and Rhododendron Tour and Awards to Rhododendrons given during 1949.

COVER ILLUSTRATION
Rhododendron 'Elizabeth'
**F.C.C.**
*Colour photograph by*
J. H. DOWNWARD

**8s. 6d.**



# Acknowledgements

## to this online edition

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*Colour transparency, J. E. Downward*

RHODODENDRON 'ELIZABETH,' F.C.C. (See p. 6)

# THE RHODODENDRON YEAR BOOK 1949

*NUMBER FOUR*

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THE ROYAL HORTICULTURAL SOCIETY
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# FOREWORD

THE present issue of *The Rhododendron Year Book* should be of especial interest since the Rhododendron Conference, arranged by the Society, took place this year and this is a special Conference number of the Year Book which includes all the papers read at the Conference as well as an account of the special show and the tour of some of the finest Rhododendron gardens in the South and West of the Country.

The Conference attracted many Rhododendron friends from abroad—notably from the North-West coast of the United States and Canada.

Although those growing Rhododendrons in that area could not, of course, exhibit at our show, their knowledge of Rhododendrons and the accounts that they gave of their gardens showed that they are displaying great energy in Rhododendron cultivation and, helped as they are by a mild and moist climate, they should make it a wonderful place for the growing of Himalayan and Chinese Rhododendrons.

The Rhododendron Show itself had not, of course, the number of amateur groups that used to be shown before the war. The trade groups, however, were excellent and of much interest.

The cut flowers, also, favoured by good weather reached a high level of beauty and of interest.

It is true that post-war conditions have cut down the work of hybridization, and many Rhododendron gardens are full to overflowing as plants increase in size and seedlings are planted out. So much so, that in a garden of more than average size, I can spend most of a morning looking for a site for one more Rhododendron that has displayed an unexpected merit in one's nursery bed. Still, there will be for some years enough new pre-war hybrids to satisfy the seekers after novelties.

Those whose gardens were favoured with a visit from the friends who participated in the Society's organized tour, were, I know, pleased and proud to show their gardens and their growing plants to those who visited them.

One of those gardens, that at Caerhays in Cornwall, is dealt with in a special article in this issue of *The Rhododendron Year Book*.

It was planted, as we all know, by JOHN CHARLES WILLIAMS, a great plant lover of discriminating taste. He collected plants from distant regions, and favoured by a wonderful climate, he gathered together a unique collection of Rhododendron species, Magnolias, Camellias and other rare trees and shrubs—a collection admirably cared for by the present owner.

One only regrets when one sees that garden that a number of the plants can only be grown in our country in the mildest parts.

Among the Rhododendrons, and going well with them at Caerhays, are very many fine and rare Magnolia species, together with Camellias *reticulata*, *saluenensis* and that admirable hybrid of *C. saluenensis* and *C. japonica*, made at Caerhays and now known under the name of C. 'Williamsii', a hardy shrub, and probably one of the best shrubs ever introduced to our gardens.

Again in the Year Book, on the scientific side, DR. COWAN and MR. DAVIDIAN are unravelling two other series of Rhododendrons in a most interesting article of great scientific importance.

It is fortunate that men of such botanical eminence are helping us with Rhododendrons, although we are inclined to scan their articles with trepidation lest familiar names be superseded by others at the bidding of authorities whose names needs must compel obedience.

ABERCONWAY

## *RHODODENDRON 'ELIZABETH,' F.C.C.*

LORD ABERCONWAY, C.B.E., LL.D., V.M.H.

This hybrid between *Rhododendron repens* and *R. Griersonianum* has developed one quality in which neither parent is outstanding, namely, the extreme freedom with which it produces its flowers.

The **F.C.C.** plant which has an exposed area of about 5 feet 6 inches by 9 feet, has more flower buds on it this summer than I personally have ever before seen on a similar area of any Rhododendron. Of 526 shoots carrying flower buds, 83 carry more than one, and of these latter 4 carry seven and 14 carry six buds each, with many twos, threes, fours and fives.

Of course, the plant has had an unusual amount of sunshine this summer, but it has had a sufficiency of water from the hose, and is in rude health, so that the abundance of flower is not a sign of weakness.

The buds on the head are produced, one as a terminal bud, and it then has a number of axillary buds which come from the axils of the leaves quite close to the terminal buds, making one continuous group of buds. (Frontispiece and Fig. 2.)

R. 'Elizabeth' has the pre-potent habit of *R. repens* of growing sideways where possible rather than upright, thus maintaining its pleasant dwarf habit and very close growth.

The colour of the flowers is an excellent combination of the flower colour of both parents, and is of a startling red.

It inherits neither the slight tenderness of *R. Griersonianum* nor the fastidiousness of *R. repens*.

# THE RHODODENDRON CONFERENCE, 1949

THE Council of the Royal Horticultural Society decided to hold the Rhododendron Conference, originally planned for 1940 but postponed owing to the war, on April 26 and 27, 1949.

On each of these days Rhododendron experts gave Papers in the Lecture Room of the Society's New Hall, Greycoat Street, particulars of which are given below. A two-day Show was held concurrently with the Conference, in which displays of Rhododendrons were a special feature and at which there was an exhibit of Rhododendron literature. A special report of the Rhododendron Show which filled the Old Hall is given later in this book.

On April 28, 29 and 30 there were day excursions to outstanding Rhododendron Gardens in the vicinity of London and to the Society's Gardens at Wisley; and a ten-day tour by motor coach was arranged, starting on May 1 and visiting Rhododendron gardens in England and Wales. A dinner was held in the Restaurant of the New Hall on the evening of April 26 and after dinner brief speeches were made by LORD ABERCONWAY, C.B.E., LL.D., V.M.H., the Chairman and MR. JOHN HENNY, President of the American Rhododendron Society.

## PAPERS GIVEN AT THE CONFERENCE

*Tuesday, April* 26, 1949

2.30 P.M. "Rhododendrons in the Wild" by CAPT. F. KINGDON-WARD, V.M.H. *Chairman:* The President, LORD ABERCONWAY, C.B.E., LL.D., V.M.H.

*followed by—*

"Rhododendrons in the Garden" by LORD ABERCONWAY, C.B.E., LL.D., V.M.H. *Chairman:* SIR WILLIAM WRIGHT SMITH, F.R.S., V.M.H.

*Wednesday, April* 27, 1949

10.30 A.M. "Survey of the genus Rhododendron" by DR. J. MACQUEEN COWAN of the Royal Botanic Garden, Edinburgh.

*followed by—*

"Propagation of Rhododendrons" by MR. F. E. W. HANGER, Curator, R.H.S. Gardens, Wisley. *Chairman:* SIR EDWARD SALISBURY, F.R.S.

2.30 P.M. "Modern Hybrid Rhododendrons" by MR. F. J. ROSE, V.M.H.

*followed by—*

"Hardy Hybrid Rhododendrons grown Commercially" by

MR. O. C. A. SLOCOCK. *Chairman:* COLONEL THE LORD DIGBY, D.S.O., M.C., T.D.

## DAY EXCURSIONS

THURSDAY, APRIL 28 Visit to Tower Court, Ascot (property of J. B. STEVENSON, ESQ., V.M.H.)

FRIDAY, APRIL 29 Visit to Wakehurst Place, Ardingly, Sussex (property of SIR HENRY PRICE) . . . and to Leonardslee, Horsham, Sussex (property of SIR GILES LODER, BT.)

SATURDAY, APRIL 30 Visit to The Royal Horticultural Society's Gardens, Wisley, Surrey

## TEN-DAY TOUR BY MOTOR COACH VISITING BRITISH RHODODENDRON GARDENS

*Approx. mileage*

SUNDAY, MAY 1 London — Guildford — Winchester — Southampton (Visit to Exbury House, property of EDMUND DE ROTHSCHILD, ESQ.)—Bournemouth 120

MONDAY, MAY 2 Bournemouth — Dorchester (Visit to Minterne, Cerne Abbas, property of COLONEL THE LORD DIGBY, D.S.O., M.C., T.D.)—Exeter—Torquay 106

TUESDAY, MAY 3 Torquay — Plymouth — St. Austell (Visit to Caerhays Castle, property of C. WILLIAMS, ESQ., M.P.)—Truro—Falmouth 100

WEDNESDAY, MAY 4 and THURSDAY, MAY 5. At Falmouth—Visits to Gardens at: Tregothnan, Truro (property of VISCOUNT FALMOUTH). Trewithen, Grampound Road (property of G. H. JOHNSTONE, ESQ.). Heligan, St. Austell (by courtesy of LT.-COM. H. H. THOMAS). Trengwainton, Penzance (property of LT.-COL. E. H. W. BOLITHO, C.B., D.S.O.). Penzance for lunch and see Land's End. Penjerrick, Falmouth (property of W. R. FOX, ESQ.)

FRIDAY, MAY 6 Falmouth — Bodmin — Okehampton — Exeter—Taunton or Minehead 130

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MONDAY, MAY 9 At Bettws-y-Coed—Visits to Gardens at Bodnant (property of LORD ABERCONWAY, C.B.E., LL.D., V.M.H.) and to Conway Castle

TUESDAY, MAY 10 Return to London 213½

# RHODODENDRONS IN THE WILD*

F. KINGDON-WARD, V.M.H.

(*Paper read in part on April* 26, 1949, *by* MR. P. M. SYNGE *in the absence of the author,* LORD ABERCONWAY, C.B.E., LL.D., V.M.H., *in the Chair*)

IT is not very difficult for the plant collector, after a little experience, to get his eye in, so to speak, for a particular type of plant, so long as it is reasonably abundant. Take Rhododendron, for example. By the time he knows forty or fifty species in and out of flower, he should be able to pick out the genus almost unconsciously, while ignoring almost any plant which is *not* a Rhododendron. Occasionally, no doubt, he will be deceived—I remember being nicely 'had' over *Daphniphyllum himalayense* in Tibet, which in winter foliage looked exactly like a particularly desirable type of Rhododendron—but he will pass by few of the genuine article without instinctively pulling up short. Of course, if a Rhododendron happens to be in flower—and the great majority flower between early spring and midsummer—it is hardly possible to ignore it. But even when out of flower, Rhododendrons possess the hall mark of the aristocrat which, though difficult to define, is sensed at a glance. Indeed, few even of the largest genera of plants display so great a variety of form under a universal hall mark of excellence.

It would be absurd to pretend that dwarf alpine Rhododendrons share anything very obviously with tree species of the forest, either in foliage or flower. But leaving alpines aside for the moment, the tree and shrub species have a certain common denominator, which is unmistakable to the expert. The poise of their leaves; their smooth, pale trunks (innocent of all alien vegetation, even moss, in a region where most trees are habitually plastered with moss and tangled with creepers); their angular gnarled branches, cunningly arranged so as to give the tree a shapely and regular outline—these may be some of the details which combine to help one recognize a Rhododendron in the Himalayan forests. But so great is the variety, they almost defy analysis. The fact that in certain zones Rhododendrons are a majority group of the plant population, is a help; but even in other parts where they form a minority, one can train oneself to notice only Rhododendrons, where, in fact, many other trees and shrubs are equally prominent.

The collector's happiest hunting ground is the Eastern

* Except for comparatively short visits to the China coast, Java, Borneo, the United States of America and Switzerland, my experience of Rhododendrons in the field is confined to Yunnan, Tibet, Assam, Burma and the Himalayas. The following notes therefore refer to these regions.

Himalayan region, with its extension eastwards into China, north-eastwards into Tibet, and south-eastwards into Assam and Burma —a region which may be called Sino-Himalaya. This is the nucleus of the Rhododendron world in Asia. There is a satellite area further east, including the China coast, Korea, and Japan, with a precarious link through the great Chinese divide, where few, if any, species have been discovered, though the Shensi ranges are quite high enough; and another satellite area in the far south, including Malaya and the islands from Sumatra to New Guinea, with a more certain life-line through the Burma-Malay arc. The more isolated eastern satellite area is characterized by an abundance of Azaleas (not very different from some met with in the main region), but the southern area is characterized by a group of Rhododendrons which have no counterpart in Sino-Himalaya. The only links between the tropical and extra-tropical regions seem to be through series 'Maddeni' and 'Stenaulum.' The main concentration lies entirely outside the tropic, in the sub-tropical region (25–35°) of the monsoon belt. But as Rhododendrons are all mountain plants, the latitude gives no idea of the true climate, which is, on the whole, temperate—warm or cool—and alpine. The most important factor in a Rhododendron climate, however, seems to be this: that when the air is warm enough for the plant to grow at all, there is abundant moisture in the air and in the soil; and that when it is too cold for growth, both atmosphere and soil are comparatively dry.

Rhododendrons in the wild are of two types: (i) trees and shrubs in the forest; (ii) 'dwarf' undershrubs in the alpine region. In the forest there are also epiphytic shrubs, which may be more or less dwarf (e.g. *R. megeratum*, *R. vaccinioides*), or quite large shrubs (e.g. *R. Nuttallii*). But there are few epiphytes which will not grow equally well on rocks in the open, where the same conditions of moisture and light can be obtained. They are opportunists, ready to grow on trees if no other site is available. So far as I know, only *R. micromeres* and *R. seinghkuense* are complete epiphytes.

There are several peculiarities about Rhododendrons as a group which are not all immediately obvious, but which dawn on the explorer gradually: (i) the immense variation, even within a single undoubted species; (ii) the entire absence of obvious hybrids; (iii) the localization of species in certain valleys; (iv) their vitality and good health; (v) the sharing of territory by several or many species.

The first point has been stressed of late by the herbarium worker, who has been able to examine critically the large collections made in different, but adjacent, regions during the present

century. It is perhaps less obvious to the explorer, who cannot be acquainted with a species from every locality, and who perhaps finds an extreme form of an already described species. Comparing his plant with the published description, he decides that at least it is not *that* plant, and hence needs a new name. Colour variation in such species as *RR. arizelum, selense, aperantum*, and others is, of course, a commonplace; but other species are more fixed, even in colour, (notably those with blood-red flowers such as *R. Beanianum* and *R. repens*, although *R. cerasinum* is an exception).

The localization of species which, broadly speaking, have a fairly wide range, is curious. It is, of course, an example of discontinuous distribution on a small scale. I once spent an entire season in the Seinghku valley, North Burma, where I found three species of 'Lapponicums,' but never saw a sign of the yellow-flowered *R. chryseum*. Yet at the head of the main Adung valley (into which the Seinghku river flows), not forty miles distant, *R. chryseum* (which is widespread in Western China, sometimes under the name *R. muliense*) is the commonest 'Lapponicum' species. Examples could be multiplied.

The absence of disease, particularly epidemic disease, amongst Rhododendrons which so completely dominate the vegetation, is striking, and will be referred to again. Save for minor ills, they appear to be as near disease proof as any group of living organisms has any right to be.

Finally we observe the communistic equality, and more than communistic toleration, displayed by the great Rhododendron family; and it is this fact that allows those magnificent colour displays which so enchant the explorer. This toleration is especially noticeable on the alpine moorland, where species of the 'Lapponicum,' 'Saluenense' and 'Cephalanthum' type are frequently mixed together, sometimes as many as five or six species in a restricted space. No two plants can occupy exactly the same place, and intensive observation might reveal slight differences of habitat for each species; but on the whole it is unusual for several species of a genus to crowd into a small area. Even alpine Primulas do not mix so readily as Rhododendrons; at least, the different habitats are more clearly defined. An apparent exception is furnished by grasses growing in a meadow; but even here several genera are usually involved. (Figs. 4 and 5.)

One's first sight of a Rhododendron forest in early summer, where the majority of the smaller trees belong to this genus, is unforgettable. Such forest occurs between 9000 and 11,000 feet in the Assam Himalaya, in the Tsangpo Gorge, in the south-eastern quadrant of Tibet, and in North Burma. The big trees

in this zone are, Tsuga, or sometimes Larix and Picea, in the lower strata; Abies—rarely Picea—in the upper. The Rhododendrons occur both scattered and in pure stands, and are not confined to a single species. I remember a marvellous wealth of tree species, including *RR. arboreum, sidereum, magnificum,* and *cinnabarinum* (to mention but a few) in the Assam Himalayas. In places they grew on either side of the narrow ridge, their branches meeting overhead, so that following the ridge one ascended through a sort of pleached Rhododendron walk. They happened that year to be flowering well, and when the thousands of corollas dropped they lay for several days, dappling the path with brilliant colours. One stepped from the deep crimson-scarlet of red-hot cinders into sunny pools of sulphur yellow, apricot and purple, thence back again to blood red.

In the Adung valley, North Burma, *R. arizelum* in shades of ivory, yellow and rose is dominant between 8000 and 9000 feet, clashing at intervals with the jade foliage and amethyst flowers of a more splendid and rarer tree species; while along the river bank *RR. bullatum, crinigerum,* and *vesiculiferum* mingled freely. Higher up, approaching the tree line, *R. selense* in many pastel shades has the bottom of the valley almost to itself, before *R. Beesianum* and *R. niphargum,* the two highest tree species, take over just below the alpine region, when *R. selense* reappears smaller but still in many shades.

No less exciting than the forest aflame with Rhododendrons is the moorland of higher and drier ranges, where one may look across thousands of acres of Rhododendron heath, gleaming with purple and gold, in the thin mountain air. Usually several species (mostly 'Lapponicums') make up the flower foam-crested Rhododendron sea which surges over the Chinese alps; but though the extent of pure Rhododendron is far greater, the number of dwarf species is considerably less than in the mistier alpine regions of Burma-Assam-Tibet. In the Adung valley alone, at least twelve dwarf species cover the rocks towards the Tibetan passes, some choosing open, others more sheltered, positions.

Where rain and mist are everlasting and the snow lies deep and long, there one will seek the greatest concentration and the greatest variety of species. Such a spot is the Doshong La, the last pass over the eastern Himalayas, which cuts across the great hairpin bend of the Tsangpo gorge. Within a few square miles grow some twenty-five species, mostly alpine dwarfs milling together between the rocks, in the gullies, on the cliffs and screes, in early June one of the most colourful and memorable sights of a lifetime. It needs only a flash of sunshine to turn the steep mountain side into a cascade of red-hot lava, from which dart

little white, pink, yellow, or lilac flames. But sunshine on the Doshong La is as rare as nuts in May, especially in June.

I have seldom seen the effect of shelter on the Rhododendron family so clearly marked as here—and shelter in the alpine region means no more than that in the shadow of a cliff the snow lies longer in spring, melting more gradually. Yet it is enough to turn the whole Rhododendron population upside-down, to change *R. repens* into *R. repens chamaedoxa* and *R. r. chamaethauma*, and substitute *R. tsangpoense* for *R. campylogynum*, *R. temoense* for *R. fragariflorum*, and *R. concatenans* for *R. doshongense*. So critical is shelter above the tree line that in the Seinghku valley, North Burma, between 11,000 and 12,000 feet an entirely different assemblage of Rhododendrons grows on either side of the valley within 200 yards. The exposed flank comprises a succession of almost naked screes, whose fan-shaped boulder-strewn bases coalesce just above the torrent. The sheltered flank, broken by low cliffs, is mostly covered with Rhododendron scrub, including species of 'Neriiflorum' while the screes support scattered dwarf species such as *R. pumilum*, *R. calciphilum* and *R. riparium* but also the larger *R. trichocladum*. On the sheltered slope the scrub forms solid tapering tongues which lick the mountain side like cones of fire, between narrower belts of stunted trees.

Rhododendrons do not in nature flower regularly every year. Some years they are smothered in bloom; in the years between they bear little or none. It certainly exhausts a big tree to flower all over, and then to ripen hundreds or thousands of fruits, producing millions of seeds; and although I have never watched a particular tree over several years (having tried to cover as much ground as possible in the course of my plant hunting career), I have come across trees which had obviously flowered profusely the year before bearing only a few trusses in the current season. That is where the cultivated plant has the advantage: it can be persuaded to make the best possible display each year, first by dead-heading it after flowering, secondly by giving it extra rations of mulch.

To return for a moment to spotting Rhododendrons in the forest, especially at lower altitudes. A few epiphytic species grow high up in big trees where crowns form a closed canopy. They cannot be seen except when in flower—and not even then unless one looks down on the forest roof from above. Their presence is detected from their fallen corollas strewing the ground, and intensive search will often result in finding an accessible specimen. I picked up corollas of two yellow-flowered 'Maddeni' species in 1937 (K.W. 13130 and 13195) in North Burma, several months before I secured other material. One of them produced

both flowers and ripe capsules in November, so it must have two flowering seasons.

In spite of their enormous numbers and their light, easily scattered seeds, few species of Rhododendron have a wide distribution, and with two exceptions, no species found within the Sino-Himalayan concentration has been discovered outside that area, even in the satellite areas. *R. arboreum* occurs along half the length of the Himalaya, and is the only species to have crossed the Indo-Gangetic plain (the "great plains of India") and reappeared in peninsular India on the very ancient uplifts known as the Ghats, whence it reaches Adam's Peak in Ceylon. Eastwards it reaches the Sino-Burma frontier, to be replaced inside Yunnan by its near-twin, *R. Delavayi*, which is hardly more than a variety. It would seem that *R. arboreum* must have been one of the earliest Rhododendrons to appear in the Himalayas. *R. Simsii*, a Chinese coastal species, reappears in Western China and in North Burma at very low altitudes—750–2000 feet.

It is a common observation that the leaves of many Rhododendrons (e.g. *R. sinogrande*) are much larger than normal before they reach flowering age. After they have begun to flower they seem to shrink, no doubt due to the fact that the same food supply now has to go further. This is apt to be deceptive when one finds a Rhododendron sapling with relatively huge leaves; but it is not confined to this genus. Another relationship between foliage and flowers is noticeable in the field, namely that the leaf buds of a flowering Rhododendron will break later than those of the same species before it has reached flowering age. In other words, Rhododendrons flower before the leaf buds open, a fact which suggests their derivation from a precocious deciduous leafed species—an Azalea in fact, turned evergreen. This has an important practical bearing, since it is obvious that if a tender plant can be successfully nursed through the winters till it reaches flowering age, it will thereafter be less likely to have its young foliage cut by late frosts.

In any part of Sino-Himalaya one can gauge something of the climate by the proportion of Rhododendrons to other woody plants, and by the number of epiphytes; the altitude by their number and variety. They are excellent indicators, sensitive to the slightest change, whether of climate, altitude, or aspect. But climate itself depends largely on altitude, so that one must suppose climate is all-important. It is not, however, the sole factor. There are many mountainous parts of South-East Asia (not to mention Africa) with climates suitable for Rhododendrons, where those plants are scarce, or entirely lacking; and one

infers that when the pre-glacial flora was being pushed around by the ice, Rhododendron never reached these places.

A genus so successful as Rhododendron, even over a limited area, provokes the question: how does it do it? They are not highly specialized plants. They do not exploit poor soil, swamps (a few species grow on ground made temporarily boggy during the rainy season), or semi-desert. They stick to one growth form, and the genus includes neither herbaceous nor climbing species. On the contrary, they are prepared for the battle of life, aiming for the most coveted ground, measuring themselves against all comers, ready to compete with and defeat the best.

If, then, they have a peculiar advantage in the struggle for existence, wherein does that advantage lie? Of course, conditions in the Sino-Himalayan mountains—soil, climate, length of day and of growing season, and so forth—must suit them admirably; but many other plants must be equally well suited. The most obvious reasons for their outstanding success seem to be: (i) the huge amount of fertile seed produced—dry seed, easily scattered by a light puff of air, winged in most of the forest species, wingless and dust-like in most alpine species; (ii) their gregarious habit and large, brightly coloured or otherwise conspicuous flowers; and (iii) their powers of resistance to disease.

That the abundance of seed produced has some bearing on the matter is suggested by the promptness with which Rhododendrons appear wherever an opening occurs. In the forest belt, between 6000 and 10,000 feet, they colonize every type of ground—boulders in the river bed, the mossy limbs of trees, the banks of newly cut paths, scree chutes, clearings. I have often been struck by the number of seedling Rhododendrons coming up, usually of a single species, wherever a new road is being cut through the hills. So low as 5000 feet they may be numerous, though you would be hard put to it to find a fully grown shrub in the forest at this altitude. Where forest has been burnt at 6000 feet I have seen two-three year old plants of *Rhododendron magnificum* crammed together like the citizens of London in the rush hour. At this age, and perhaps for many years, the leaves do not wear the characteristic under-surface pelt of the mature plant; they are often purple in colour and almost glabrous. The mature pelt may not be developed till the plant reaches its twenty-first birthday or perhaps not till it is of flowering age.

One gets the impression that in the fine weather the air is filled with Rhododendron seed circling round, waiting to pounce on the first available landing-ground, whether it be a roadside bank, a newly fallen rock, or a tree trunk; and where a seed lands, there it quickly germinates.

The gregarious habit of many species makes cross-pollination easier, and helps to hold the ground gained for that species, while the large, brilliantly coloured flowers massed in conspicuous heads can hardly be missed by the dullest insect. Not only do great numbers of one species grow in close association, but in the higher forest belt, and above the tree line, several species help to form each association, all flowering together. Nevertheless, hybrids, so easy to make in the garden, appear to be very rare in nature, and I cannot recall for certain ever having met with one, though they should not be difficult to recognize. Either they do not occur at all, or they are liquidated as dangerous before they flower.

Not very much is known about the pollination of Rhododendrons in nature, but there is no doubt that a number of ingenious structural devices are used to ensure cross-pollination. As to the agents, I have seen several species of birds—sibias and honey-suckers, for example, the former with their dark grey heads yellow-capped with pollen—visiting flower after flower, and undoubtedly pollinating them. Bees often visit the flowers, especially of the dwarf moorland species; butterflies rarely—the Rhododendron season is over before many butterflies have emerged from hiding. In the rainiest parts of Tibet, such as the Tsangpo gorge, I have found the inverted bells of crouching alpine species filled with tiny flies, much too small, one would think, to move the stringy pollen from one flower to another. The flies, however, may serve to attract birds, which effect pollination. I have seen tough tree Rhododendrons in full bloom, covered with snow at 7000 or 8000 feet—a sight not unfamiliar in Britain; and it is hardly likely that these early bloomers depend upon insects for pollination—even though "early" here means March-April.

Not a few species are deliciously fragrant, but these are plants which grow in extreme isolation, usually as epiphytes. Moreover, their flowers are generally white, or near white, and very large. Scent must, one would suppose, attract certain insects, possibly hawk moths; but I have never seen these tree-top species being pollinated, though they set good seed. Massed plants with brightly coloured flowers have no need of fragrance, and no such species known to me—except possibly a single tiny flowered 'Lapponicum' which I found on the Diphuk La in 1926—is fragrant. *RR. bullatum* and *megacalyx*, also fragrant, are by nature epiphytes, although often found growing on cliffs.

Finally, Rhododendrons in nature appear to have exceptionally sound constitutions; they are prone to attack neither by fungus nor by insect pests, the latter itself often the result of

*Colour photograph by E. de Rothschild, Esq.*

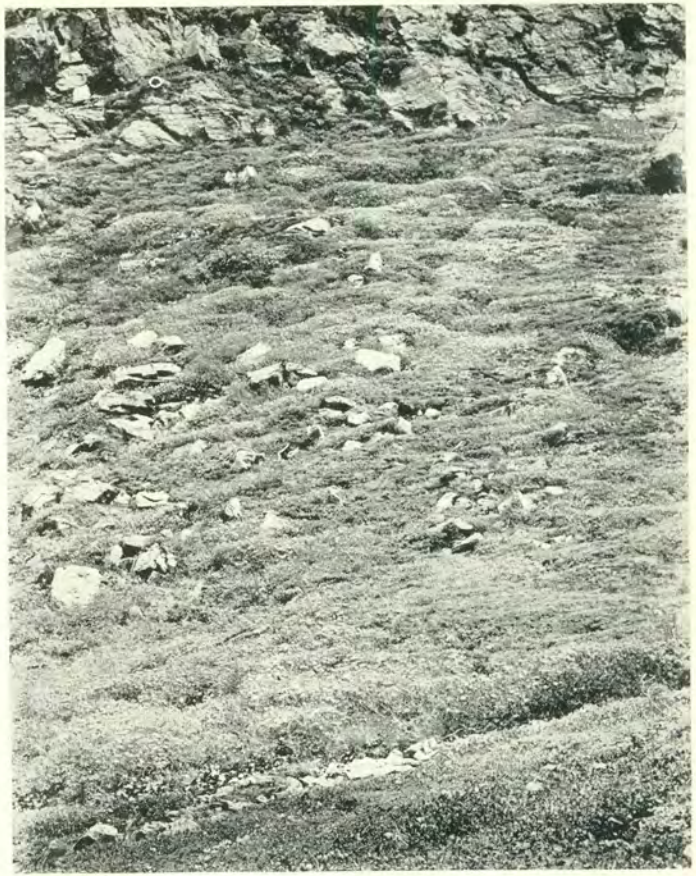
FIG. 1—*R.* 'Lady Berry' F.C.C. (See p. 188)

*Photo, J. E. Downward*

FIG. 2—*R.* 'Elizabeth,' a shoot with seven buds
(See p. 6)



FIG. 3—*R. ferruginum* L. 'The Rose of the Alps' which Linnaeus took as the type of the genus (See p. 30)



RHODODENDRON COLLECTING IN THE WILD

FIG. 4—A carpet of dwarf alpine Rhododendrons, about 12,000 ft., in Tibet. About a dozen different species represented here. Colours range from blood-red to pink, violet, purple, yellow and white (See p. 11)

FIG. 5—Captain Kingdon-Ward's camp in Tibet, 14,000 ft., at the foot of a glacier (See p. 11)

poor health. True, one finds the large capsules of *R. sinogrande* and a few other species bug-ridden—the result of puncture during youth by some insect which finds the growing ovary a promising receptacle for its eggs; when in due course the grubs emerge, they feed on the soft ovules. But this is rather exceptional.

The capsules of some of the moorland 'Lapponicums' are destroyed by a mildew-like fungus, but I have never seen anything in the nature of epidemic disease, nor failed to collect good seed of a species. Several species—notably *R. arboreum* and a Manipur plant allied with *R. ciliicalyx*—have their foliage attacked by—of all fungus diseases—blister blight! This is a matter of particular interest to the Tea industry of Assam, although it is probably a different species from that which is epidemic in the Tea gardens on the plains. But the blister blight of Rhododendrons and other Ericaceae is comparatively rare, and if it injures the plant, seems to have no effect on the species.

This is not, of course, a list of all the diseases to which Rhododendrons are heir; it comprises only those which I have noticed in the field. Curiously enough, honey fungus, which is such a curse in many English gardens, seems to be absent in the field, but it would be difficult to recognize its presence in the mountains.

While the above mentioned factors are no doubt partly responsible for the extraordinary success of Rhododendrons in the region of greatest concentration of the species, it can hardly be supposed that that is the whole story. The close association of individual plants is itself a result rather than a cause of success, though no doubt it leads to further success.

Whence is derived the adaptability of Rhododendrons, which have staked a claim between 5000 and 15,000 feet second to none, growing as trees, bushes, shrubs, or undershrubs (erect and prostrate), on the hillsides and along the valleys, in bogs and meadows, in forest and scrub, on cliffs and screes, and as epiphytes?

## DISCUSSION

*Sir William Wright-Smith, F.R.S., V.M.H.* Mr. President, I thank you for the opportunity of saying a few words on CAPTAIN KINGDON-WARD'S paper. I have listened with much interest to what he has told us and I have had the opportunity of reading the preliminary copy printed for this meeting. There are several points on which I would like to comment. He tells us that many of the tree Rhododendrons have pale smooth trunks and these innocent of alien vegetation such as even moss.

In the Rhododendron area most trees other than Rhododendron are plastered with epiphytes, especially where the climatic conditions are markedly moist. We do know that in the wild and also in gardens certain of these tree Rhododendrons shed their bark very freely. This is the case with *R. Falconeri* and *R. Hodgsonii*. These species scale off all the old bark, including buds, from all their branches except the very youngest. The result is that a very thin smooth bark is left and that does not seem to give much opportunity for the seeds or spores of epiphytes to secure a settlement. But under certain conditions some of the species, especially in the series Azalea, do manage at times to accumulate on themselves quite a number of lichen epiphytes, as can be seen now and again in cultivation in this country.

KINGDON-WARD makes reference to the number of species which pass a portion of their life as epiphytes. These, however, frequently take the opportunity of getting in contact with the soil. I do not think that any of them are grown as epiphytes in this country as climatic conditions are quite unfavourable. It is not unusual in some gardens to find *R. racemosum* and *R. virgatum* attaching themselves to large rocks where there is an accumulation of moss. Under these conditions they exist for quite a number of years. It is interesting to note that in KINGDON WARD'S view *R. micromeres* and *R. seinghkuense* are complete epiphytes. I would still have the suspicion that even these will establish themselves in the soil when the chance is given.

Attention is called to the entire absence of obvious hybrids in the field. Experience with the Sikkim Rhododendrons seems to me to be a complete confirmation of WARD'S view. In this country we have been getting seeds of Sikkim Rhododendrons for nearly 100 years and there is little or no evidence during that time that any obvious hybrid has resulted in cultivation from the seed—leaving out all consideration of variation within a single species.

I agree also with WARD'S view of the vitality and good health of the genus. In their own regions they dominate the areas they occur in and do not seem subject to any particular destructive disease. It is therefore disturbing to have reports in this country of the prevalence of some disease turning the flower-buds black. Whether this is going to be a serious menace remains to be seen, and I understand that it is now under investigation. In Edinburgh on certain species and hybrids we have flower-buds killed, but that result so far we have attributed to early frosts, especially when these frosts are preceded by open weather two or three weeks before, encouraging some of the buds to half open. But

the fungus disease which is causing anxiety elsewhere has so far not appeared in the Edinburgh collection, although it does occur sporadically here and there in Scotland.

WARD also calls attention to the sharing of territory by several species. There is sometimes a tendency to show that every species is specially attuned to its habitat, but with Rhododendron you may have quite a number of species occupying a small area showing very little variation in the environment. Yet the species which have colonized that area have solved their problems each in its own way. The conclusion I would draw is that they are reasonably catholic in their tastes as regards environment. Each one has found its answer to the equation and apparently the number of answers to the equation is a large figure.

In my experience the Rhododendron forest area is a very close formation and does not permit of any large number of young plants coming away from seed. It is quite otherwise, as WARD points out, when a piece of ground is cleared for a new road or where the previous cover has been destroyed by drought or by forest fire. The new opportunity for space is at once seized upon by various species which produce seed freely. There is a marked contrast however between what happens in these conditions and what happens in ordinary gardens where the climate is very much on the dry side. Of the millions of seeds of Rhododendron scattered in our British gardens, particularly on the east coast, very few have the slightest chance of success. We all know what conditions Rhododendron seeds require when we are germinating them. A period of dryness puts an end to the experiment. It is only where conditions in this country are specially favourable, as for example amongst moss which is very retentive of moisture, that the Rhododendron seedlings ever manage to establish themselves.

# RHODODENDRONS IN THE GARDEN

LORD ABERCONWAY, C.B.E., LL.D., V.M.H.

(*Paper read on April* 26, 1949, SIR WILLIAM WRIGHT-SMITH, F.R.S., V.M.H., *in the Chair*)

WHEN one speaks of Rhododendrons in the garden, one has perforce to rely chiefly on one's experience in the garden which one owns.

I speak from an experience of 50 years of a place where neither the soil nor the climate are especially favourable for these plants, although, fortunately, the soil is free from lime and stagnant water.

The first object, of course, in a garden is that the plants should be healthy, their leaves a good green and their growth free. For this, first and foremost, the soil for Rhododendrons must, I need hardly say, be lime free.

Then the Rhododendrons should not be planted beneath the branches, nor among the roots, of trees—but they should have, if possible, some shelter from the wind and from too bright sun, say, by being planted on the North side of trees or between scattered trees. They should, if possible, be planted in trenched beds, and whether in beds or isolated, they should be lightly top-dressed each year with dead leaves or leaf soil. A waterlogged soil such as a clay soil on the flat without artificial drainage will never be satisfactory, and again, a position which is a frost hole, namely, one where frosty air accumulates in the Spring, will be a hard trial to early flowering and early growing plants. Lastly, Rhododendrons will put up a surprisingly good fight against wind if otherwise the site is suitable.

When one has selected a site for one's Rhododendron Garden, or it may be one's Rhododendron Clump, may I emphasize that it is very well worth while trenching the bed where the plants are to be placed, putting in the bottom of that bed any miscellaneous vegetable rubbish, and in the top of it, if possible, leaf soil or peat —leaf soil being for all practical purposes quite as good as peat.

In this bed the Rhododendrons can be planted fairly close together, so that they will begin to get a little crowded in three or four years, and then will be the time to re-dig the bed and to re-arrange the plants further apart from one another—the surplus going to form a new colony.

I find it often the case that if a bed is dug on a new site, even with great care and good preparation, there may be an insufficiency of humus in the soil, and that the second digging over,

when successive yearly top-dressings can be trenched in, much improves the welfare of the plants.

Disease, it is satisfactory to say, is almost negligible. The only treatment that I have had to give for disease in 50 years is to rid three plants from the Lace Fly, which I have done with a couple of sprayings, and one plant from Honey Fungus which was accomplished by a bonfire on the affected ground. There was no recurrence in either case.

Eventually those who plant a Rhododendron Garden must choose whether they like their Rhododendrons close together forming a mass, or whether they like each one to stand alone in perfect shape.

Many of the smaller Rhododendrons, expecially *R. aperantum*, seem to thrive better if grown in a mass. On the other hand, the large leaved Rhododendrons and the *Arboreums* with their fine habit are better if they can be grown so that the individual beauty of each is unimpaired.

I remember that on one occasion the late SIR GEORGE HOLFORD was showing me his Rhododendron plants at Westonbirt. In a wide recess sheltered by great Yew Trees, he had planted three large plants of *R. Falconeri*. I thought to myself that in that space I should have been tempted to plant a dozen Rhododendrons and not three. But how right SIR GEORGE had been only to plant three.

I would therefore suggest that the large growing Rhododendrons should be kept sufficiently apart from one another, while the small ones and the Azaleas might be allowed to grow together and form one massed effect.

Unless spring frosts are very persistent in the district, or there is a definite frost hole, I am inclined to think that it is best to ignore them. As a rule one experiences at least one spring frost each year. It may come in March—it may come in April—it may come in May. All the flowers will be blackened when it comes, but in ten days or a fortnight after the frost has disappeared, fresh buds will be coming out. The incidence of spring frost is too irregular as a rule for it to be possible to guard against it. The early flowering Rhododendrons too, such as *R. praecox*, 'Nobleanum,' *moupinense*, *arboreums*, and many others are too welcome after the spell of Winter for one to dispense with them merely because they are sometimes spoilt by frost.

On the other hand, I feel that if one is unduly fearful of frost and goes to the other extreme and plants Rhododendrons that flower in June or July, one enjoys them less because the mind is sated with Rhododendron flowers, and those that flower last are rarely the best—they are rather an anticlimax.

The choice of plants is a matter on which all see differently. The old hardy hybrids are rather out of fashion to-day, but when they are of great age and size as at Sheffield Park in Sussex, they can be very wonderful, even although their individual flowers would not stand modern criticism. Who, for instance, would be without Rhododendrons 'Ascot Brilliant,' 'Endsleigh Pink' and 'Lady Eleanor Cathcart.' On the whole, however, more pleasure is probably obtained when one has groups or beds of plants whose flowering season extends over two or three months, and where the individual plants in flower get in turn a green background from their neighbours. A bed of hardy hybrids all flowering at the same time is not really so beautiful or interesting as a bed or group of plants of which perhaps one in ten is flowering and where the succession is kept up for very many weeks.

On the other hand, when one goes to Azaleas (other than some of the early flowering deciduous Azalea species) one is almost bound to get a show all together, and there is no doubt that a planting of Ghent and Mollis Azalea hybrids, coming as they do very near together in flowering season, or a stretch of evergreen Azaleas planted to make a Persian carpet effect, or it might be a broad planting of the dwarf hybrids, from Rhododendrons *repens* and *aperantum*, is most beautiful when in massed flower. I say hybrids in this last case because they flower freely while the species, as a rule, do not. Such groups are well worth planting in any Rhododendron garden.

There are other effects that one can try—the large leaved Rhododendrons, such as *Falconeri* and the beautiful *eximium*, and *Macabeanum* (a little tender this) with its yellow flowers, and *sinogrande* with its huge leaves, too tender alas in many places, make a wonderful effect for foliage if planted in a great group together—but the effect is foliage as a rule rather than flower—for they do not flower freely or young.

Then again Rhododendrons of the Cinnabarinum series, *cinnabarinum* itself, *Roylei*, and the nearly allied *R. concatenans* (KINGDON WARD'S 'Orange Bill'), and many of their hybrids are very beautiful all the year with the glaucous tinge of their foliage, and make a fine effect in a great group.

A planting too of the early flowering deciduous Azalea species is very lovely if one will disregard spring frosts. There are Azaleas *pentaphyllum*, *Schlippenbachii*, *Albrechtii*, and other species, with flowers poised like butterflies upon the leafless branches. Again, one may have a group of *Rhododendron Augustinii* and its near allies and hybrids with their mauvy-blue flowers. A good plant of *R. Augustinii* is perhaps the most beautiful Rhododendron that there is. Again, a clump of the best forms of the pink

*R. Davidsonianum*, and the good forms of *R. yunnanense* are very fine together, with their good shape and wonderful profusion of bloom.

In very many gardens, and round every house, there are uninteresting walls facing North on which, as a rule, no climber grows. If care be taken to dig out the lime-sodden rubbish which builders always leave at the foot of the wall and to replace it with good Rhododendron soil, the scented greenhouse Rhododendrons can, in most districts, be grown to great advantage.

These Rhododendrons are principally old hybrids of *R. Edgworthii* with *R. ciliatum*, such as R. 'Fragrantissimum'; R. 'Lady Alice Fitzwilliam'; R. 'Suave,' and, perhaps best of all, R. 'Princess Alice.'

In a severe winter they loose some of their flower buds, but they are free flowering, and, as a rule, enough buds remain. The flower buds of R. 'Princess Alice' seem to be hardier than those of its kin.

On the other hand, the nearly allied R. 'Countess of Haddington' usually loses all its flower buds.

There are some forms of *R. crassum* which are hardier than most and these can also be tried in such a position.

The plants themselves will stand in such places up to 25 degrees of frost without much injury.

While one can well segregate these plants in groups of their own kind, the mainstay of the Rhododendron garden must be the Himalayan and Chinese species of medium leaf and stature and their many hybrids.

There is no doubt that of Rhododendrons in the highest class, lovely as are many of the species, they are to-day out-numbered by hybrids of similar beauty and even greater variety and adaptability.

There are two great groups of hybrids which are extremely noteworthy. The *R. Aucklandi* group, to use the good old garden name of this species, which gives so much of the beauty of its flower to its hybrids, while it rarely gives that tenderness to frost with which it is itself so handicapped. It is *R. Aucklandi* which has given R. 'Penjerrick' its supreme loveliness—possibly the most beautiful of all the well tried hybrids—and it is *R. Aucklandi*, of course, which has given to R. 'Loderi' its amazing huge, pale-pink, and scented flowers.

*R. Griersonianum* on the other hand, itself again not too hardy, has evolved a huge group of hardy descendants in colours of orange, scarlet and pink. These have the added quality of flowering with the very greatest possible abundance at the very earliest possible age.

But these two parents are only two out of many.

I think that I should put *R. haematodes* third among the parents, with its brilliant scarlet colouring and its dwarf habit, both of which are freely inherited. Many of the *R. haematodes* hybrids have the strange power to produce flowers with the scarlet calyx almost as large as the corolla, and yet the calyx of the parent itself has quite an insignificant size. This strange feature adds greatly to the beauty of a flower.

Of other parents, I would put *R. repens* very high, and for two reasons: while usually a shy flowering plant itself, its progeny are amazingly floriferous, and also it has the gift of transmitting in large proportion its own prostrate, almost creeping, habit—a very great asset in these days of small gardens.

Hybridizing Rhododendrons is a fascinating task. The work is so easy; the results are so splendid; the field so vast.

Speaking generally, hybrids do flower more freely than their parents, and they are more hardy than their parents. Take, for example, *R. Aucklandi* × *R. Griersonianum.* Both these parents are somewhat tender—the first suffering very much from spring frosts, and the second suffering from an easily split bark; yet their joint progeny 'Sunrise' is amongst the hardiest of plants.

Lastly, if I were to ask myself—'Shall I have Rhododendrons in my garden?'—I would say 'yes' for these reasons.

There is an unlimited choice of hardy forms; they are easy to grow; they are not subject to disease; they are gorgeous in their flower, and, what is very rare in any one genus, they can be had in red, yellow or blue colourings, if one can tolerate just a touch of mauve in the blue. They can easily be propagated either from seed, (which must be hand fertilized if it is to come true), or from layers, or, in many cases, from cuttings, so that one can multiply one's favourite plants until one's garden and one's friends' gardens could not hold them all.

Then they are evergreen—except of course for the Azaleas with their attractive winter buds—and so make the best of shelters and the best of backgrounds. And not only are they evergreen, but most often of beautiful shape as plants, and with some of the loveliest of leaves, leaves some of them with reverse of silver and gold. In July when practically all their flowers are over and their growths are made and fresh, one is inclined to think, would not one plant them for their leaves alone?

Perhaps, however, the supreme virtue of Rhododendrons to a gardener is the ease with which they can be moved. If one plants an ordinary shrub border one has to look 10, 20 or 50 years ahead, so that two favourites will never be too close, for many shrubs move with difficulty and are set back for years in the process.

Rhododendrons, however, really enjoy, being moved. They get a little extra attention and a good watering if it is dry, and a new bed with a little more leaf soil in it. Curiously enough too, the older a Rhododendron gets, the more easily it moves, provided always that one has a sufficiency of man-power actually to lift it. The matted roots, as the plants grow older, make a very dense ball with the soil, and if your men can lift the whole by hand, or by some ingenious contrivance, then the plant hardly knows that it has gone to a fresh site.

Take it all round, no group of plants give a larger dividend of beauty and of interest for a smaller outlay of capital and labour than the great race of Rhododendrons.

## DISCUSSION

### BUD BLAST

*Mr. K. H. Scougal* of Oxshott, Surrey. From the President's paper it would appear that he has not been troubled by "bud blast" which has recently become a serious plague in some places.

Our Surrey garden comprises about 2 acres of peaty sandy soil in which Rhododendrons and Azaleas thrive, growing to 15 or 20 feet, and seeding like weeds.

All were flourishing till three years ago, when some brown dry buds were noticed on one or two trees. At first we blamed frost; but next spring the brown buds were more numerous on the same and neighbouring trees and appeared also in other parts of the garden. In April 1948 we sent specimens to Wisley and the trouble was diagnosed as "bud blast." Now the disease has spread over most of the garden; some trees have only a few branches affected, but some carry more blasted than healthy buds. Other gardens in this district are also suffering.

The trees now worst smitten are two 'Pink Pearls' and an adjacent 'Fastuosum flore pleno,' which used to flower abundantly but now have quite 90 per cent. of their buds blasted, and a red unnamed hybrid which was the first to show the disease. Other hybrids 'praecox,' 'odoratum' and *R. ponticum* and Azaleas (Mollis, Ghent and *R. luteum*) are affected to a less degree.

From its incidence the disease appears clearly infectious and in particular it seems that almost all growth beyond a blasted bud carried buds that eventually become blasted, though at first they may look clean. Some branches carry three generations of infected buds. On the other hand, the wood behind the bad bud is discoloured only a very short distance if at all.

Cutting back may therefore prove to be a remedy but it is only practicable for a limited number of accessible bushes.

*Captain A. Maitland-Dougall, R.N.* Supporting the former speaker, who had raised the question of "bud blast" in Rhododendrons, CAPTAIN MAITLAND-DOUGALL said that in his garden near Woking "bud blast" had become a serious menace to Rhododendrons. It appeared to be caused by a fungus that could be seen under a lens or low power microscope, which attacks the flower buds, killing them so that they become hard and brown. It also attacks and kills shoot buds, and causes a die-back of twigs.

The effect of "bud blast" was first noticed in 1945, since when it had increased rapidly, until last year (1948) no less than 60,000 buds were picked off and burnt, and no doubt as many more could not be reached or were overlooked. Each of these represents a truss which failed to bloom so the loss of colour is serious. This figure of 60,000 was computed by weight and measurement; but 1020 counted flower buds were picked off one Rhododendron alone.

The disease had been found to be most prevalent in certain areas of the garden, which was one of several reasons for believing it to be infectious.

Almost all kinds of Rhododendrons seemed to be susceptible to "bud blast"; some more than others. Particularly bad cases (up to 100 per cent. of the flower buds) had occurred on bushes of *R. Souliei*, *Fargesii*, and *caucasicum pictum*, and various Rhododendrons with *arboreum* blood had suffered severely, but this might have been partly fortuitous and due to their having been in especially infected areas. The only definite evidence of resistance had been shown by the true species *R. auriculatum*, and it was suggested that this *might* be due to the peculiar construction of the sepals and the fine hair covering them, which might stand-off the spores of the attacking fungus. Azaleas, Mollis and Ghent, whilst not immune, appeared to have suffered less than Rhododendrons.

A heart-breaking case had been a large plant of *R. Souliei* which (in the winter) promised to be a fine sight with well over a thousand flower buds. In the end this bush had opened just one truss, and that had been deformed! It was all the more distressing because in the past Rhododendrons were singularly free from disease. Rhododendron bug (*Stephanitis Rhododendri*) was a pest, but could be abated by spraying. "Bud blast" was far worse, and up to date no preventive was known.

For several different reasons CAPTAIN MAITLAND-DOUGALL believed the disease to be infectious, and presumed that it was at least partly spread by fungus spores. The season of greatest

infection was not known, but since flower buds began to show disease by October, soon after they had formed, the autumn might be one infectious period.

Many instances had been noted of four diseased flower buds on one stalk, one at each year's growth; and where a diseased bud of a former year had been seen, the new bud of the current season had almost invariably been infected.

There was, however, one note of hope. Last year's picking of diseased buds had definitely done good. Where the picking had been done thoroughly, the plants this year, although probably not clear, were quite certainly flowering better than before. Meanwhile, however, on the unpicked taller Rhododendrons and on shelter belts of *R. ponticum* etc. the disease was as bad or worse than last year.

There seemed to be no doubt that "bud blast" was a serious and rapidly increasing threat, and that Rhododendron owners should pick and burn all diseased buds that they could—until better preventive measures could be devised.

*Mr. G. G. Nearing* of New Jersey, U.S.A. Rhododendron "bud blast" is a disease prevalent in some parts of eastern United States, and may have made its way to England. It was first noticed in 1874 infesting buds of the wild Azalea, *Rhododendron nudiflorum*, in New York. From that time until about 1930, little attention was paid to it. In fact, even now it is of minor importance, seldom gaining headway where plants are given proper care and natural conditions.

Loss of flower buds on Rhododendrons is usually due to cold. Each species or variety, enduring so many degrees of frost without damage, will, if subjected to more severe cold, first abandon the flower buds, then, if the cold is intensified or long continued, allow tips or whole branches to die. When bud injury results thus from low temperatures, the buds may retain both shape and colour until spring, the only evidences of injury being a slight shrivelling and a tendency to yield easily when pressed between thumb and finger. Sound buds remain hard and plump until they enlarge for the opening of the flower clusters.

By contrast, buds infested with bud blast show a shrinkage in late summer or early fall, then gradually turn brown, the bud scales spreading open a little. But those infected later may not show the injury until spring, and may even open a few stunted flowers. The infested and dried buds, unless removed, remain on the plant for two or three years, during which time they put out at intervals dark brown or blackish, hair-like stalks surmounted by small dark heads, in appearance a sparse, blackish mould.

This mould may appear also on dead twigs and capsules, for the fungus does not confine itself to the bud, spreading into the

twigs and bark, and eventually, unless checked, often killing the plant. Since these mould-stalks, known as coremia, resemble the stalked glands found on such Rhododendron species as *dasycladum*, *glischrum* or *viscosum*, care must be exercised in deciding whether they are, in fact, the coremia of bud blast. An expert mycologist will recognize them by the coremiospores or conidia which they bear.

The name of the fungus, formerly *Periconia azaleae*, is now *Sporocybe azaleae*, closely related to Graphium. It is described in detail by W. H. Davis, writing in Phytopathology, June 1939, and again in 1940.

Once the nature of the fungus is understood, infestations are easy to control. Diseased buds should be cut away, with an inch or two of the stalk beneath, if on Azaleas, more on evergreen Rhododendrons. Thus they will be prevented from putting out the spore-bearing coremia later, and the disease will have no means of spreading. It is not necessary to burn the buds and twigs, but they should be buried, or at least removed to a distance from the plants.

Where growth is large and dense, it may be impracticable to try to remove all the buds affected. A spray of Bordeaux mixture in fall and again in spring will help greatly. DAVIS recommends 5–5–50 (5 lbs. quicklime, 5 lbs. copper sulphate, 50 gallons water) for deciduous Azaleas, but this is much too strong for evergreen Rhododendrons. Better 2–2–50, which can be used also during the summer, when it will effectually check germination of the coremiospores, and will combat most other fungous diseases at the same time.

*Mr. O. C. A. Slocock.* "Bud blast" is only moderately infectious; so far it is confined to a few types only: 'Pink Pearl' and its hybrids, 'Doncaster,' and species as *decorum—Souliei* and *astrocalyx* are the most affected.

Certain types appear immune, and amongst many are the hybrids of *campylocarpum* and *Griersonianum*.

Without direct control, the disease has never spread so as to affect seriously the display of flowers; full grown and old established specimens only showing it. It is never found in younger plants, however many buds they may have. It has shown signs of decrease with post-war cultivation and feeding.

A suggested remedy is to feed with manure and leaf-mould the old infected plants, and to cut back, removing at the same time all dead wood. Spraying would be effective only if the exact time of infection is known, and even then most fungicides contain lime. The period of infection appears to be the early autumn.

Azaleas at Goldsworth have not been affected.

# A SURVEY OF THE GENUS RHODODENDRON

Dr. J. MACQUEEN COWAN



(*Paper read in part on April* 27, 1949, SIR EDWARD SALISBURY, F.R.S., *in the Chair*)

## 1. INTRODUCTION

IN attempting to survey the genus Rhododendron in the short time at my disposal, it will be necessary to summarize very briefly certain aspects of our subject in order to discuss others somewhat more fully.

I trust that it will meet with your approval if, instead of reviewing the series in turn, I devote the greater part of my time to recent investigations I have been making, which have as their general aim the clarifying and simplifying of the classification of the genus. In the course of these studies I have been confronted with many problems and we have still a very long way to go before our knowledge of the genus, one of the largest in the whole plant kingdom, can be regarded as comprehensive or by any means complete. I should like to explain to you what some of the problems are; how some have been overcome; and how some others may best be solved.

I can, therefore, deal only very briefly with the history of the genus and with its wide geographical distribution. I shall then pass rapidly on to consider the great range of diversity within the genus, to discuss the essential characters by which the species may be arranged in a systematic manner, and to indicate where the classification seems to be in need of revision.

## 2. HISTORICAL OBSERVATIONS

*The name Rhododendron in classical literature—The early herbals—First reference to Rhododendrons in gardens—The genus Rhododendron founded by Linnaeus—In the year 1800 twelve species known—Sir J. D. Hooker in the Himalayas—British gardens enriched—Robert Fortune in China—French Catholic Missionaries in W. China—Collectors in Japan and New Guinea—In the year 1900 two hundred*

*and eighty species known—Famous collectors of the present century—The revolution of gardening—Botanists of the present century—In* 1930 *eight hundred and fifty (approx.) species recognized—Publication of The Species of Rhododendron.*

The genus Rhododendron, as you are aware, was founded by Linnaeus in his "Species Plantarum" which was published in 1753, and he took as his type *Rhododendron ferrugineum*, the 'Rose of the Alps' (Fig. 3). The name Rhododendron, a Greek name, was used both by Dioscorides and by the Roman Pliny and means the 'red' or the 'rose tree.' It is a curious fact that both these writers, when they used the name, applied it not to a Rhododendron but, as is clear from the context, to the Oleander, *Nerium Oleander* Linn.

I have been unable to trace the occurrence of the name anywhere else in early Greek or Roman literature. We connect the poisonous honey of Xenophon's Anabasis with *R. luteum* Sweet, although the source of the honey is not mentioned and the name Rhododendron does not appear in the text.

When we come to a later period, the sixteenth and seventeenth centuries, we should expect to find frequent reference to Rhododendrons in the early Herbals, because the 'Rose of the Alps' must obviously have been well known to the authors of those works, and yet the name Rhododendron is rarely mentioned.

The French writer Matthias de L'Obel, better known as Lobelius, is one of the exceptions and he has it in his "Plantarum Seu Stirpium Historia" which appeared in 1576; but, like Dioscorides, he applied it not to a Rhododendron but to the Oleander. Then too, Andreas Caesalpino, sometime Professor of Botany at Padua, whose renowned work "De Plantis Libri XVI" was published in Florence in the year 1583, speaks of the "Nerion or Rhododendron" when giving an account of the Oleander (Lib. III, Cap. XLI). But later he describes another plant in the following terms: "A certain plant which grows in the Alps in rough and stony places, with leaves like the Box, green on the upper side, glistening below or with an adherent reddish-brown dust, with handsome flowers so like those of Rhododendron that some people call it Alpine Rhododendron." (Lib. XV, Cap. XVII). Clearly, Caesalpino is now describing *R. ferrugineum* Linn., and this brief remark is, as far as I can discover, the first record of the name Rhododendron being given to a plant which we call by this name to-day.

But none the less the Alpine Rose, as I had supposed, was well known to the writers of this time. After some search I found descriptions which undoubtedly refer to the Alpine Rose

in other Herbals (though *R. ferrugineum* Linn., and *R. hirsutum* Linn. are sometimes confused) and in several instances these are accompanied by realistic drawings, as in the Herbal of Charles de l'Ecluse "Rariorum Plantarum Historia" which first appeared in 1576. These descriptions are, however, not related to the name Rhododendron, but are under such other names as Cistus, Ledum, Balsamum, Rosa, Azalea and Chamaecistus.

In passing, it is interesting to note that the first reference in literature to Rhododendrons as garden plants belongs to this period. Parkinson in his "Paradisi in sole Paradisus terrestris" (Chap. CXI, 424), published in London in 1629, entitles one of his sections '*Ledum Alpinum* seu *Rosa alpina* The Mountaine Sweet Holly Rose', and under this heading he writes: "The fragrant ſmell with properties correſpondent of two other plants, cauſeth me to inſert them in this Chapter, and to bring them to your knowledge, as well worthy a fit place in our Garden. The firſt of them hath diuers ſlender woody branches, two foote high or thereabouts, couered with a greyiſh coloured barke, and many times leaning downe to the ground, whereby it taketh roote againe: vpon theſe branches grow many thick ſhort, hard green leaves, thicke set together, confusedly without order, sometimes, whitiſh underneath, and ſometimes yellowiſh: the toppes of the branches are loden with many flowers, which cauſe them to bend downwards, being long, hollow and reddiſh, opening into fiue corners, ſpotted on the outſide with many white ſpots, and of a paler red colour on the inſide, of a fine ſweet ſent: after the flowers are paſt, there follow ſmall heads, containing ſmall browniſh ſeede: the root is long, hard and woody, abiding better if it comprehend in the ground, then ſome of the former, becauſe his originall is out of a colder country." As far as I know this is the earliest record of Rhododendrons in cultivation.

Prior to the publication by Linnaeus of his monumental work, not only had the two European species been called by many names, but, with the discovery of others beyond the limits of Europe, the general confusion in nomenclature had become even more pronounced. As happened universally in other genera, so in Rhododendron—cumbrous phrases did duty for names. Thus *Rhododendron indicum* Sweet (erroneously assumed to be an Indian plant, actually a native of China and Japan) was called "Chamaerhododendron exoticum amplissimis floribus liliaceis" by Breyne, while the North American *R. maximum* Linn. was designated "Chamaerhododendros lauri folio, sempervirens, floribus bullatis corymbosis" by Catesby, and both were otherwise described in long sentences by a number of other authors.

What prompted Linnaeus, when he inaugurated the binomial system, to choose the name 'Rhododendron' for the 'Rose of the Alps' and thus for this whole genus, we do not exactly know, but Cistus, Ledum and other names had already been appropriated for other genera and Azalea he reserved for an independent genus; probably Rhododendron was the most pleasing and least cumbersome of those that were left.

Be that as it may, we owe to Linnaeus not only conciseness of nomenclature and the establishment of the genus, but also the sorting out of the many earlier names; for even in his time when only a few species were known, the nomenclature already had become exceedingly obscure and involved. Linnaeus, in 1753, was in fact acquainted with only nine species of Rhododendron including Azalea, which he ranked as a separate genus (allowing for a certain confusion of names).

Even by the beginning of the nineteenth century no more than some twelve species had been described and indeed during the first half of the century only a few more names were added.

About 1850, however, two notable events in the history of the genus occurred, the first being Sir Joseph Hooker's visit to the Eastern Himalayas. We need not do more than refer to this expedition; his journeys are vividly and fully described in the well known Himalayan Journals. The noteworthy facts are that he discovered forty-five new species which are described and beautifully illustrated in "Rhododendrons of the Sikkim Himalayas" and, moreover, that he was the discoverer of almost every species that exists in this region. The same ground has been constantly covered since then and virtually no other new species has been found in this district.

British gardens owe a great deal to Hooker's expedition, for he collected large quantities of seed which he distributed amongst his friends. Plants raised from this seed, now magnificent specimens, the largest of the kind in the country, may be seen still growing vigorously in such gardens as Caerhays, Penjerrick, Leonardslee, Lochinch, Culzean Castle, Logan, Stonefield and Inverewe.

The second outstanding event at about this time was the journey to China of Robert Fortune, who, after training at Edinburgh, was sent out on behalf of the Royal Horticultural Society. Not only did he introduce the tea plant from China to India, but he also introduced to this country the Rhododendron (*R. Fortunei* Lindl.) which bears his name, the parent of a very notable race of hybrids.

Now, we may again pass over a quarter of a century when there was little further activity, and this brings us to the period



FIG. 6—An early drawing of 'Balsanum alpinum' (*R. ferruginum* : 'The Rose of the Alps') reproduced from Matthias de l'Obel's *Plantarum seu Stirpium Historia*, published in Antwerp in 1576 (See p. 30)

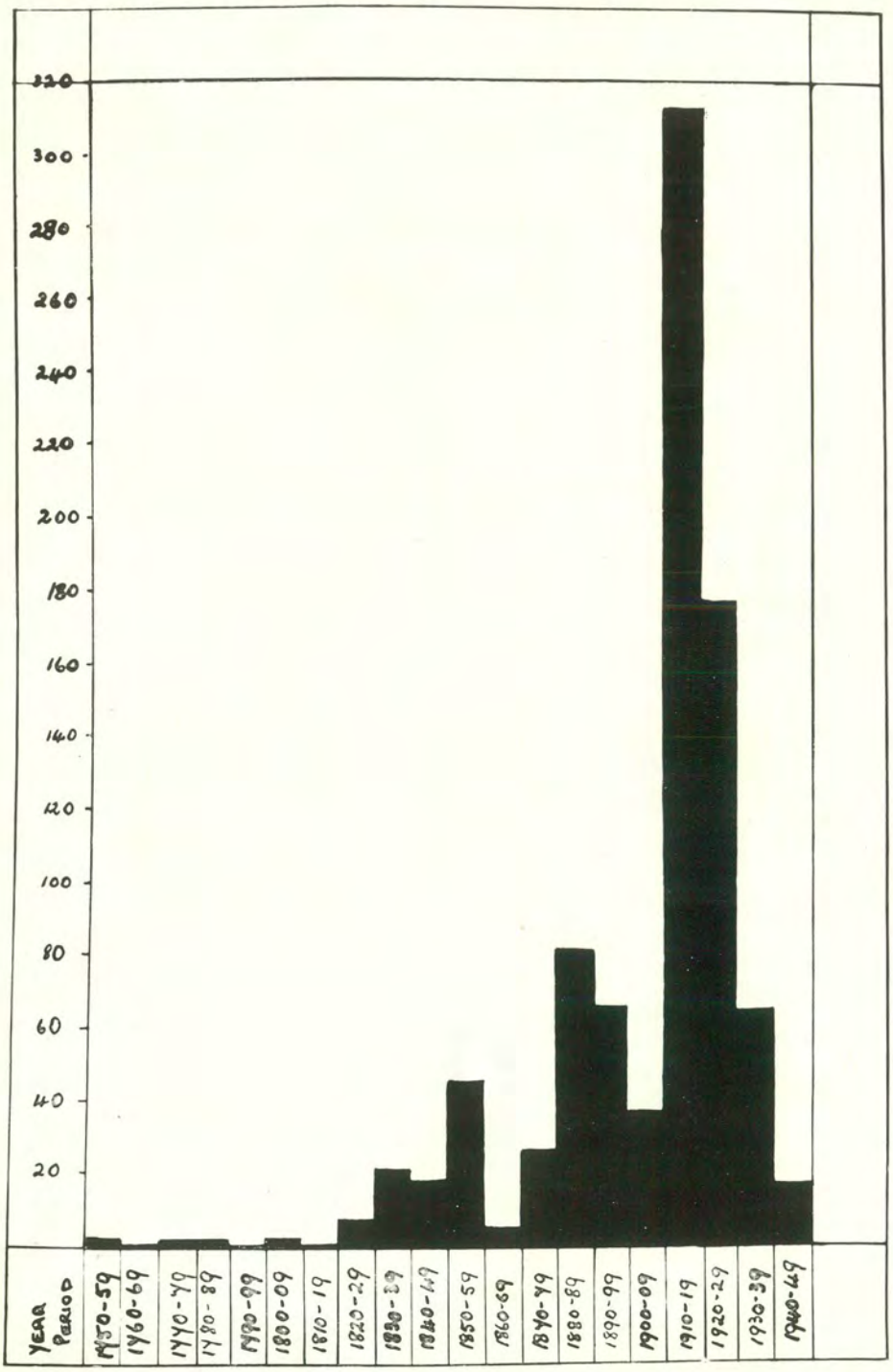



FIG. 7—Diagram to show the number of species of Rhododendrons described in each decade from 1750 (See p. 34)

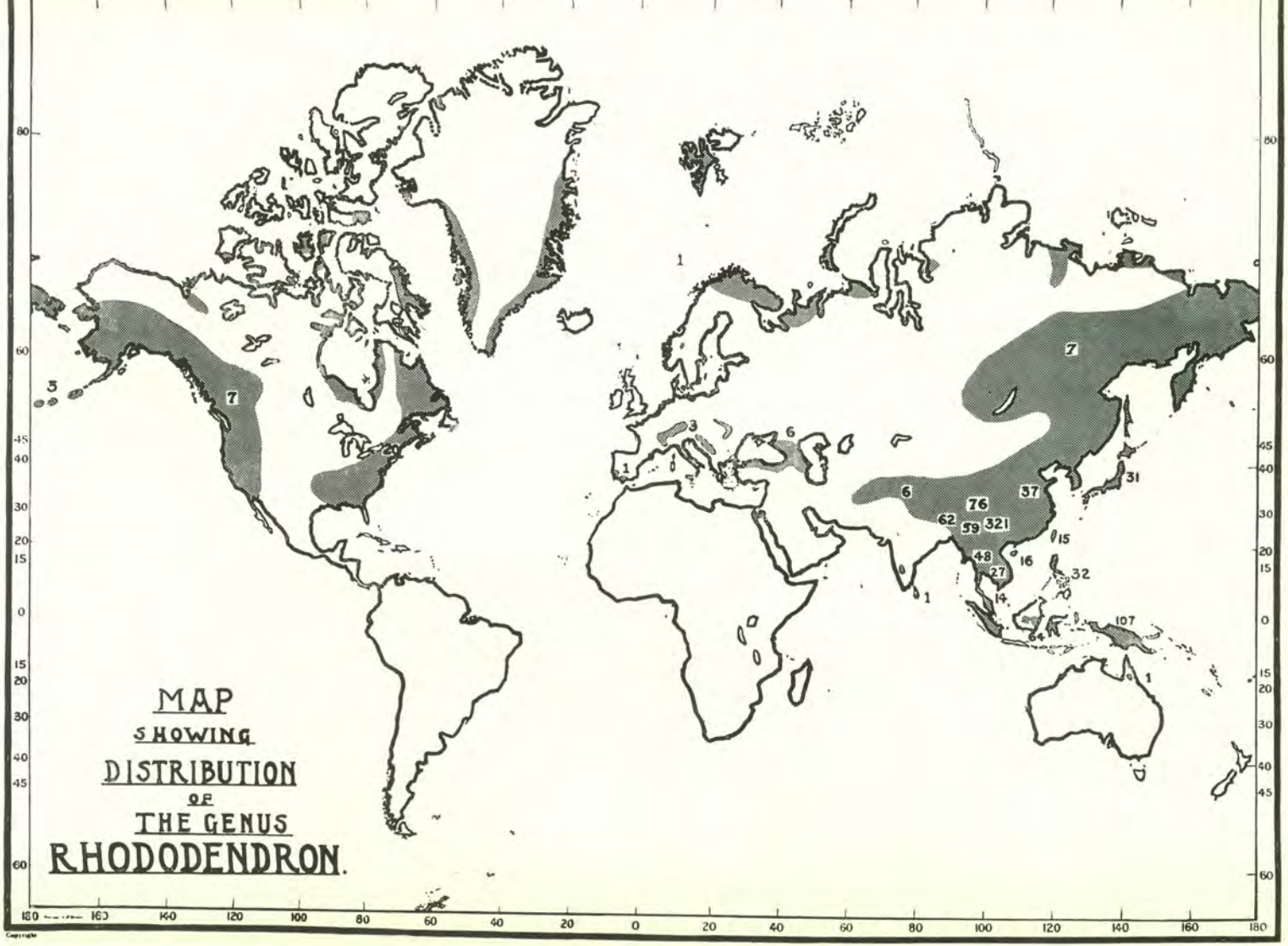
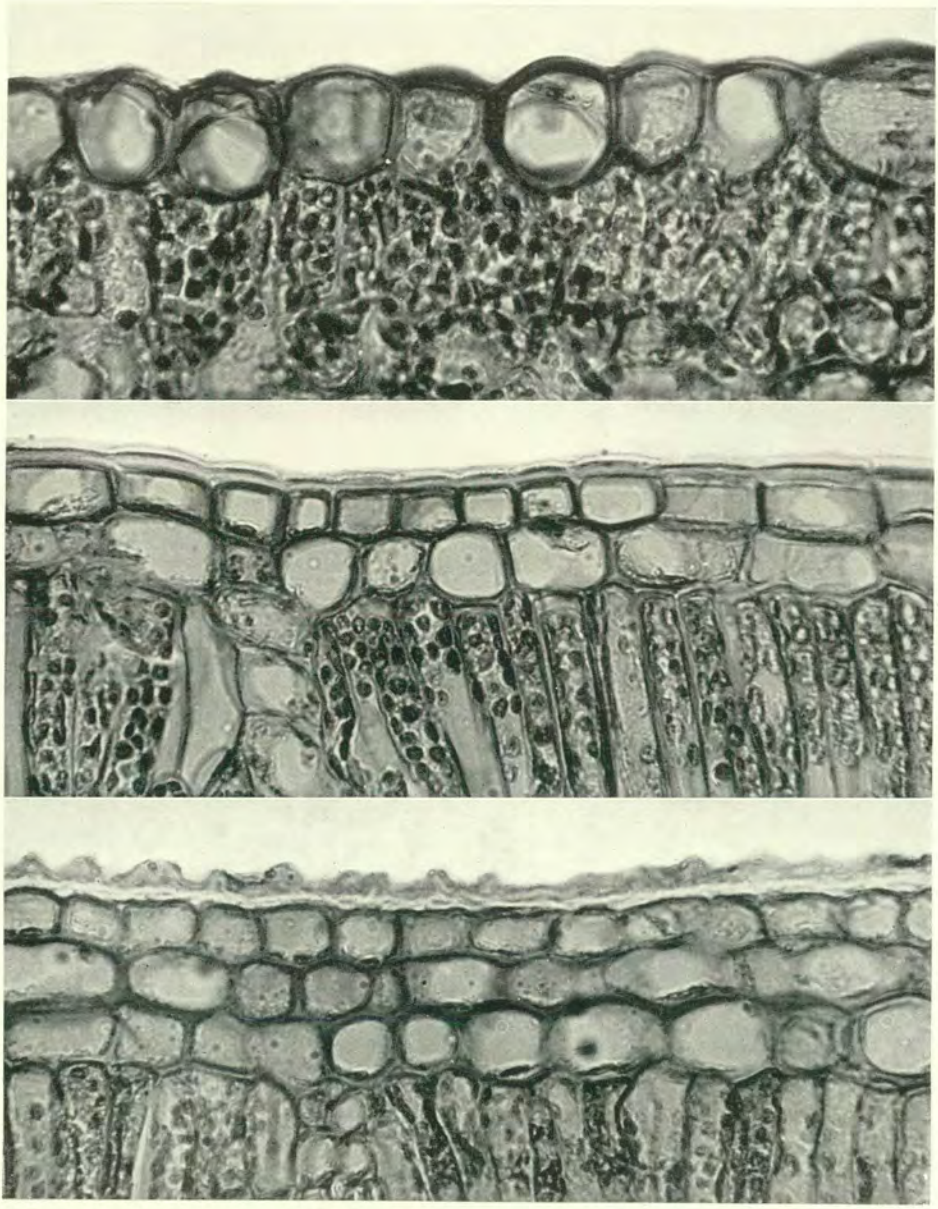

MAP
SHOWING
DISTRIBUTION
OF
THE GENUS
RHODODENDRON.
7
3
1
3
6
1
7
6
37
31
76
62
59
321
15
48
16
27
32
14
1
107
1
180
160
140
120
100
80
60
40
20
0
20
40
60
80
100
120
140
160
180

Fig. 8 (See p. 35)



*Photos, R. Eudall*

FIG. 9—Sections of Rhododendron leaves

(a) *R. obtusum* Planch. var. *Kaempferi* Wils. in which the epidermis consists of a single cell layer

(b) *R. charitopes* Balf. f. and Forrest in which the epidermis consists of a double cell layer

(c) *R. campanulatum* D. Don in which the epidermis consists of three cell layers

(See p. 42)

when the French Catholic Missionaries were collecting in China. Stationed in remote and lonely parts of Western China, in Szechuan and Yunnan and in the high mountains of the Yunnan-Szechuan-Tibet border, they spent their spare time collecting plants, and between them sent home a great mass of herbarium material to Paris, though they collected but little seed. Their names are familiar to us all through the Rhododendrons which Franchet named after them—*R. Delavayi, R. Davidii, R. Souliei, R. Fargesii* and so on.

About this time too a number of other collectors were working in China, among whom perhaps the best known is Dr. Augustine Henry, latterly Professor of Botany in Dublin, and joint author with Elwes of the classical work "The Trees of Great Britain." During periods of leave from duty as a Customs Officer he made extensive journeys to various parts of China and to Formosa, and his name is worthy of special mention for the blue-flowered Rhododendron called after him, *R. Augustinii* Hemsl., one of his many notable botanical discoveries.

To the Rhododendrons from China we must add to the mounting total others collected during this period in Japan and New Guinea, making a grand total of two hundred and eighty known species by the end of the nineteenth century.

The remaining species, more than six hundred of them, have all been discovered since the beginning of the present century.

This later period, from the year 1902 onwards, was one of unparalleled activity on the part of a number of now famous collectors whose work is so recent as to be generally well known—Wilson, Farrer, Rock, Forrest; also Kingdon-Ward and, more recently, Ludlow and Sherriff who are still in the field. "Nihil mortalibus arduum est; coelum ipsum petimus stultitia." In one decade alone, between 1910 and 1920, by their energy and efforts no less than three hundred and twelve new species were added to the genus—more than the total number that had been described from earliest times until 1900. The stories of their travels, their hardships and adventures have been told elsewhere. Let me just mention that Wilson made six separate journeys to the East between 1902 and 1918, visiting the island of Kurume in Japan and bringing home many of the now familiar Kurume Azaleas. Among the species he collected and introduced was *R. Williamsianum* Rehd. & Wils. which commemorates the late Mr. J. C. Williams of Caerhays who did so much to foster subsequent expeditions.

And between 1904 and 1932, when he died at Tengyuch, Forrest made seven expeditions to China, each of two or three years duration. His herbarium reached the grand total of over

thirty-one thousand dried specimens and of these no less than two hundred and sixty proved to be new Rhododendrons. It has been said that Forrest's contribution to the genus "is immortal, something more lasting than bronze." After his death his work was carried on for a time by his Chinese collectors who were employed by our President, Lord Aberconway, and, amongst other new species which they discovered, is the recently described *R. Aberconwayi* Cowan, which stood first in its class in the Rhododendron Show last year.

Kingdon-Ward continues his work of exploration and one of the most remarkable of his new species flowered for the first time in this country only a year or two ago. It is as yet, I believe, without a name; a plant allied to *R. giganteum* Forrest and to *R. magnificum* Ward.

The achievements of all these collectors has had no less consequence than the complete revolution of gardening in this country. Those who were fortunate enough to share in the proceeds of the various expeditions were overwhelmed. So many plants were raised from seed, they soon had to expand beyond their garden walls into the adjoining policies which gradually became woodland gardens on a grand scale. But the modern woodland garden is very different from the old-fashioned wild garden which was more or less of a wilderness, although it often had its charm. Now the gardener has turned artist, using his woodland as a wide canvas and his plants as brush and palette, and the wild garden has become a place where the choicest plants can be displayed and given room to grow freely as if at home in their natural surroundings.

All that has been said in this very brief outline of the growth of the genus may usefully be summed up in a diagram which shows the number of new species described in each ten year period from 1750 onwards. We see that the progress of our accumulating wealth has followed no even trend. It will be noted how the numbers rose when Hooker was collecting, and again as a result of exploration by the French missionaries; and how a peak was reached in 1910–20 when Wilson, Farrer, Forrest, Rock and Ward were all in the field, and that in this one decade alone three hundred and twelve new species were described (Fig. 7).

But we cannot leave this later period without some grateful reference to the work of the various botanists who have interested themselves in the genus—the late Sir Isaac Bayley Balfour, Sir William Wright Smith, Dr. A. Rehder, Dr. J. Hutchinson and the late Mr. H. F. Tagg. Forrest was particularly fortunate in having the encouragement of Sir Isaac Bayley Balfour and his close collaboration. Sir Isaac described many of the new species

which Forrest found and his work on the classification of the genus formed the basis of "The Species of Rhododendron" which is now the standard work.

Before this volume could be published an enormous amount of material had to be examined and arranged. The work which was carried out under the auspices of the Rhododendron Society was shared by the three institutions—the Arnold Arboretum and the Royal Botanic Gardens, Kew and Edinburgh. It was a great achievement and a distinct advance upon what had been done before, bringing a new and orderly arrangement to the many species which were in a state bordering upon chaos. Thus, they were grouped in forty-three natural associations or Series, with descriptions and analytical keys by which the identification of the species is greatly simplified. The recognized species now reach a total of eight hundred and fifty approximately.

The publication of "The Species of Rhododendron" in 1930 may be said to mark the end of an unparalleled period and the beginning of a new era in the history of Rhododendrons.

### 3. GEOGRAPHICAL DISTRIBUTION

I would turn now, for a moment, to consider the distribution of the species. This can be readily shown by means of a map from which it will be seen that the genus has a very wide distribution, mainly in the northern hemisphere. The numbers on the map indicate the number of species found in different regions. The great majority of Rhododendrons are natives of Western China and the adjoining parts of Burma and Japan; more than sixty species are found in the Himalayas; one in southern India; one in Ceylon; six occur in Asia Minor; four in Europe. The genus extends also into Malaya, Indo-China, the Dutch East Indies and the Philippines; to New Guinea, with one hundred and seven species; to the Solomon Islands and to Australia where a single species, *R. Lochae* F. Muell., occurs on Mount Bellenden Ker in Queensland. It spreads also into Eastern China, Japan and Formosa; a few species are subarctic; twenty-seven are indigenous in America, both in the East and West, seven in Western America, twenty in the East (Fig. 8).

Such then is very briefly the picture as it was in 1930 and the starting-point for more recent investigation.

### 4. THE 43 SERIES OF "THE SPECIES OF RHODODENDRON"

As we learn from Mr. J. B. Stevenson's introduction to "The Species of Rhododendron", if we wish to know something about

Rhododendrons, the best way to set about it is to get to know one representative species in each group or series—the others in the same series are more or less like it. This advice is sound, but for those who wish to follow it difficulties often arise. There is, to begin with, the trouble of obtaining suitable material to illustrate the characteristic features of each group. I have therefore, for the convenience of those to whom material is not readily accessible and who would wish to be reminded of what the outstanding features are, gathered together a number of typical drawings and illustrations of the different groups. The exhibition to which I would direct your attention embodies the ideas expressed in "The Species of Rhododendron," and modifications made since 1930 have, with intention, been disregarded. The pictures will exemplify to the eye each of the forty-three series and will help to clarify the system of classification which is founded upon the idea of a number of representative species. The illustrations are taken from various sources but many of them are the original work of Miss Watt, now Mrs. Bindon Blood, a former member of the staff at Edinburgh. They were mounted by Mr. Andrew Grierson, a student of Botany, and you will agree that he has completed his task in an effective and efficient manner. Mrs. Miller has also assisted in many ways in the preparation of the exhibition.

## 5. WHAT ARE THE CRITERIA FOR CLASSIFICATION?

*Resumé of the history—The 43 Series—No analytical key to the Series—The Series fall into three categories—Mixed assemblages—Aberrant species—An intractable residue—The search for new criteria—Genetics and cytology—Investigation of the leaf anatomy—The three types of epidermis—Investigation of the epidermal appendages; the wide diversity of structure of hairs and scales; the twenty-three trichome types; five types of scale; the importance of the trichome in taxonomy—Natural associations—Outstanding diagnostic criteria; presence or absence of scales; leaf ptyxis; types of seed; the epidermis; other major criteria—Further criteria; floral characters; vegetative characters; trichomes—Relative value of the criteria—Reassessment of the Series—Significance of new criteria—A tendency to further subdivision—The desirability of synthesis—A revised classification discussed.*

It is an obvious and recognized fact that the species of Rhododendron fall naturally into a number of associations of related species, but the botanists who from time to time have interested themselves in the classification of the genus are by no means in agreement as to how to interpret and to collate the observed facts. Their estimation of the scope, extent and standing of the associated groups varies according to differences of opinion among them. This dissentient tendency makes the history of the classification of the genus, from its very foundation by Linnaeus in 1753 to the publication of "The Species of Rhododendron" in

1930, a long and involved story. But there is no need to give more than a very brief summary here.

George Don, who was the first to divide the genus into sections, as long ago as 1834 listed and classified fifty-one species in eight sections (Gen. Syst. or Dictionary of Garden Plants, Vol. III, 843–8). After him came De Candolle with a somewhat different arrangement (Prod. Syst. Nat. Reg. Veg., Vol. VII, 719–728, 1838) and later Planchon (Azalées de l'Inde, Flore des Serres IX, 75–83, 1853–4) and then Maximowicz (Rhod. of Eastern Asia, Mem. Acad. Imp. Sc. St. Petersb., Vol. XVI, No. 9, 1871, 1870) who added to and modified the subdivisions of the earlier works.

Another systematic grouping was followed in Genera Plantarum by Bentham & Hooker (Vol. II, 599–602, 1873–6) again revised and supplemented by C. B. Clarke in the Flora of British India (Vol. III, 462–75, 1882) and by Franchet (Bull. Soc. Bot. Fr. XXXIII, 227–36, 1886). Next thereafter came the proposals of Rehder and Wilson (Plantae Wilsonianae, Vol. I, 503–49, 1913), modified and amended by Rehder in "Manual of Cultivated Trees and Shrubs" in 1927. The monograph on Azaleas was published in 1921. Meanwhile, between 1916 and 1920 a series of papers had appeared in the Notes from the Royal Botanic Garden, Edinburgh and in the Transactions of the Botanical Society, Edinburgh, by Sir Isaac Bayley Balfour and Sir William Wright Smith working in conjunction with Forrest and Kingdon Ward, and one by Dr. J. Hutchinson on species related to *R. Maddenii* Hook. f. (1920).

The various subdivisions adopted in all these works neither exactly coincide nor correspond, they often overlap; and some species have steered a most intricate course in their history, moving from one subdivision to another. The many authors often use the same terms but not with the same status or significance—subgenera and sections, subsections, series and subseries—and some botanists have gone so far as to split up the genus into a number of separate genera. The authors of "The Species of Rhododendron" took an independent view. After previously publishing a number of "Tentative Lists" (1925, 1927, 1929 and 1930), they adopted an arrangement based on a fairly general agreement, tentative as some of the conclusions were. These little lists, insignificant in appearance, were for a number of years carried about and used by Rhododendrophiles and had an effect quite out of proportion to their size, for they clarified proposals as to grouping and led on to the publication of the book which obtained universal approval.

The final arrangement of the species in forty-three series (with a number of subseries), a much larger number of subdivisions than had been suggested earlier, has much to commend

it, and if the user of the book is familiar with representative species of these forty-three series, a great part of his difficulty in the naming of Rhododendrons is solved. None the less, the introduction continues the warning that "the arrangement is essentially tentative," thus, "lines of demarcation between one series and the next are sometimes definite, but in other cases very difficult to draw," and that the "validity of each series should be considered an open question." Is this caution called for? The question is answered in using the book.

It is my experience that, when the series to which a plant one wishes to name is known by headmark, its identification is comparatively easy, but one has to name many plants whose series are not immediately apparent and to discover by a process of trial and error in which series they have been placed may occupy an unreasonable time.

It will be observed that while concise analytical keys have been given for the species, no such key is provided for the series themselves and this is essential to the completion of the work. The characters which distinguish the series (and subseries) are set out in introductory paragraphs which precede the keys to the species and descriptions, but I find in practice that, even with the detailed information given, it is often not easy and sometimes impossible to determine with any certainty into which series a particular plant should fall.

We may wonder why no key to the series was provided. The reason is that, although it might seem to be a simple and mechanical matter to draw up such a key, its preparation is beset with numerous and unexpected pitfalls; indeed the truth is that some of the series are so heterogeneous that it is not possible to prepare a concise and satisfactory key to them as they are now constituted. Let me take one simple example which will explain why this is so. The Fortunei Series is distinguished by two main characteristics—glabrous leaves and a 7-lobed corolla, as in *R. decorum* Fr. This appears to be a clear-cut and easy distinction, but, if we look more closely we discover that one member of the series, *R. Griffithianum* Wight, has a 5-lobed corolla, while in the Irroratum Series, also with glabrous leaves, at least one species, *R. eritimum* Balf. f. & W. W. Sm., has a 7-lobed corolla. In other words, if we rely upon short and simple criteria, the distinctions between the series break down. The example given is no isolated instance. On the contrary, in almost every series species are included which do not fit the general pattern. Furthermore, many of the criteria used in the diagnoses of the series are such as permit of no clear-cut line of demarcation; they are by their very nature vague—distinctions for example such as truss

compact or loose, leaves more or less rounded. To the use of such criteria there may be no alternative—"lines of demarcation are difficult to draw"—but since the criteria are often indefinite, and because the number of aberrant species is large, the making of a key is fraught with difficulties: if accurate it becomes too cumbersome, if concise too inaccurate to be of much practical use. But the foregoing remarks do not apply to all the series with equal force and are made with no intention of detracting from the merits of the work. The classification in "The Species of Rhododendron" is based upon sound principles; it marked an important step forward, and the arrangement therein is probably the best that could be devised with the then available characters, even if they do not afford a complete clue to the series. It should be emphasized that it is only a few admittedly 'mixed assemblages' doing duty for unified series that upset the classification and cause trouble in preparing a key; take one example, the Ponticum Series, a heterogeneous collection of species, held together by one rather indefinite character, a candelabroid truss.

Considering the forty-three series as a whole, I find that they group themselves in three distinct categories:

FIRST: *Series which are homogeneous.* The series are well defined by clear-cut diagnostic criteria. The species can readily be assigned to their series. Such series are few.

SECOND: *Series which overlap.* The series are defined by variable diagnostic criteria and are without clear-cut lines of delimitation, but none the less easily recognized; numerous aberrant species however lack the characteristic features. The majority of series come into this category.

THIRD: *Series which are heterogeneous.* Mixed assemblages held together by rather indefinite characters. Such series are few.

It is apparent therefore that the immediate problems are—to examine critically and to sort out the series in category three, which are still confused assemblages, and to seek for further and more definite criteria for those series (in both categories two and three) which are still imperfectly delimited—with the preparation of a key to the series as the ultimate aim. But the problems are many and they are complex. I have been working upon them for a considerable number of years (except for the war period when all work on Rhododendrons had to be set aside) and, although progress has been made, much remains still to be done.

With regard to the so-called 'mixed assemblages,' some of the

lepidote series have already been revised by Mr. H. H. Davidian and myself, and we are at present endeavouring to clarify some of the elepidote series. This is the more difficult because, as will be generally agreed, there has been a tendency to an undue multiplicity of specific names, and superfluous names must be eliminated at the same time.

As to the clearer delimitation of the series, long ago I came to the conclusion that without new criteria the arrangement probably could not be greatly improved. The publication of "The Species of Rhododendron" marked an important stage in the elucidation of the genus and it will serve no useful purpose to look for other criteria for those series which we all recognize as easily discriminated; but we all realize the problem of an intractable residue, and the point here is to tackle those series which we agree cannot readily be diagnosed. Nature does not always permit herself easily to be constrained within the bounds of the framework of any formulated plan, and most of the difficulties still to be surmounted are brought about by the complexities of Nature herself. We have to do our best to master them.

To this end useful information might perhaps be gained from other branches of the science now impacting upon taxonomy. Writers in the field of plant genetics and cytology, comparative anatomy, experimental taxonomy and floral morphology have been able to offer criteria of great value to the taxonomist. Indeed, all the recent history of taxonomy points to the importance of minutiae. Chromosomes, pollen grains, leaf anatomy, stomata, wood elements and epidermal hairs, for example, have been relied upon in different genera with important results—chromosomes in Primula and other genera, pollen grains in the Acanthaceae, leaf anatomy in Digitalis, stomata in Conifers, wood anatomy in the Rosaceae and Theaceae, and epidermal hairs in Styrax.

Can any such characters be effective as a means of dispelling, not all perhaps, but a great deal of the confusion in Rhododendrons which we all agree exists? So far very little use has been made of such minute characters in relation to Rhododendrons, and the further investigation of these structures, which at first sight might be regarded as insignificant, may yet prove to be of decided value.

But genetics and cytology which have been so great an aid in other genera, have here, as far as we know at present, no help to give us—chromosome analysis is no sure guide to affinity in all genera. In Rhododendrons the chromosomes have a very stable genetic constitution. Sax, who investigated them, in his paper "Chromosome Stability in the Genus Rhododendron" (Amer.

Journ. Bot. XVII. 247, 1930), remarks that: "Considering the great variation and geographic range of Rhododendron species it is surprising to find the chromosome number so constant." "Counts of representative species show that 13 is the fundamental chromosome number and this is found both in true Rhododendrons and in the Azaleas [and even in hybrids]. Two tetraploid species were found [*R. calendulaceum* (Michx.) Torrey and *R. canadense* (L.) Torrey] but tetraploidy is not characteristic of any one group or section." Subsequent investigation by Nakamura and the recording of a number of polyploid species by Dr. Janaki Ammal has not upset his final conclusion that: "Although the genus is very polymorphic the chromosome numbers of representative species are very uniform."

Again, in their pollen grains, stomata and wood anatomy, Rhododendrons, as far as we know, are very similar throughout and further investigation in these directions seemed to hold out only poor prospects of further progress. On the other hand, there was evidence to show that a study of the anatomy of the leaf and particularly of the epidermal appendages might offer a good chance of success. That these would be the more hopeful lines of enquiry was suggested by independent investigations carried out and recorded as long ago as 1885 by Julien Vesque and in 1888 by Alex. Breitfeld. Vesque's paper was a general one (Caractères des Principales Familles Gamopétales, tirés de l'anatomie de la feuille, Ann. Sci. Nat. Ser. VII. Vol. I, 238–40) but in his chapter on the Ericaceae he draws up a key to eighteen species of Rhododendron, which is based entirely upon anatomical characters and the epidermal appendages of the leaf.

Breitfeld's paper deals specifically with Rhododendrons and is therefore, from our point of view, more detailed and complete. It is entitled "The Anatomical Structure of the leaves of Rhododendrons in relation to their Systematic grouping and their Geographical Distribution" (Der anatomische Bau der Blätter der Rhododendroideae in Beziehung zu ihrer systematischen Gruppierung und ihrer geographischen Verbreitung. Bot. Jahrb. IX. 319–79, 1888). The striking fact is that both these authors were able to distinguish clearly between various groups of allied species on the evidence only of the anatomical structure of the leaf and of leaf appendages of various types.

Before the war, realizing the importance of the epidermal appendages in the taxonomy of the genus, I had begun a general survey of Rhododendron hairs and scales. This has now been completed and a full account of this work will shortly be published as a book. I had hoped that it would have been available for this conference, but because of publisher's difficulties it

has been delayed. The leaf anatomy is now being studied at Edinburgh by Mr. S. F. Hayes who has already examined more than four hundred species.

Let us take first the question of the Anatomy of the Leaf and consider afterwards the Hairs and Scales. As an initial step, in order to ascertain what differences in leaf structure should be looked for in Rhododendrons, sections of the leaves of a number of representative species were prepared and examined. The differences which were observed proved to be almost the same as those that had been already recorded by Vesque and by Breitfeld. They were as follows—variation in the thickness of the cuticle; variation in the number of cell layers of the epidermis (taken to include the hypodermis); variation in the size of the cells in each of the epidermal layers; variation in the depth of the palisade tissue in relation to the total thickness of the leaf; variation in the extent of the thick-walled or sclerenchymatous tissue in the region of the midrib, and in connection with the secondary veins; variation also as to the presence or absence of stone cells or 'sclereids.'

We were looking for characters which would be of practical use to the working systematist, easily discernible under the low power of the microscope in sections cut by hand. In course of time it became manifest that several of those characters, which are noted above, must be rejected on the grounds that they do not meet these requirements. Others were presently rejected either because they are not constant even in a single species, let alone a species group, or because they are too indeterminate to afford clear-cut lines of demarcation. Vesque and Breitfeld had made use of every one of those differences but they had a much simpler problem, dealing with a few species.

In short, a preliminary survey served to show that only one of those varying features, namely the number of cell layers in the epidermis, was likely to be of value over the whole genus, especially at series or subseries level, although some others might have a certain significance of a subordinate kind.

It was seen that, according to diversity of leaf structure, Rhododendrons come into one of the following three groups (Fig. 9):

(a) The leaf epidermis consists of a single cell layer as in *R. obtusum* Planch.

(b) The leaf epidermis consists of a double cell layer as in *R. charitopes* Balf. f. & Forrest.

(c) The leaf epidermis consists of three or more cell layers as in *R. campanulatum* D. Don.

or, for the sake of brevity, the epidermis is (a) Single, (b) Double or (c) Treble. These facts having been established, a large

number of species, representative of every series, was examined from this point of view.

Although the investigation is not yet complete, it now seems likely that this character will not greatly aid in the broad classification of the genus. It may, however, prove to be a most useful supporting character, especially in determining the status of various subseries, and it may be of considerable value also in the sorting out of 'aberrant' species. Some curious facts have, however, already emerged. Members of the Vaccinioides Series, which are homogeneous, with a single epidermis, are also unique in the structure of the epidermis. The Azaleas, the series more nearly related to them, and indeed all deciduous species which have been examined, have, as might be surmised, a single epidermis. Most evergreen Rhododendrons have, on the contrary, either a double or a treble epidermis. But to the general rule there are notable exceptions. For example, members of the Lapponicum and Lepidotum Series (but not the Saluenense Series) have, surprisingly, a single epidermis. It was noted further that various modifications of the classification suggested or already carried into effect are strongly supported by the evidence which the leaf anatomy affords. But no true assessment of the value of the leaf anatomy as a diagnostic character can be given as yet since the examination of the species is still in progress. I hope, however, when Mr. Hayes has completed his survey and written an account of his work on the anatomical side, to review it in collaboration with him from the point of view of the taxonomy.

Let us now turn to discuss the minute structure of the indumentum. It is well known that variety of indumentum is one of the noteworthy features of Rhododendrons, that we have but to turn over a leaf and examine the under side to learn something of the relationship of the species to which it belongs. Very full use is made of the indumentum as a criterion of distinction in "The Species of Rhododendron." But when full value has been given to its more obvious features, we are still left with a large residue of species whose true taxonomic position is a matter of doubt.

What aid is the minute structure of the indumentum likely to afford ?

It has long been known that the genus Rhododendron can be divided into two large sections—lepidote and elepidote—according to the presence or absence of scales on the under side of the leaf (Figs. 10, 11). It was known that the Falconeri Series, easily separable from all other Rhododendrons, except the Grande Series, by floral and leaf characters, is a series unique in its hairs.

A single hair examined under the microscope is a funnel or cup-shaped structure made up of a network of cells. In different species the shape of the cup or funnel varies, sometimes it is fringed, sometimes not, but in every species of the series the general pattern is the same and in no other group of Rhododendrons is this type of hair to be found.

Members of the Parishii Series are easily recognized by the presence of stellate hairs seen when a leaf is examined with the aid of a pocket lens.

No one can fail to recognize *R. Hookeri* Nutt. because of the little dot-like tufts prominent at intervals all along the veins, visible even to the naked eye.

Under the low power of a microscope the hair of *R. Trailliianum* Forrest & W. W. Sm., a cluster of pear-shaped cells, distinguishes it at once from every other Rhododendron.

All these facts were known when I decided it was worth while to investigate further. Besides, Breitfeld, in the paper to which I have already referred, had described a number of distinctive types of hair on different species he had examined. Sir Isaac Bayley Balfour had noted the presence of a bistrate or two-layered indumentum in various species.

The field for further research was obviously a wide one, and one which offered at least some chance of progress. Accordingly I began to investigate first the more obvious series, then I turned my attention to the mixed assemblages and finally I examined and re-examined most of the species in every series.

The result was to disclose a diversity of structure far greater than might have been expected. Indeed, when all the species had been examined, there was some difficulty in deciding how many distinctive types of epidermal appendage should be recognized.

I found, as with other criteria, that there is, in certain instances, a tendency for one type of appendage to merge into another.

In the end, however, I was able to describe and affirm twenty-three main types which occur in the genus. Perhaps the most unexpected discovery was the fact that Rhododendron scales, which had previously been regarded as homogeneous structures, are by no means so; five distinct types can be recognised among the scales alone. The peg-like projections or papillae seen on so many Rhododendron leaves constitute another distinctive type. The remaining seventeen types represent different forms of hair. As a general name to include them all, papillae, hairs and scales, I have adopted the term 'trichome.' Each type of trichome will be illustrated and described in detail in the forthcoming publication to which I have referred. One chapter gives an account of the

different types of trichome in each series. The part the trichome may play in the taxonomy of the genus is fully discussed in another.

In general, the trichome type is very constant in some series, but a very considerable admixture of types is exhibited in others. Furthermore, it is in those very series that are acknowledged to be 'mixed assemblages' that the lack of uniformity is most pronounced.

In some series the trichome is characteristic, but in other instances trichomes are common to several series. Some types are too generally dispersed to have any important taxonomic significance, others are completely diagnostic for a group of series or for a single series, others for a group of species or a single species. Furthermore, it is not unusual for more than one type of trichome to be found on a leaf and sometimes a combination of types is significant.

Here then we have a set of new criteria which will undoubtedly prove helpful in delimiting the series, in sorting out confused assemblages and in eliminating aberrant species.

The question is, how far can similarity of trichome be taken as a true indication of relationship? We have seen that certain series are consistent as to trichome type: can we assume that species with different types of trichomes, which are now in the same series, are not closely related and should not therefore be in the same series; and conversely that species now in different series but with the same trichome type should be united and should together form a series or subseries or a related group? This question has still to be fully explored and the answer will probably be sometimes in the affirmative, sometimes in the negative, with a certain bias in favour of the affirmative. The taxonomic position of a species or group of species is determined by a great number of characters which must all be considered and given due weight before a decision as to status and relationship is made. It is unsafe to assume that relationship can be established by any one character, such as the trichome type, alone.

For this reason I have made no attempt, as part of my investigation of the trichome, to amend the classification of the genus, because when concentrating upon one particular character, it is scarcely possible to avoid the danger of laying too great stress upon it.

It would seem, however, that in the trichome we have a character which will be of considerable aid in attaining our ultimate purpose—a key to series; and it is clear that we have here an important criterion, one which botanists regard as a strong character and which ought to be given its full significance

in the classification of the genus Rhododendron as it has been given in many other genera. I make no claim that we have here a factor that is in itself a complete solution to all our problems, or that it is one which can be universally used, but it is one that will at least take us some way towards the goal at which we aim.

The task that now lies before us, and in which I am at present engaged, is the reassessment of the series, taking all available criteria into consideration, in the light of the newer information we have gained.

Natural associations, as we find them, follow no regular mould or pattern. Nature in her organization is infinitely complex. The characteristics which should be used to judge of affinity and inter-relationship change from group to group and can only be determined after close examination of a wide range of material, and every part of the plant must be subjected to careful scrutiny.

The remarks made by Sir William Wright Smith in his Masters Lectures are much to the point: "It is incumbent on every systematist seeking to unravel the tangled skein of affinity to challenge the validity of many of his criteria in the expectation that he may come near the ideal of a truly natural arrangement." (Problems of Classification, Masters Lectures, Jour. Roy. Hort. Soc., Vol. LXI. 77–90, 117–34, 1936).

Let us, therefore, having examined the material, review the more outstanding characters which have played their part in the classification of the genus and upon which any systematic arrangement must depend. They are the standards by which we judge of status and inter-relationship and the evidence upon which we rely for the recognition and delimitation of natural groups.

Take first one character which, as we have seen, permits us to subdivide the genus into large sections approximately equal in size—the presence or absence of scales. Characters with so wide an application are few.

The presence of scales is usually readily detected without the aid of a lens, except in the case of species of the Edgeworthii Series where the underlying scales are concealed by a covering of hairs. Excluding these, all species with a hairy indumentum and with glabrous leaves are elepidote. Of the forty-three series, nineteen series with four hundred and thirty-three species are elepidote, twenty-four series with three hundred species are lepidote (species not actually listed in series are excluded from this count).

One other character runs parallel to the one just mentioned, the folding of the leaf in the bud known as the vernation or ptyxis of the leaf. This was the subject of a paper by Mr. J. Sinclair

(Notes Roy. Bot. Gard. Edin., Vol. XIX. 267–271, 1937), who showed that two types of bud construction can be recognized, the one revolute with the young foliage leaves rolled outwards, the other convolute with the young leaves rolled inwards. In the revolute type the bud scales form a chamber which encloses the young leaves; the outer bud scales, which form the wall of the chamber, are themselves convolute, but the young leaves, which arise from the base of the chamber are revolute. In the convolute type both bud scales and foliage leaves are convolute and there is no marked differentiation between the last bud scale and the first foliage leaf (Fig. 12).

The young foliage leaves of all elepidote species are revolute while those of lepidote species are convolute. To this general rule one species, and one species only, is an exception viz. *R. pendulum* Hook. f. of the Edgeworthii Series, in which the young leaves are revolute; other species of this series conform to the rule, being in the convolute class.

For an initial subdivision of the genus into large sections we have another available criterion in the form and constitution of the seed, by which we are enabled to distinguish two or perhaps three distinct groups. Kingdon-Ward, who has made a special study of the seeds of Rhododendrons (Journ. Bot., 241–247, 1935, and Rhod. Year Book, 100–114, 1947) distinguishes the following types:

(a) *Seed winged.* Seed flattened with a wing all round, sometimes very narrow laterally, but then expanded at the ends.

(b) *Seed angular or rounded without wings and without tails.*

(c) *Seed spindleshaped or fusiform with very long tails at each end.*

This division of the genus, it should be noted, is not in accordance with the division into lepidote and elepidote, nor can any difference in seed be correlated with glabrous or hairy leaves.

I agree with Ward as to the three main categories—'winged,' 'wingless and tailless,' and 'tailed'—although it is difficult to distinguish between 'winged' and 'wingless' since there is every gradation between them. I would, however, venture to dispute his distribution of the species under the three heads. In my view, he includes among species with tails in class three, a number of series which are winged and should properly be placed in class one. In short, I prefer to adhere to the original description of tailed seed and not to widen the interpretation as Ward has done.

That the seeds of certain Rhododendrons are furnished with

long tails was observed as long ago as 1825. Indeed, so impressed was Blume with this distinction, that when he described *R. javanicum* (Bl.) Benn., he made for it a new genus, *Vireya*, which comprised *V. javanica* with other Javanese species (Blume, Bijdragen tot de Flora van Nederlandsch Indië, Batavia 1825).

C. B. Clarke in the Flora of British India (Vol. III. 462–74, 1882), when classifying the genus Rhododendron, divided it into four subgenera with strong emphasis upon differences in seed:

1. *Vireya*—Seeds very long-tailed at both ends, the tails many times longer than the seed . . ., with five species from Malaya and the Dutch East Indies, and 2. *Pseudovireya*—with the characters of *Vireya* (but valves of the capsule recurved, not twisting after dehiscence) with one species, *R. vaccinioides* Hook. f. from the Sikkim Himalaya. The long-tailed seeds of this species are beautifully shown in the figure (p. 825) of "The Species of Rhodoɒdendron."

3. *Eurhododendron*—Seeds without tails or tails shorter than the seed, with thirty-six species, and 4. *Rhodorastrum*—Seeds as in Eurhododendron, with one species, *R. virgatum* Hook. f.

The distinction here is between 'tails' (Javanese species and *R. vaccinioides* Hook. f.) and 'no tails' (all other Rhododendrons), no line is drawn between winged and wingless. Now the difference between the first two subgenera with tailed seeds and the other two without tails is a very marked one.

But Ward transfers species of the subgenus Rhodorastrum and many species of Eurhododendron to the 'tailed' class, and it is from this interpretation that I dissent. These species have winged seeds, admittedly they are narrowly winged, and they have a short extension of the wing at each end which might be regarded as a short tail, but these are not seeds with tails (4–6 times as long as the seed) as in *R. vaccinioides* Hook. f. where, moreover the seed is not even narrowly winged (Fig. 13 (i)).

A glance at the figures with which Ward illustrates his earlier paper will make my point clear. We are agreed that Fig. 15 (a) represents seeds of the winged type, and Fig. 15 (c) seeds of the wingless and tailless type, and Fig. 15 (b) (iv) the tailed type. We disagree about Figs. 15 (b) (i) *R. virgatum* Hook. f., (ii) *R. taronense* Hutch. and (iii) *R. micromeres* Tagg. I prefer to regard these as winged seeds (a rather narrow winged form), not as tailed seeds, a view which I consider is justified merely on the evidence of Ward's own figures. Compare Fig. 15 (a) (iv) *R. Thomsonii* Hook. f.

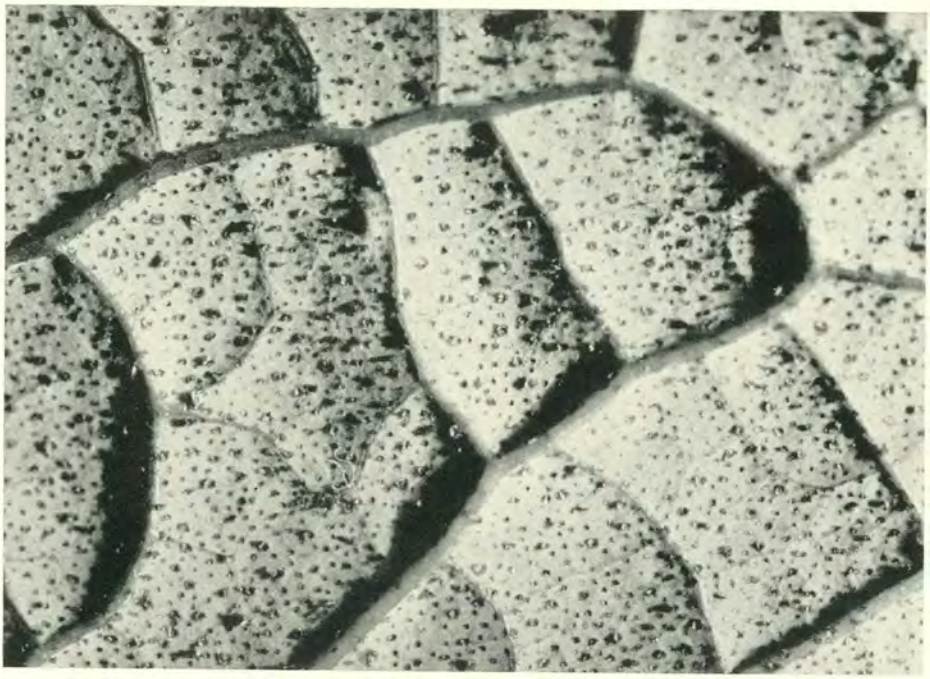


FIG. 10—The underside of the leaf of a lepidote Rhododendron (*R. Nuttallii* Booth), magnified eight times

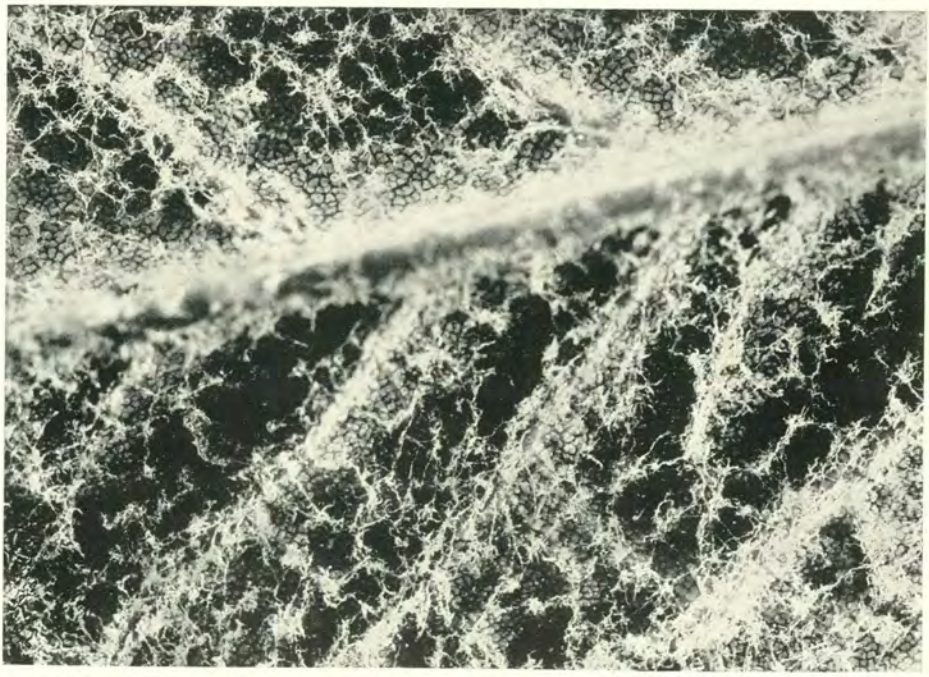


FIG. 11—The underside of the leaf of an elepidote Rhododendron with hairs (*R. barbatum* Wall), magnified eight times (See p. 43)

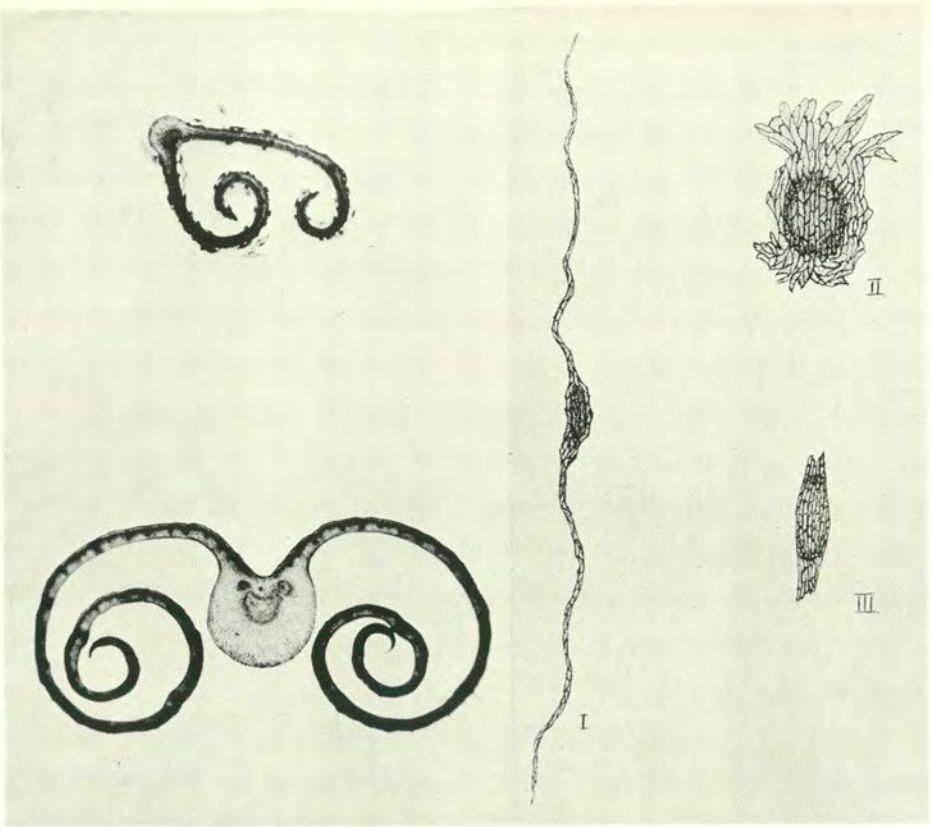



FIG. 12—Types of bud construction: Young foliage leaves rolled inwards (*R. venatum* Tagg.); rolled outwards (*R. Maddenii* Hk. f.) (See p. 47)

FIG. 13—Types of seed

(i) Seeds with very long tails (*R. vaccinoides* Hk. f.)
(ii) Seeds winged (*R. Falconeri* Hk. f.)
(iii) Seeds without wings and without tails (*R. campylogynum* Franch.) (See p. 48)

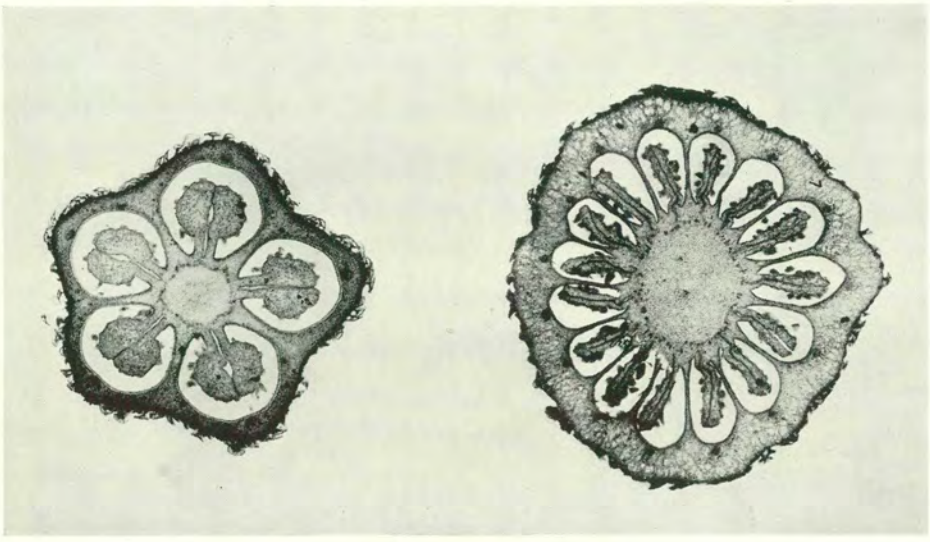


FIG. 14—Rhododendron Ovaries

(a) The 5-celled ovary of *R. Dalhousiae* Hk. f.
(b) The 15-celled ovary of *R. Maddenii* Hk. f. (See p. 50)

RHODODENDRON SEEDS. By F. Kingdon-Ward (See pp. 48, 49)

(Excerpt reproduced by kind permission from *The Journal of Botany*, 1935)

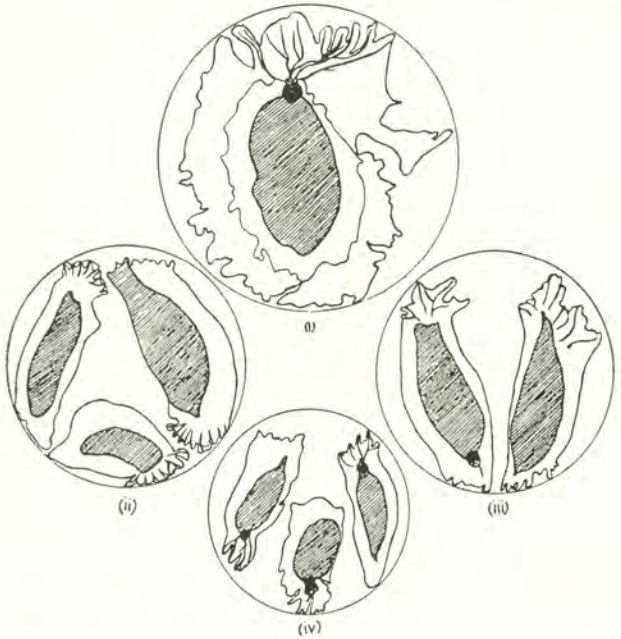



Fig. 15(a). Forest type. Seed flattened, with all-round wing, sometimes expanded at the ends, less than three times as long as broad. (i.) *R. magnificum* sp. nov. A forest tree, sometimes gregarious. (ii.) *R. arizelum* Balf. f. & Forrest. A gregarious gnarled tree, forest zone. (iii.) *R. Beesianum* Diels. A gregarious small tree, or large shrub, from the forest line, 12,000 feet. (iv.) *R. Thomsonii* Hook. f. A large forest shrub. All × 8.


Fig. 15(b). Epiphytic type. Seed spindle-shaped or fusiform, from 4 to 6 times as long as broad, the ends drawn out into tails, not expanded. (i.) *R. virgatum* Hook. f. Common on rocks and cliffs in the forest belt. Not on trees. (ii.) *R. taronense* Hutch. Epiphytic in hill jungle, rarely on rocks, 6,000 feet. (iii.) *R. micromeres* Tagg. Always epiphytic in temperate rain-forest. (iv.) *R. vaccinioides* Hook. f. Always epiphytic in temperate rain-forest. An extreme development of the epiphytic type. All × 8.

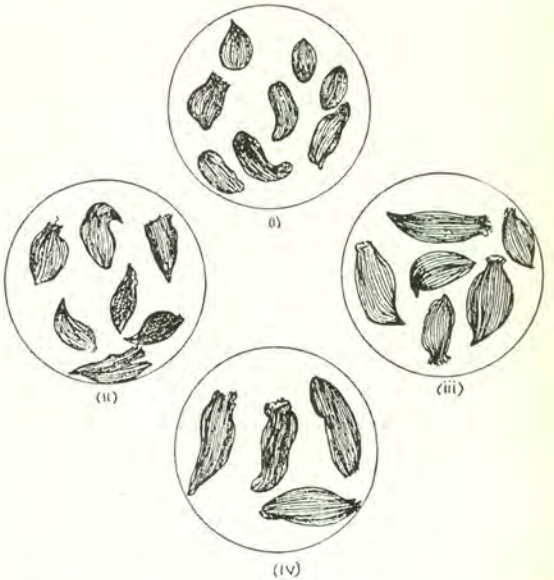



Fig. 15(c). Alpine type. Seed rounded or angular, without wing or end tails. (i.) *R. campylogynum* Franch. A gregarious alpine undershrub from 14,000 feet. (ii.) *R. tephropeplum* Balf. f. & Farrer. A gregarious shrub, from the subalpine region and forest line, 10,000–11,000 feet. (iii.) *R. racemosum* Franch. A gregarious semi-alpine undershrub. (iv.) *R. hippophaeoides* Balf. f. & W. W. Sm. A gregarious undershrub, alpine moorland. All × 8.

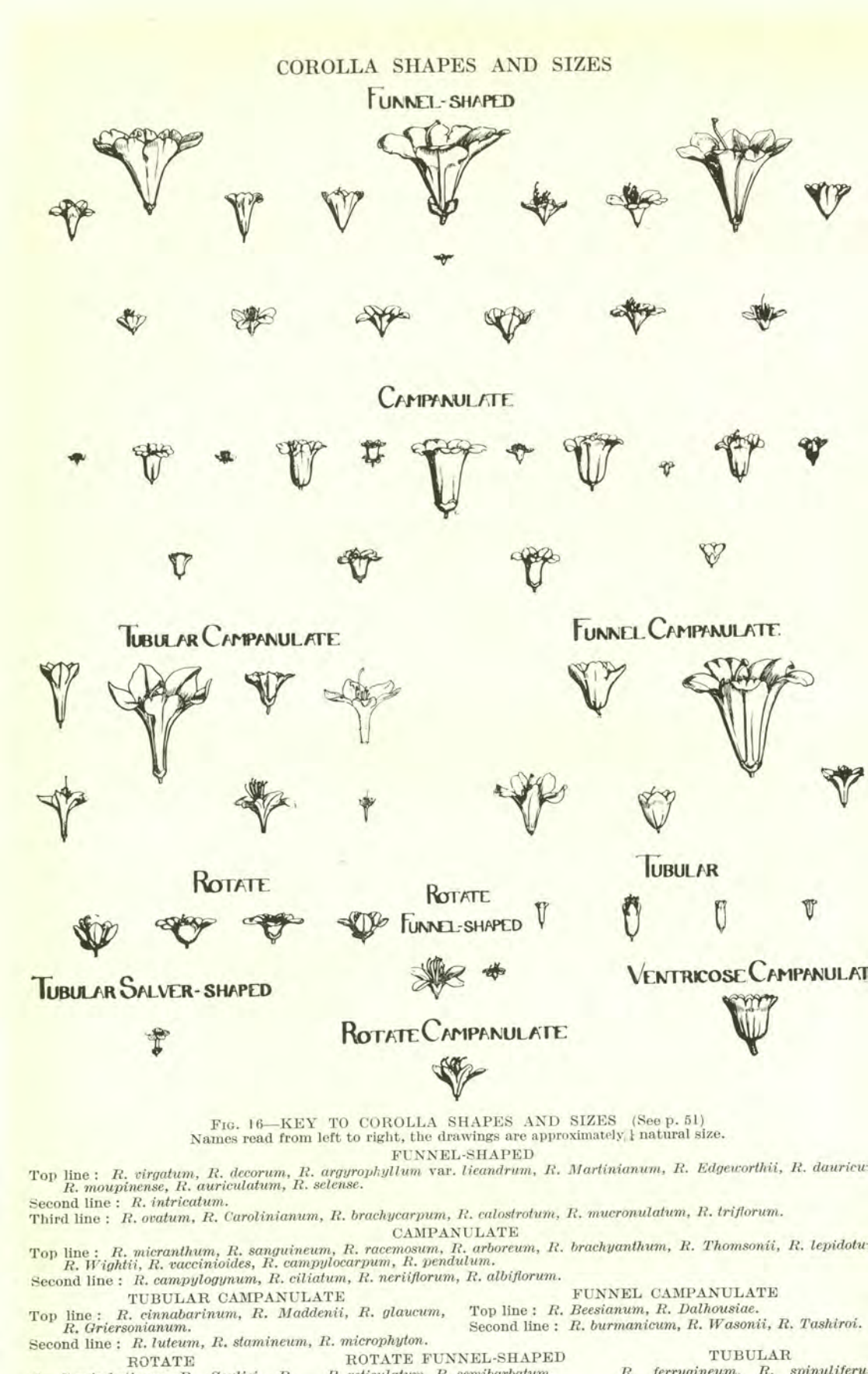



FIG. 16—KEY TO COROLLA SHAPES AND SIZES (See p. 51)
Names read from left to right, the drawings are approximately ½ natural size.

FUNNEL-SHAPED

Top line : *R. virgatum, R. decorum, R. argyrophyllum* var. *licandrum, R. Martinianum, R. Edgeworthii, R. dauricu*
*R. moupinense, R. auriculatum, R. selense.*
Second line : *R. intricatum.*
Third line : *R. ovatum, R. Carolinianum, R. brachycarpum, R. calostrotum, R. mucronulatum, R. triflorum.*

CAMPANULATE

Top line : *R. micranthum, R. sanguineum, R. racemosum, R. arboreum, R. brachyanthum, R. Thomsonii, R. lepidotu*
*R. Wightii, R. vaccinioides, R. campylocarpum, R. pendulum.*
Second line : *R. campylogynum, R. ciliatum, R. neriiflorum, R. albiflorum.*

TUBULAR CAMPANULATE

Top line : *R. cinnabarinum, R. Maddenii, R. glaucum,*
*R. Griersonianum.*
Second line : *R. luteum, R. stamineum, R. microphyton.*

FUNNEL CAMPANULATE

Top line : *R. Beesianum, R. Dalhousiae.*
Second line : *R. burmanicum, R. Wasonii, R. Tashiroi.*

ROTATE

*R. Camtschaticum, R. Souliei, R.*
*Boothii, R. trichocladum.*

ROTATE FUNNEL-SHAPED

*R. reticulatum, R. semibarbatum.*

TUBULAR

*R. ferrugineum, R. spinuliferu*
*R. Keysii, R. nipponicum.*

TUBULAR SALVER-SHAPED

*R. anthopogon.*

ROTATE CAMPANULATE

*R. Vaseyi.*

VENTRICOSE CAMPANULATI

*R. basilicum.*

(winged) and Fig. 15 (b) (ii) *R. taronense* Hutch. said to be tailed. Both are winged and in the latter the wings are only slightly narrower.

Though I do not claim to have studied this aspect of the genus as thoroughly as has Ward, I have examined a large number of seeds and I find it difficult in practice to draw any line of demarcation between winged and wingless seeds or what Ward calls his 'epiphyte' and 'forest' types. There is, to say the least, much less dubiety when the line is drawn as in the Flora of British India—between tails and tailless. I have only examined a few Javanese species; some have seeds which are winged but others, e.g. *R. Schadenbergii* Warb., *R. Nortoniae* Merrill, and *R. loranthifolium* Sleum., have 'tailed' seeds similar to those of *R. vaccinioides* Hook. f.

Still another character is available for a major subdivision of the genus, the one to which we have already referred, namely the number of cell layers in the epidermis; but it would be premature to discuss this further at this stage.

Next we have to take notice of several characteristics which are applicable only to a small number of species, but which at one time or another have been regarded as important enough in themselves to denote a number of primary subdivisions of the genus.

To the rule that in most Rhododendrons the flowers are borne in special buds—the floral buds are terminal on the shoot of the previous year and the flowers are borne in terminal umbels—there are a number of exceptions.

*R. camtschaticum* Pallas and the other allied species of the series have flowers which, instead of arising from special buds and forming an umbellate truss, are borne singly at the end of the young leafy shoots of the current year. So different are these species from other Rhododendrons that, from time to time, they have been taken to constitute a separate genus, Therorhodion.

Again, certain other species instead of having a terminal truss have a diffused or multiple inflorescence; the floral buds are scattered all along the branches. These Rhododendrons are so different from others that they also, by some systematists, have been regarded as forming distinct genera. This class comprises two groups. The one embraces the elepidote series Stamineum, Semibarbatum and Albiflorum—at times placed either in separate sections or subgenera—Choniastrum or Azaleastrum—or given generic rank as has seemed most appropriate to various authors. The corresponding group among lepidote Rhododendrons includes species in three series also, the Virgatum and Ovatum Series, and *R. Keysii* in the Cinnabarinum Series—now and then placed under the name Rhodorastrum. It may be

added, however, that some species of the Triflorum Series also have a multiple inflorescence.

Along with these exceptional species we may refer also to the Azaleas. The genus Azalea was established by Linnaeus, but it was included in Rhododendron by G. Don; later the name was sometimes retained, sometimes suppressed and sometimes (e.g. in Rehder & Wilson's Monograph) the name Anthodendron, proposed by Reichenbach in 1827, has been used to denote the Azaleas. Recently, of course, Azaleas have been included in the genus Rhododendron but they constitute a fairly well-defined group.

Floral characters which we may consider next are ordinarily of the greatest importance in classification, and Rhododendrons are remarkably diversified in this respect.

For the purposes of classification this diversity has in our case its disadvantages as well as its advantages, because the variation from one species to another and from one group of species to another is often gradual, so that in effect one form merges into another.

Differences in number of parts provide criteria of a more definite kind than size and shape and such variations are found with regard to the number of corolla lobes (4–8), the number of stamens (5–25) and the number of chambers in the ovary (5–20).

If a few aberrant species are excluded, members of the Falconeri and Grande Series have an 8-lobed corolla, and those of the Fortunei Series a 7-lobed corolla. (Fig. 19.) Nearly all other Rhododendrons have a 5-lobed corolla (4-lobed or 6-lobed corollas are rarely met with and appear to be incidental). The number of stamens usually corresponds to the number of lobes; where the corolla is 8-lobed the number of stamens is 16; where it is 7-lobed 14; and where 5-lobed the number of stamens is 10, except that there is not infrequently a reduction to 5 as in the Anthopogon and Azalea Series. A departure from the normal number, where there is no definite collation between the number of corolla lobes and stamens, (as in the Maddenii Series, Maddenii Subseries, and the Fortunei Series, where the stamens are respectively 15–25 and 12–25) is a criterion of secondary importance. The number of chambers in the ovary is most commonly 5, but frequently 10; a higher number in the Maddenii Series is of some taxonomic significance. (Fig. 14.)

The inflorescence (leaving aside the series already discussed) is umbellate, less seldom umbellate-racemose or racemose. The truss is compact and many flowered, or few-flowered and loose, or the flower is solitary. There is a marked distinction between a compact, many-flowered globular truss as in *R. barbatum* Wall. and a loose few-flowered truss as in *R.*

*neriiflorum* Franch. But the compact truss is by no means a constant feature of any one series. In the Arboreum Series for example, a compact globular truss is characteristic of the Arboreum Subseries, but not of the Argyrophyllum Subseries. The inflorescence though a conspicuous character is one which is difficult to use with advantage as a means of discrimination. The terms compact and loose cannot be strictly defined; from a 20–30-flowered truss to the single flower, every intermediate number may be found. Nor is the candelabroid nature of the truss of the Ponticum Series a definite enough character upon which to place reliance.

The size of the calyx (used with other criteria as diagnostic for the Megacalyx subseries of the Maddenii Series) is in general too variable in closely related species to have much value in the determination of series.

The corolla is very variable in size and shape, rarely it is somewhat irregular or 2-lipped. The more outstanding differences in shape are expressed by the terms :—funnel-shaped, campanulate, ventricose-campanulate, rotate, tubular and salver-shaped, but intermediate forms funnel-campanulate, tubular-campanulate or rotate-campanulate are no less frequent. For the most part the shape of the corolla must be regarded as a subsidiary character, although completely diagnostic for the Anthopogon Series (in the wider sense), the only series in which the corolla is salver-shaped. In some series the corolla shape is not constant, for example the Edgeworthii Series, where the flower of *R. Edgeworthii* Hook. f. is funnel-shaped, while that of *R. seinghkuense* Ward is rotate; in both species the scales are concealed by a hairy indumentum.

Tubular flowers, which are rare in the genus, are an outstanding feature of *R. Keysii* Nutt. and of *R. spinuliferum* Franch., the former now in the Cinnabarinum, the second in the Scabrifolium Series, another instance of the shape of the flower being obviously regarded as relatively unimportant. The wide range of variation in the size and shape of the corolla as shown in the genus is illustrated in the accompanying diagram. (Fig. 16.)

A noteworthy feature correlated with the shape of the corolla, which may be observed in species of the Arboreum, Barbatum, Thomsonii and other Series, but not in all species, is the presence of prominent nectar pouches at the base of the corolla, frequently intensely coloured. This is a character of some minor importance as is the texture of the corolla. To some extent also the colour of the flower may be an indication of affinity upon which we have a recent commentary of some interest by Mr. F. C. Puddle (The Breeding of Pedigree Rhododendrons, Rhod. Year Book, 35–41, 1948).

Whether the style is long and straight as in *R. Maddenii* Hook. f., or stout and sharply bent as in *R. Boothii* Nutt., is a criterion which has proved useful in distinguishing between various lepidote series. Again the very thick, short style of the Anthopogon Series is noteworthy; as is the completely glandular style of the Fortunei Series. (Figs. 17, 18.)

The presence or absence of hairs and/or glands on the ovary is used as one of the principal characters for distinguishing between species of the Campanulatum, Lacteum and Taliense Series, and between subseries of the Taliense Series, but is one which, in the absence of some strong supporting character, does not appear to be very satisfactory. The sickle-shaped fruit said to distinguish species of the Fulvum Series is again an indefinite character.

Other differences in flower structure have not been specifically mentioned, since, though they may serve to distinguish between species, they have little significance above species level.

Passing now to vegetative characters, mention should be made of the varying size and shape of the leaf. Compare the extremes, *R. sinogrande* Balf. f. & W. W. Sm. or *R. giganteum* Forrest with leaves sometimes more than 2 feet long, and *R. lapponicum* Linn. or *R. nivale* Hook. f. whose leaves are less than $\frac{1}{4}$ inch in length. But there is every intermediate between.

The shape of the leaf is in some instances discriminating; the rounded leaf of the Thomsonii Series versus the pointed leaf of the Irroratum Series; the obovate leaf of the Haematodes Subseries versus the elliptic or rounded leaf of the Taliense Series; but leaf-shape is by no means a definite character. However, the strongly bullate leaf of the Edgeworthii Series appears to be completely diagnostic.

We have already noticed the deciduous leaves of the Azaleas but, as everyone knows, the Kurume Azaleas are more or less evergreen. None the less this is a useful criterion because all other Rhododendrons are evergreen except *R. albiflorum* Hook., *R. semibarbatum* Maxim., *R. trichocladum* Franch., *R. dauricum* Linn. and their allies, and a few species of the Triflorum Series.

As to the foliage buds, these are normally rounded, globose or conical, but long-pointed buds, club-like in shape—an unusual feature—are conspicuous in the two members of the Auriculatum Series and in some species of the Parishii Subseries. This character, shared by *R. auriculatum* Hemsl. and *R. Griersonianum* Balf. f. & Forrest, has been taken (with strigose hairs on the shoots and petioles) as a strong indication of relationship between these two species. It is stated that: "The long pointed

buds are very characteristic. Not only are the buds of the two species alike in shape and in their long scales, but in both species the flower-buds are remarkably like the foliage buds. It is true that the flower-buds are somewhat larger and thicker than the foliage buds, but they are not different in shape as is frequently the case in members of the genus. This would seem to support the correctness of associating the two species as a small but distinct series." (Species of Rhododendron p. 38.)

It may be remarked, on the contrary, that but for this character the two species are markedly dissimilar. They differ even as to the number of lobes in the corolla, the one has a 5- the other a 7-lobed corolla. In this instance we shall have to consider whether or not the advantage of a synthesis based upon a secondary character outweighs the disadvantage of keeping these not very similar species apart in two separate series. To keep them together undoubtedly adds to the practical difficulties in drawing up a key.

Finally, but by no means last in the scale of importance, are the minute characters which previously have been discussed, particularly the leaf anatomy and the trichome type.

Examples to show how the trichome is highly significant have already been given. Many other instances where the trichome seems to indicate affinity have been noted, often between species now in different series; conversely, species now together in one series have been found to have markedly different trichome types. These observed facts are now being studied in relation to other characters, but some time must elapse till the whole question, with its many problems, is thoroughly explored, and it would be imprudent to attempt to give a fuller account at the present time.

All these then are the criteria which are at our disposal for the subdivision of the genus, enabling us to recognise affinities and to delimit associated groups.

It will have been observed that the criteria vary greatly in their importance and significance; their value changes from group to group. No fixed standard can be laid down by which to estimate their individual worth, and the varying significance and uncertain limits of the criteria create real difficulties in attempting to find a natural arrangement which is based upon approved affinities.

While some criteria permit us at a glance to recognise the species of an allied group and clearly to demarcate them, others, for various reasons, are of little value from a taxonomic point of view; and some have a wide, others a narrow field of application. Seemingly trivial characters are frequently highly significant; it

is essential not to neglect structural differences down to the most minute detail.

For the reassessment of the series we have now reached a point where we are able to add to those criteria previously available others which have but recently been examined and fully appreciated.

The old and new must be appraised and together evaluated anew. Already in the sifting and arranging of the material the significance of the new criteria has become evident in the reinforcing of defective criteria, in the eradication of aberrant species, and in strengthening lines of demarcation where they are at present ill-defined. We know, moreover, that some of these minor criteria show a stability which is not to be ignored and which the major criteria lack.

But if the new criteria are to have their full value as they ought, then some adjustments must be made. The series will no longer be arranged exactly as they are at present, yet it may be said that the reorganisation will not greatly disturb the main outline of the classification. Often the new criteria will confirm that the subdivisions to which we have become accustomed are right, by providing a complementary character coinciding with those that are already used. The many individual problems connected with a revision of the series I do not, however, propose to discuss in detail, for as yet I cannot predict what will be found at the end of the road along which I have led you.

But, from a wider point of view, some further observations may be made with regard to the project we have in view.

The classification of Rhododendrons was initiated long ago and has been modified many times; unless there is good reason for a change, "leave well alone" should be the rule to go by.

Revision in the past has been concerned, for the most part, with the further subdivision of groups deemed too heterogeneous to form a satisfactory unit, and this procedure reached a culmination in "The Species of Rhododendron"; but it is clear that with further revision the tendency will be towards still further partition.

Although this may be regarded as disconcerting, it is none the less inevitable. However, we should bear in mind that subdivision may go too far and where possible a synthesis should be sought for.

These are general principles by which we should be guided. In particular, we have seen that a number of major criteria may be used to divide the genus into two or three large sections—the presence or absence of scales—the ptyxis of the leaf—the nature of the epidermis and the structure of the seed; and that other

criteria may be used to separate off a number of smaller but outstanding groups—*R. camtschaticum* Pallas and its allies—the Azaleas—*R. vaccinioides* Hook. f. with its allies—and again species in various series with axillary flowers. We are agreed that all species included in the above company are readily separated from other Rhododendrons, and they are distinguished by important criteria.

On this account some botanists hold the view that the genus as it stands is a heterogeneous assemblage which ought to be divided so as to constitute a number of quite separate genera. The actual number proposed, three, four, five or more, varies according to the attitude of the individual. But the standpoint taken in "The Species of Rhododendron" is the direct converse, for not only are all the above-mentioned groups retained within the genus, but none whatsoever of the major characters has been given any extra weight. The approved arrangement divides the genus from the start into forty-three units of equivalent rank.

Which of these opposing views is the more correct? It is a matter of opinion, "each mind has its own method."

In my view no useful purpose is served by increasing the number of genera and I think I shall have the approval of the majority in proposing that the genus, as it stands, should be kept as a whole.

But, at the same time, it is obvious that an initial division of the genus into a very large number of groups must add to the perplexities of those who turn their attention to it for the first time and make it unnecessarily difficult for others to comprehend. A smaller number of divisions would be easier to appreciate and to understand.

I venture to suggest, therefore, that we should follow an intermediate course, for which we have the precedent of some of the earlier arrangements. Is the approach not made easier by agreeing to recognise a number of subgenera or major sections as an initial step? Within these the lower-ranking series can be grouped.

Whatever arrangement it may be decided ultimately to adopt, the recognition and segregation of the aforesaid groups will present no serious difficulty.

When we come to further subdivision, floral characters must play an important part, but we are here approaching a region of indefinite characters which require support. None the less, a number of units may be distinguished without dubiety. At length, however, in order to sort out the mass of material which remains, we have to depend upon less satisfactory criteria or look for those that are less conspicuous. Those we have chosen to

use as major criteria in the past have not always been the most reliable at our command. It is at this stage, where true relationships are at present obscure, that the nature of the trichome will, I am inclined to think, show a degree of continuity which itself will be diagnostic and, thus providing fresh data, will enable us to settle, not all the outstanding questions, but many points which are still unexplained.

As I indicated in the introduction, many aspects of our subject must necessarily be passed over or have but a cursory glance bestowed upon them, and in this brief survey I have chosen to direct your attention chiefly to the principal characteristics shared by related species which constitute the natural associations of Rhododendrons. And I have emphasised this aspect of the subject because further progress in our understanding of the genus depends upon a full knowledge of the nature and significance of the characters upon which the whole classification of the genus is based. These characters are the fabric of the structure and the foundation upon which it rests.

After describing the many characters I have attempted to estimate their relative and varying value, although there is no fixed standard by which to measure them and their diversity is great.

Their prominence or obscurity is no guide to their real significance, and I have stressed the importance of even the most minute. Indeed, I would make my major theme the importance of the insignificant, so outstanding is the part which the minute structures, in their great diversity, play in the whole elucidation of the genus.

The work of classification has been likened by Alphonse de Candolle to that of a mason, who dresses his stones and builds them one by one without knowing what the finished work may be like. But with Rhododendrons the finished edifice is before us, its outlines are beyond dispute, the framework is complete. Our task for the future is rather that of the architect who has been called in to renovate, to make good parts where the construction has been faulty and to suggest improvements where it is agreed that they would be of advantage. We have now examined the general structure; we are well informed as to what is required to be done, and we have gathered together materials for reconstruction, the necessary well-weathered stones, the new-made bricks, the prefabricated parts and the plastic materials, which are the criteria that we have examined and discussed in this survey.

## DISCUSSION

FIRST QUESTION. In hybrids, do you find the hairs follow either the father plant or the seed parent—or have you not got as far as that in your investigations?

*Dr. Cowan.* I am afraid I have not investigated the hair structures of hybrids, I have had enough to do to cover the species, the bulk of them. There is a very interesting paper published in the 1946 *Rhododendron Year Book* on Rhododendron 'Grierdal.' This hybrid was investigated by MISS WATERSTON and as you know, R. 'Grierdal' is the one instance in which a scaly Rhododendron and a hairy Rhododendron were intercrossed. When the structure of the scales and hairs of the hybrid and both its parents had been examined, it was found that those of the hybrid 'Grierdal' are somewhat intermediate between the two. It is a subject that might be worth while investigating further, but I shall have to ask some of you who are making hybrids to have another try to experiment and see if you cannot get some more lepidote and elepidote crosses for me to examine.

SECOND QUESTION. How important is the characteristic of colour and flower?

*Dr. Cowan.* That is also a difficult question to answer. In certain species it is quite important, in some groups it is fairly important, and in others it is not. One can think, for example, of *Rhododendron aperantum* or *R. Stewartianum* where there is a varied range of colour from white to pink, and yellow in both species. On the other hand, most species in the Neriiflorum Series—not all—are red. Diagnostically colour is of value, as is the spotting or absence of spots on some occasions, but it is a secondary characteristic because structure must come first.

THIRD QUESTION. Do the root structures vary at all?

*Dr. Cowan.* I have not examined the actual structure of the roots in detail and cannot tell you, I am afraid, whether microscopically they differ at all. I do not think any comparative work has been done on this subject, at all events it must be very little.

*Chairman.* There is one other question I would like to ask DR. COWAN. I noticed in one of his slides, one which showed the convolute and revolute leaves, that the bundle in the one was single and in the other, it had accessory bundles on either

side. That leaf would appear to have been cut at a point near the junction of secondary veins with the midrib.

*Dr. Cowan.* Yes, towards the base of a pair of lateral nerves.

*Chairman.* Well, the leaf anatomy would seem to correspond to what the French call taxonomically "un nouveau caractéristique" Has it any value taxonomically?

*Dr. Cowan.* Yes. We have not gone fully into the question as yet but there are one or two anatomical features of the leaf which may be of interest. Certain factors may be of some taxonomic value.

*Chairman.* Well, I am sure you would all wish to express your deep appreciation of the interesting communication which DR. COWAN has given us and I think I would like to emphasize the enormous amount of work involved in the exploration of the significance of even one character like that of the hairs, in a genus where so many species are concerned. The mere labour of investigation of a single character like this is enormous, and as DR. COWAN has already indicated, there are others which are yet to be exploited. So may we, at the same time as expressing our thanks to DR. COWAN, express the hope that he will have a very long life in which to explore all these other characters, and we wish him every success.

# PROPAGATION OF RHODODENDRONS

F. E. W. HANGER

(*Paper read on April* 27, 1949, SIR EDWARD SALISBURY, F.R.S., *in the Chair*)

THE first word in the title of this paper, "propagation," immediately excites interest. I firmly believe that there is no operation in the art of gardening more fascinating, nor one which gives more pleasure to the grower. Next to seeing the tree or shrub in all its flowering or berrying glory what can give one more pleasure than to watch the seed germinate or the cuttings produce roots and grow?

When we possess some really good hybrid or precious plant we naturally wish to propagate it. This enables us to share our good things with friends, for all true horticulturists are generous and derive much pleasure from giving fellow gardeners a portion of a novelty or rarity. Again, happy is the grower who, when he has lost a really good plant during some cold winter or by some other cause, can go to the nursery or cold frames and find a duplicate which he has propagated in readiness for such an occasion.

The skilled gardener is not the person who just plants the tree or shrub in good soil when it is say three to four feet high, but the person who has produced that plant either from a seed, a cutting, a layer or by grafting. Surely this is the essence of good gardening?

My paper today, which I feel honoured to be giving to this Conference, is entirely devoted to the "Propagation of Rhododendrons." There is perhaps no other genus of plants which exhibits such an enormous variety of size, form, habit and growth, and it is therefore not surprising that, to get the best results, we have to adopt various means of perpetuation.

## HARVESTING THE SEED

In their wild homes Nature's chief method of regeneration of Rhododendrons is by seed. Another means of reproduction occasionally encountered in nature is by layering, but this is far less common. The great majority of the Rhododendrons in our gardens today is the result in the first instance of plants raised from seed introduced by such great plant explorers of the past as SIR JOSEPH HOOKER, ROBERT FORTUNE, E. H. WILSON and GEORGE FORREST. Outstanding amongst present day collectors are CAPT. F. KINGDON-WARD, DR. J. ROCK of America, and Messrs. F. LUDLOW and G. SHERRIFF.

The advent into this country of so many new species of

Rhododendrons during this century has enabled Rhododendron enthusiasts to create thousands of new hybrids, and amongst them are some of the very best evergreen flowering shrubs in cultivation. Some of these hybrids will flower in five or six years, but others, with *R. discolor* blood, may take fifteen years to bloom. "To know how to wait is the secret of success."

From the day the flowers are prepared for hybridization by emasculation and removal of the petals, until the seed is gathered, great care will be necessary to see that nothing harmful happens to the developing capsules. I find that a wise precaution is to push a tall bamboo stake into the ground near that portion of the bush where the cross has been made. This answers several purposes. Firstly it warns the persons who are responsible for the removal of the dead flower heads to go carefully when "picking off" near the branch with the label attached denoting the cross, and secondly it enables the collector to find easily the position of the capsules. Should the garden be large and many hybrids made yearly, a list should be made in a book at the time of creation.

From the end of October onwards will be the time to watch the seed pods very carefully, and at the first sign of the capsules opening they must be gathered for safe keeping. Leave the seeds on the plants as long as possible to enable them to be fully matured, when the pods will have attained that brown, "dry" appearance denoting ripeness.

Any hybrids between the Lapponicum or Triflorum series will be ready first, but late December may arrive before *R. discolor*, *R. auriculatum* or their hybrids are fit for gathering. Should any very special hybrid made during the season remain late on the parent plant it will need constant watching, especially after frosts, or the splitting of the capsules may scatter the whole crop of seed in a day or so, and another year at least must elapse before the cross can again be made.

If at all possible collect the seed during dry weather; place it in carefully labelled packets, and at the first opportunity enter the crosses in the stud book, giving each new hybrid a different number. Store the packets of seed in a tin box for safety from pests, and place it in a dry cupboard until early January.

The seed should then be cleaned ready for sowing, when it will be found that most of the capsules will have opened and the seed become easy to extract. Pods still intact may be easily forced with the aid of a penknife. It is most important to clean the seed well, removing all chaff and pieces of capsules formed by the breaking down of the seed pods during the extraction of the seeds. Should any waste be sown with the seed on the surface

of the seed-pans it usually attracts a fungus which speedily causes trouble amongst the tiny seedlings.

Most elementary, yet none the less important, is the necessity of great caution during the cleaning period to prevent seeds of the different hybrids being mixed while the cleaning operation is in progress. The seed being so minute it is quite possible to mix it without knowing. Care must be taken that no seed remains on the cleaning paper or on the operator's hands after each packet of hybrids is cleaned. Just a few small seeds adhering to the warm hand and carried into the next packet mean much confusion when the seed germinates and the plants flower. The writer has several times wondered when shown some new hybrid Rhododendron of a supposed certain parentage whether that particular plant was not a stray from another packet of seed at cleaning or at sowing time.

## SEED SOWING

The middle of January to the middle of February is the best time to sow the seed of Rhododendrons and deciduous Azaleas, providing a propagating frame inside a greenhouse with bottom heat and a temperature of 55°–60° F. is available. My seed is sown as soon as possible, usually by the middle of January, as this early start enables the plants to have a good long season and to become strong enough to withstand the coming winter.

Various different composts have been tested by the writer during his experience of raising tens of thousands of Rhododendrons from seed, and he is convinced that nothing beats a good granulated peat properly prepared with a little silver sand added. This mixture has a low *p*H value of somewhere near 4·0, yet the seedling plants will live and exist in it for years, and once they have become hardened off no disease or fungus seems to affect them.

To prove the lasting qualities of granulated peat I need only describe one little incident. At Exbury I was in the habit of placing all the Rhododendron seed pans containing surplus seeds behind a tall north wall, there to remain indefinitely. The late MR. LIONEL DE ROTHSCHILD flowered a particularly good *R. Griersonianum* hybrid and rather regretted having such a small number of them. On returning to the garden a search was made among the old seed pans, and although five years had elapsed since being placed there a pan was found containing the remainder of the seedlings of the desired hybrid. Naturally they had become woody and about six inches high, yet it was possible to single them off and grow them on.

Except where very large quantities are required Rhododendron and Azalea seed is best sown in pans or shallow boxes according to the amount of seed available. The receptacles should be perfectly clean and half filled with washed crocks. Pass the peat moss through a quarter-inch sieve, then mix a little silver sand with it, and it is then ready to place in the pans or boxes. Being of a spongy nature, a little patience is necessary to press the material evenly in the receptacles. Do not try to fill the containers in one operation, but rather in layers, until the pan is filled to within a half inch of the top. Finish the surface off with a layer of the same compost passed through a much finer sieve and press firmly. This gives a very even surface on which to sow the seed. To prepare these seed vessels perfectly one must have the compost in the correct state as regards moisture. Usually it is necessary to add water, which of course must be soft rain water. Gradually add the water and at the same time well mix the peat by constant rubbing between the hands. When the pans or boxes are prepared they should be really well soaked again with rain water and allowed to stand all night ready to be sown on the following morning. Sow the seed evenly and reasonably thinly on the surface, label each receptacle when completed, but do not cover the seed with the exception of the largest Rhododendron and Azalea seed. These are rather wingy and apt to move easily and should be just covered for rigidness. All is now ready for the receptacle to be plunged in the propagating frame which has previously been well cleaned out and new granulated peat placed ready for the plunging.

With a bottom heat of 55° to 60° F. one must guard against fluctuations between dryness and saturation. A uniform moisture is essential, and on no account must the surface of the seed beds become dry, or the sprouting seed may become scorched through lack of water almost before one has noticed that germination has commenced. This is even more important with the "alpine" species of Rhododendron. Here the seed is so small and the ultimate growths so threadlike in appearance that a magnifying glass is necessary to view the primary germination. These small Rhododendrons need removing from the very close propagating frame earlier than their larger growing cousins and are much better placed on a bench in the house, to be covered with pieces of glass, as soon as it is possible to see movement.

I have many times been approached as to the cause of failure to germinate these alpine Rhododendrons. In some cases the seed has been covered too deeply, but in the majority of instances the grower has not realized the germination of his seed,

and lost it through various means, such as one overhead "drowning" immediately the threadlike growths are trying to establish themselves. Another fatal mistake with this type of seed is lack of air as soon as the cotyledons are developed. However, with the majority of Rhododendrons, and especially deciduous Azaleas, it is quite easy for any ordinarily observant person to see the commencement of the germination.

As soon as the first cotyledons appear an anchoring of the seed will be necessary. This is easily accomplished with a fine layer of silver sand applied when the seedlings are dry, taking care not to overdo the operation and bury the cotyledons. From now on air should be given to the propagating frame, to be gradually increased as the seedlings grow. Eventually they become strong enough to be placed on the bench in the house outside the frame. Approximately a fortnight will pass before the commencement of germination and another fortnight before removal from the propagating case. Care must be taken to keep the sun's direct rays from shining on the seedlings. All watering if at all possible should be capillary, i.e. by placing the pans in containers of rain water and allowing the moisture to creep through the bottom until the pan is thoroughly soaked. This is to be preferred to overhead watering with a fine rose.

There are other means of raising Rhododendron seedlings but the foregoing method is advised for maximum development in the first season. Seeds sown in the same compost and placed in a warm house covered with a sheet of glass or even in an unheated house, although slower, will give very good results. Excellent results may also be obtained by sowing Rhododendrons, especially Azaleas, into cold frames and keeping them shaded and close until germination takes place. In this case the last week in March will be early enough to sow the seed and if precautions are taken to sow thinly the young plants can remain undisturbed until the autumn or following spring. With such treatment a compost of equal parts of granulated peat and lime free loam is advised, with a surface layer of fine sieved granulated peat and silver sand.

The writer has sown spare seed outside in the woodland nursery with excellent germination, which proves how simple it is to germinate Rhododendron seed. However, where the conveniences are available, the warm treatment is very much quicker and by far the better way.

## SEEDLINGS AND THEIR CULTIVATION

The pans of young Rhododendron seedlings must be kept growing freely in a warm greenhouse. To encourage them it will

be necessary to syringe between the pans and over the seedlings in the morning and afternoon on all mild sunny days; and at the same time keep the paths, etc. of the house damped to create those ideal growing conditions so essential for the production of free clean growth.

Arrange the seedlings as near the glass as possible, and protect them from mid-day sun. It is not advisable to have permanent shading at the commencement, but just a temporary light covering, which should not be placed immediately on the pans, or boxes, of seedlings. As April approaches and the sun becomes more powerful a permanent shading may be painted on the glass, taking care not to apply the covering too thickly.

Always keep a sharp look-out for attacks of greenfly amongst the seedlings. These will, if allowed to remain long unnoticed, speedily cause a severe check in growth, and also disfigure the tiny young leaves. A fumigation with nicotine compound as soon as the pest is discovered, making sure that the seedlings are dry overhead, will easily dispose of this trouble. As "prevention is better than cure" a fumigation of the house containing the seedlings once a month during this seedling stage assures the grower of seedling plants free from pests. By the month of April the seedlings will have produced their first true leaf and then preparations must be made to prick out the plants into boxes without delay, to prevent any check in growth.

If possible it is advisable to make or buy good strong boxes for Rhododendron and Azalea seedlings; a very convenient size for handling is 18 in. long, 12 in. wide and the inside measurement of the depth should be three inches. Should boxes less in depth than the three inches be used there is the risk of them drying out too frequently when the seedlings are established in the hot summer months. If this is allowed to happen the results would be fatal. Where it is found compulsory to use shallow boxes the wisest plan to assure uninterrupted growth is to transplant your seedlings from the boxes into the cold frames, before they become starved. Prepare the boxes in the following manner. Commence by using clean boxes which should have all cracks between the strips of boarding covered with a layer of thin clean crocks, over which place a layer of medium size granulated peat.

The remainder of the box should be filled with a compost of two parts of lime-free loam, one part granulated peat, one part clean oak leaf-mould and one part coarse sand. Should there be the least doubt regarding the pureness of the leaf-mould replace it with an extra part of good granulated peat. This compost must be made quite firm in the boxes, paying special attention

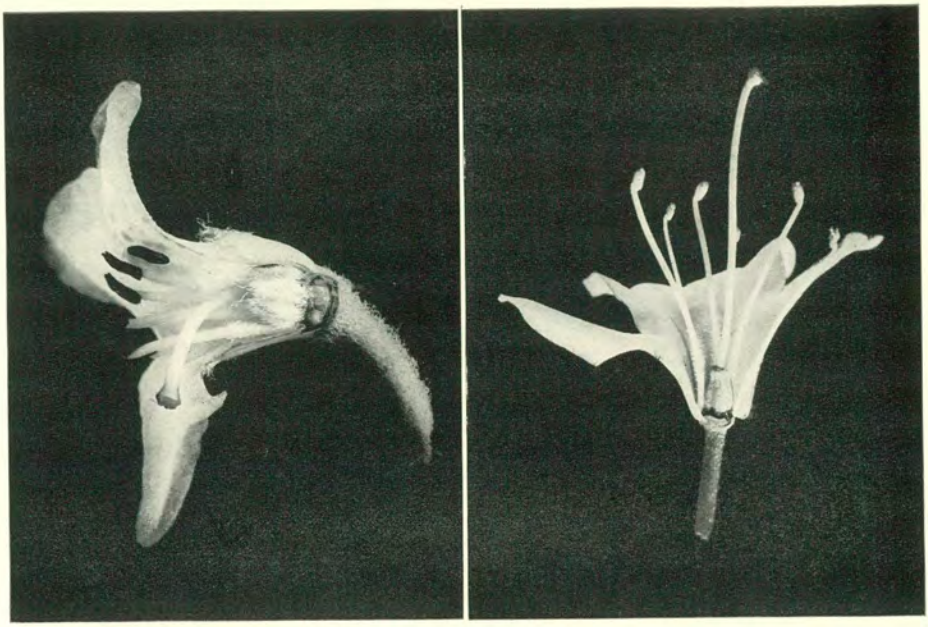


FIG. 17 (left)—A stout shapely bent style (*R. pendulum* Hk. f.)
FIG. 18 (right)—A long straight style (*R. racemosum* Franch.) (See p. 52)

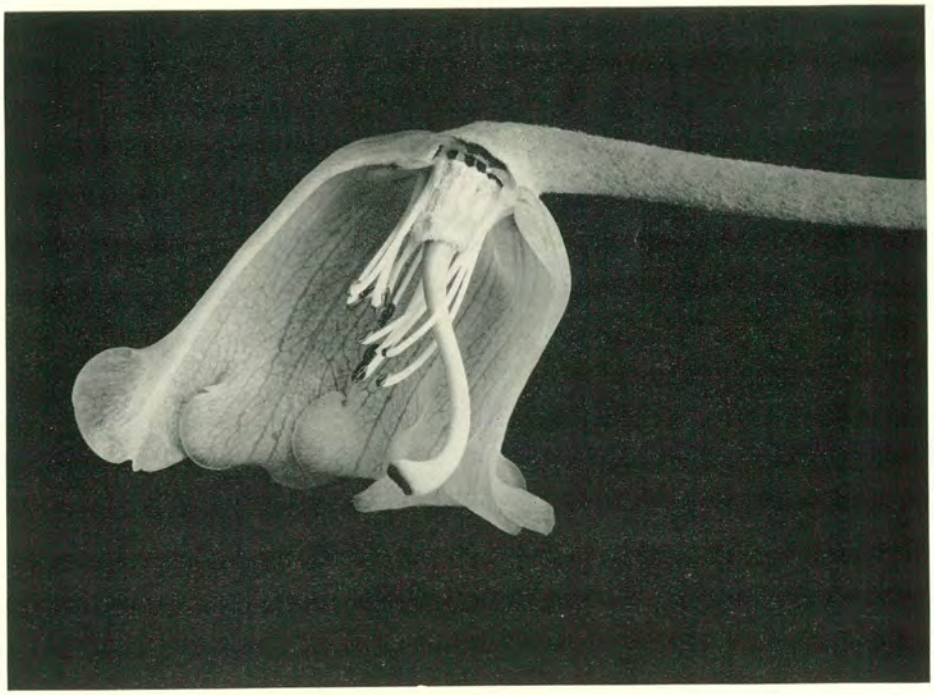
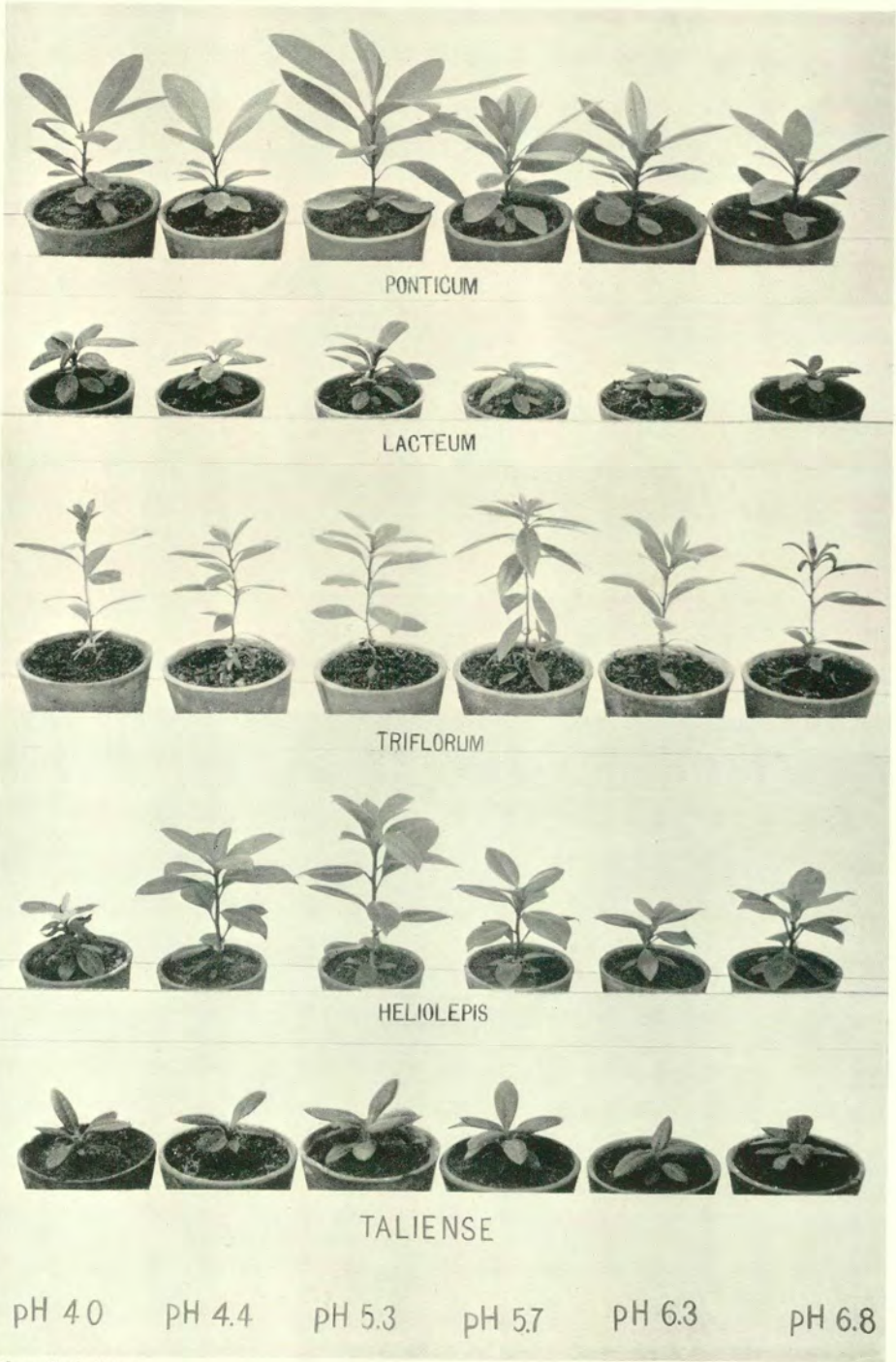




FIG. 19—The Falconeri and Grande Series usually have an 8-lobed corolla and 16 stamens. A section of the flower of *R. sinogrande* Balf. f. and W. W. Sm. (See p. 50)




*Photo, R. P. Scase*

FIG. 20—The effect of pH on the growth of Rhododendron seedlings (See pp. 68, 69)

to the corners. The boxes are now ready to receive the seedlings. Commence by pricking off the most forward plants. These no doubt will be the deciduous Azaleas, followed by *R. discolor* and similar species or their hybrids, and finally the tiny little growers. These dwarf creeping varieties seem to prefer to be grown in square earthen pans, and need to be grown much closer together. In a box of the size previously mentioned 32 to 40 seedlings can be grown according to their vigour, and care must be exercised to handle all the seedlings by their cotyledons, and not their stems.

When dealing with hybrids it is a wise policy to work two boxes at once, pricking the large seedlings into the one box, and the small ones of the same variety into the second box. On no account should the strongest plants be selected and the smaller ones destroyed, for being hybrids no two may flower alike, and it may be a case of "Quality—not Quantity." Too often with the raising of hybrid Rhododendrons we have found the strong coarse growers are the least attractive of the batch.

As soon as the seedlings are pricked out, give them a light watering-in with rain water, and keep the house on the closed side for a couple of weeks. Give the plants at this stage plenty of overhead fine spraying rather than too much watering. Under such conditions the young Rhododendrons will soon get root hold and grow away. While the plants are small they are like babies needing coddling, but as they grow larger they must have more air and become gradually hardened off until they are fit to be transferred to their cold frames.

At Exbury last year seed of deciduous Azaleas sown early in January produced seedlings six and more inches high by the end of June, which were then transplanted into a woodland nursery to become well established plants by the winter. Grown in this ideal manner the owner will have the pleasure of seeing the majority of these hybrid Azaleas flower after two years' growth.

Once the plants are hardened off they may be wintered in their boxes, to be transplanted into the cold frames or nursery beds the following spring. Should the seedlings grow exceptionally well, and empty frames are available, the plants may be planted from the boxes into the frames during July and August of the same year as sowing. With this treatment the plants make a second late-growth, and care must be taken to guard against early autumn frosts, by closing the lights over them each night.

Before planting, the frames should be prepared with ample drainage, covered with dead bracken, to keep the soil from washing downwards. Four to six inches of soil will be quite sufficient, using the same compost as that used for the boxes,

and making sure to leave considerable headroom between the soil and glass to prevent the young plants from touching the lights the first winter.

Plant the seedlings in rows, using discretion as to the distance apart, which should vary according to the type of Rhododendron being planted. It should be borne in mind that the plants will occupy their positions for over a year, and therefore the very strong growers will need to be planted 6 in. × 6 in. each way. This distance will allow for ample balls of soil to be taken with the young Rhododendrons at shifting time. Immediately after planting into the frame shading will be necessary and for this purpose wooden laths are first rate.

During the summer following planting the plants may become too tall and touch the glass lights; in which case the glass should be completely removed and stored for safety. Mulch the uncovered seedlings with granulated peat or really good leaf-mould, and keep them well watered. Under such conditions no harm will come to the young Rhododendrons. During the summer months any Rhododendrons growing under glass frames should have the lights removed during the evening, to remain off all night and be replaced in the early morning. The night rains and dew will help considerably to keep the plants growing in a healthy manner, and save much watering and syringing.

## THE EFFECT OF *p*H ON THE GROWTH OF RHODODENDRON SEEDLINGS

Numerous composts of soil have been put forward as being the best for raising young Rhododendron plants from the seedling stage to the time of planting-out. Several workers have reported experiments designed to demonstrate the best *p*H for the growth of Rhododendrons, yet these are difficult to compare because of the widely differing conditions of their experiments.

Chemists when referring to the measurement of the reactions of soils speak in terms of *p*H—this being a measure of the hydrogen-ion concentration. A *p*H of 7·0 is the neutral point where acidity and alkalinity are in balance; above this reaction you find the alkalinity increasing as the figures rise, while below a *p*H of 7·0 the reaction is acid, becoming more acid as the figures decrease. It is this acid range, from *p*H 3·0 to *p*H 7·0, in which Rhododendron enthusiasts are interested.

DR. M. A. H. TINCKER (see *Journal of the Royal Horticultural Society*, Volume 61, pp. 200–204, 1936) found that his best results were obtained by growing Rhododendrons in the high fertility loam plots at Wisley, where the *p*H of the soil was 6·3. TINCKER, however, only experimented with *Rhododendron*

*ponticum* and *R. obtusum* var. *amoenum*, and was concerned with their capacities to withstand the full sun without watering or mulching. In such an experiment he naturally found the plants withstood the test in good loam much better than in a sandy or very acid soil.

American growers seem to vary considerably in their claims to have found the optimum *p*H for Rhododendrons. CARL S. ENGLISH JUNR. and EDITH HARDIN ENGLISH, writing in the *Handbook of Rhododendrons* published by "The Arboretum Foundation," Seattle, Washington (1946) state, on page 37, that "Soils for Ericaceous plants such as Rhododendrons must be of acid reaction—*p*H 6·0 being about the common average reading of conditions under which these plants grow most successfully."

MR. J. WELLS (a large commercial American grower) writing in the *Nurseryman and Seedsman*, August 21, 1947, p. 28, claims that 4·0 is the best *p*H reading for the maximum results with Rhododendron seedlings. He cuts top loam soil and proceeds to mix peat and sand with it; he then finds he has a mixture of *p*H 6·0 to which he gives generous dressings of flowers of sulphur. Three months later his soil has dropped from 6·0 to 4·2, near enough to his required 4·0. MR. WELLS was dealing with the raising of *R. ponticum* seedlings for grafting stocks only.

The writer of this paper presumes that our American friends in the past have dealt mostly with the older hybrids of *R. catawbiense* and *R. ponticum*. These differ greatly from the more recent English hybrid Rhododendrons obtained by crossing the various new species imported into this country during the present century from Tibet, China, Burma and other oriental countries. To talk or write generally of the optimum *p*H for all species of Rhododendrons may be very misleading. First of all we must realise the great differences between the various series which make up this genus. Species like *R. sino-grande* have very large leaves; when well grown they are up to 30 inches in length and half as wide. Others have leaves of various smaller sizes until we come to the alpine forms with small almost Thyme-like foliage.

The difference of habit and growth is also fantastic. *R. giganteum* attains 80 ft. in height in its natural home while *R. keleticum* and *R. patulum* are no more than an inch or so high. Some are tender and others quite hardy; some need good shelter, others will grow in most exposed conditions. Other members of the genus are epiphytic and in their wild state are guests of other plants, finding sustenance in the lichen, etc., which accumulates on the branches and trunks of large trees and shrubs.

With such a wide range of differences in their make-up it requires a very bold person to lay down definitely the true optimum *p*H to suit the hundreds of Rhododendron species with their thousands of hybrids now grown in this country.

During the past year, with the help of MR. R. E. TINCKNELL of the Imperial College of Science, it was decided to carry out an experiment at Wisley designed to obtain the most suitable *p*H for the cultivation of various types of Rhododendron seedlings. Although nothing conclusive has yet arisen from these preliminary experiments, it has certainly given much food for thought and opened up a field of research very little explored in this country up to this present date. The Wisley experiment deserves a long detailed account; this, however, is not the intention of the writer, but rather to write briefly, in a practical manner, giving his views as a grower, of the work carried out and to summarize preliminary results.

At the commencement it was decided to test Rhododendron species belonging to seven different series in seven different mixtures of soils with *p*H values varying from 3·4 up to 6·8. Great difficulty was experienced in obtaining soil with a *p*H as low as 3·4, but with the addition of aluminium sulphate this low acidity was attained. The mixture was kept for three weeks before being used, but unfortunately the quantity of aluminium sulphate essential to produce this low *p*H seemed to exceed the limit of plant tolerance, resulting in the death of the majority of the seedlings. With regret therefore, it was decided to delete this *p*H of 3·4 from the experiment, leaving six different composts with compost of *p*H values of 4·0, 4·4, 5·3, 5·7, 6·3 and 6·8 respectively.

These various *p*H values were produced by mixing different proportions of granulated peat, leaf, lime-free loam and sand, the amount of loam used in a mixture more or less determining the value of the *p*H.

The compost with a *p*H of 5·3 consisted of the John Innes potting compost minus the ground limestone or chalk, i.e. :

7 parts loam by bulk
3 ,, peat ,, ,,
2 ,, coarse sand by bulk

To each bushel of compost was added

1½ oz. of Hoof and Horn ⅛ fine grist
1½ ,, ,, superphosphate
¾ ,, ,, sulphate of potash

The highest *p*H mixture of 6·8 consisted of the same John Innes potting compost mixed with ¾ oz. of carbonate of lime per bushel.

A Cambridge *p*H meter was used to obtain correct readings, as this method of recording *p*H values has proved the most accurate.

Rhododendron seedlings direct from their seed pans were pricked into boxes or pans containing the different composts as soon as the plants had developed their cotyledons. At the subsequent potting off, 12 plants of each species were established in pots with the corresponding soils.

By using seedlings and growing them in ideal conditions the effect of the different soil conditions would be quickly shown by the plants. It is well known that long established plants take some time to react to changed environment, and using such plants it would probably be necessary to continue observations for some years before conclusions could be reached.

The amount of growth made by the plants in the period of the experiment is shown in the photographs which represent the best specimen from each group after twelve weeks of growth. Although the best plant of each group was chosen for photographing, there was no really great difference of growth between the plants from any one compost. (Fig. 20.)

The remaining plants (eleven of each group) were cut off at soil level, air dried, and weighed in order to get a more precise measurement of growth.

A visual assessment of growth from the photographs is also important, however, as the production of a large weight of plant material is not the only desirable feature. For example a tall spindly plant may well weigh more than a compact sturdy one, although obviously the latter is to be preferred. Generally speaking there was a good agreement between the evidence of the photographs and that of the air-dried weights.

*Discussion of Results.* As the writer has previously mentioned, he does not intend in this paper to print tables of weights and measurements, as the experiment was of a preliminary nature, and of short duration, needing fuller investigation of the findings as soon as opportunity allows. However, it has more or less established certain important points. Outstanding amongst these is the fact that *Rhododendron ponticum* grows equally well over a wide range of different soils. This proves its worth as the best stock for use in the grafting of the hardier hybrid Rhododendron for general planting in many different soils and positions. It is also worthy of note that the *R. ponticum* plant growing in the compost *p*H 6·8, with lime added, is flourishing reasonably well.

Also of great interest is the fact that the *R. lacteum* plants appear much more at home in the more acid soils of 4·0, 4·4 and 5·3 and here it is regretted that the experiment did not

contain the very acid soil of 3·4 which had to be deleted. This lovely Rhododendron is fast dying out in cultivation; many of the established large plants in this country are gradually fading away, and one wonders if this particular series needs a very high degree of acidity for perfect cultivation.

The Triflorum series, judging from their appearance in the photographs, needs a moderately acid soil and definitely will not tolerate any trace of lime as shown by the miserable looking plant which has endeavoured to grow in *p*H 6·8 containing carbonate of lime.

This is not the case in the Heliolepis series, for here the plant in *p*H 6·8 does not object to that little degree of alkalinity, nevertheless does best in a reasonably acid soil of from 4·4 to 5·7. These particular plants are *Rhododendron rubiginosum*, which rather emphasize the late MR. LIONEL DE ROTHSCHILD'S theory that *R. rubiginosum* would grow in soil which was slightly alkaline; so much so, that we wondered if this particular plant held possibilities as a stock for such soils.

The rather uninteresting Taliense series seems to grow moderately well in most lime-free soils with a definite preference for a *p*H of 5·3 to 5·7, but in the case of the Anthopogon series the best sets of plants were in the less acid soils.

*Summary of Experiment.* Bearing in mind the rather severe limitations of the experiment, I believe that the optimum range of *p*H for Rhododendron seedlings is somewhere from 4·2 to 5·5, with the higher *p*H for the small-leaved varieties, and the more acid soil for the large-leaved species.

It should also be noted that the addition of fertilizers in the John Innes compost in the *p*H of 5·3 certainly seemed to benefit the plants. In fact, this point appears to be so important that in any future work to find optimum growth conditions, the feeding of the Rhododendrons should be studied as well as the *p*H values.

The writer has always been successful in raising Rhododendron seedlings in the following compost :—

2 parts lime-free loam
1 part granulated peat
1 ,, good decayed oak leaf mould
1 ,, sand

Should there be any doubt as to the purity of your leaf-mould, or it is found impossible to obtain it,

2 parts lime-free loam
2 ,, granulated peat
1 part sand

will be quite a successful mixture. These soils usually have a *p*H somewhere about 4·2 to 5·5 according to the loam make up, and in such soils the majority of Ericaceous plants grow really well. The amount of sand may be altered to vary the texture of the loam, bearing in mind that sand added to soils does not in any way alter their *p*H values.

## RHODODENDRONS FROM LAYERS FOR THE AMATEUR AND COMMERCIAL GROWER

This means of propagation is probably the most popular amongst amateur and commercial growers alike. Being very easy to perform it gives the amateur without any glass department the best and most successful means of increase. It has other advantages, as it can be done at any time of the year, frosty weather excepted. Naturally some seasons are to be preferred to others, but from the amateur's point of view he can stop and layer suitably placed branches just when he feels most inclined.

I propose to deal with the amateur and the commercial grower separately, as the former will be more than satisfied to get a few duplicates for himself and his friends, whereas the latter grows for sale and must think in terms of thousands.

The amateur, when selecting the branch he intends to layer, will not, I hope, make the mistake generally made, i.e., try to obtain a matured plant by layering too long a branch. If he does, the wood will be much too old and hard and will take far too long to respond to the wishes of the propagator; the resultant layer will be too leggy and unsightly ever to make a really good well-shaped plant. Instead he should peg his long branch down to the ground right up to the very young wood and instead of one large layer he will be able to obtain perhaps up to a dozen; for every tip, if properly fastened, will root much quicker than the larger wood and eventually make an ideal plant. Having selected the branch to layer, remove the soil to form a little narrow trench and before replacing your soil peg your branch sufficiently far from the tip to enable it to be turned and secured in an upright position. Remove all leaves attached to the portions about to be buried. The abrupt bending of the elbow below the soil is of the utmost importance, as upon it success or failure depends. This acute turn to form the elbow is the means of checking the flow of sap and thus creating for the branch the necessity of forming roots to obtain food for its existence. I seldom twist or in any way bruise or cut our layers at the elbow, but rather peg it securely between the elbow and the parent plant. A small bamboo is pushed into the ground

immediately past the elbow, leaving a portion out of the ground to secure the layer by tying it in a perfectly upright position.

To anchor layers and also to form the elbow, large sand stones may also be used. Should the soil be of poor quality good soil must be placed in the trench and around the layers. Guard against too sandy a soil, as this will be difficult to keep moist and uniform moisture is necessary for quick rooting. For this reason it is not advisable in districts with moderate rainfalls to mound up the soil over the branch to be layered, but rather to dig a small trench. Rhododendrons vary a great deal in the time taken for their layers to root. *R. Hookerii*, *R. campylocarpum*, *R. barbatum* and *R. Thomsonii*, most of which have a smooth type of bark, are slow to respond, and may take up to three years, while others, with a rougher kind of bark, will be fit to remove from the parent plants after a year to eighteen months. The majority, however, will need two years before producing sufficient roots.

The commercial grower needing numbers of plants must have a well organised stool-bed of Rhododendrons. The site chosen for this purpose should be in a sheltered position with full light, and my ideal would be to have irrigation overhead to reach all parts of the stool-bed. By this means I feel confident that in a large commercial undertaking the irrigation would be more than paid for by the quicker returns from rootings in the first crop. With continued moisture through the dry summer months when the ground is warm, the layers would in many cases be ready to be cut from the parent plants and lined out into nursery rows, quite a year earlier than without the watering. The soil in this stool-bed must not be on the heavy side, but sandy enough, without being too sandy, to encourage quick root action. Should it be poverty stricken, steps must be taken to improve its condition by adding spent hops or really short extra-rotten manure.

With but few exceptions the majority of the Rhododendrons layered in the large commercial nurseries in the country are of the old "Ironclad" type with plenty of *catawbiense*, *caucasicum* and *ponticum* blood in their make up. It is a well-known fact that such plants benefit from feeding. This may not be necessary in a garden or woodland of virgin soil, but in a nursery where crops of plants are continually being lifted something has to go back into the soil. I believe it was GOLDSMITH who wrote "Take a farthing from a thousand pounds, it will be a thousand pounds no longer." To form a large stool-bed a great number of parent plants will have to be sacrificed. These would have to be lifted with good balls of soil attached and arranged in double rows across the bed, and planted well on their sides in opposite directions, to enable every available branch to be easily layered into

the ground. With very large parent plants of uneven size it would be difficult to arrange the stool-bed so as to be able to walk between the double rows of plants, but with moderately young even plants, about 3 to 4 ft. high, quite a good arrangement can be made. With this type of layering it is seldom necessary to use pegs, yet occasionally good long ones will be needed to hold into position some stubborn branch. Before commencing to layer a plant the leaves must be removed from that portion to be placed underground. Experienced labour will be wanted to bend the young stems abruptly upwards and to make the whole thing rigid in the soil. To fix the layers firmly into the soil without pegs is not easy for beginners, and if there is any doubt at all use pegs. After the first year with plenty of moisture some may be rooted, and it may be wise to top-dress the ground around the remaining layers with peat or decayed bracken. By this time the layers will have grown considerably and will benefit with mulching. Keep the stool-bed free from weeds at all times. As soon as layers have developed sufficient roots they should be parted from the parent plants with a pair of secateurs and allowed to remain for a short time before being lifted and planted into the nursery beds. All leggy layers should be pruned back to form more bushy plants.

With Rhododendrons used for stooling in this manner only one crop can be obtained, but with a well-established deciduous Azalea stool-bed, crop after crop is possible. To make such a bed, first-class Azalea plants on their own roots are most essential. The position selected must be in full sun, with rich lime-free soil of sandy composition, and completely free from perennial weeds. This is important as once the Azalea bed is established it can remain in the same position for upwards of fifty years, and with good culture produce a crop of layers every third year. If such a stool-bed is wisely managed one third of the bed of layers can be arranged to be ready the first year with the remaining two-thirds in subsequent years, giving a crop of layers continuously.

The Azalea plants should be planted in perfectly clean ground in rows 4 ft. apart and with 4 ft. between the plants in the rows. When well established the stool plants must be cut completely back to the ground level during early spring when young growths will be furnished from the base.

As these become about 2 to 3 ft. long by the following spring they are ready to be bent over and layered leaving just their tips showing above the soil. Some should be rooted in twelve months, but in two years all layers are ready to be removed; then the stools are again pruned back to the base, resulting in a further supply of shoots ready to go down the following spring.

This cycle of events can be made to rotate almost indefinitely providing the beds are kept perfectly clean of weeds, and the stools are well fed with good short manure and peat after each crop. As the stool plants become older and are kept well nourished, the harvest of young shoots becomes more plentiful and stronger with each crop. Treated in this way Azaleas root easily from young wood making good healthy plants which are to be preferred to layers taken from old wood which seems slow in getting away.

The dwarf alpine Rhododendrons may be easily increased by layering. Simply cover some of their lower branches with sufficient sandy soil to keep them stationary, while leaving a portion of the leading growths above the soil level.

## RHODODENDRONS FROM CUTTINGS

*The swinging bells of Rhodos, which glitter as they sway,*
*Are lovely things to "strike" and tend and grow to give away;*
*So mind you take some cuttings from all the plants that blow,*
*For there's not a single Rhodo that from cuttings will not grow.*

Few of the Rhododendron growers of this country really believe the words of the verse which I have written to commence this section. They do, we know, strike thousands of evergreen "Kurumes" and I was glad to see, while visiting several growers recently, that attempts were being made to root a much wider range of Rhododendrons; but not quite the full range that is possible.

I would not go as far as to say that all Rhododendrons are a commercial proposition when grown from cuttings, but I do know that quite a large number of species, together with their hybrids, do root easily enough to demand serious consideration. This means of increase is most important with many of the grand new hybrids, as only by vegetative reproduction can they be perpetuated. The writer, before the last war, had perhaps more than partial success with rooting most of the species of Rhododendrons and he firmly believes that it is possible to strike all Rhododendrons from cuttings.

When it is realized that as an experiment just one leaf of *R. sino-grande* was tested, and after a few weeks it produced plenty of roots, it certainly gives hope for the rooting of practically any from cuttings. The leaf was so large that it could not be placed in the propagating case in an upright position, and I well remember how I regretted having to cut such a beautiful, large leaf in half, leaving the bottom portion, which was 9 in. long and 7 in. wide, to be placed in a pot. This rooted curiosity was kept for more than a year, but as the leaf had no growth-bud attached when inserted, there was no possibility of its making a plant.

This experience has only been recorded to try and illustrate to growers that, given the right material and right conditions, cuttings of Rhododendrons will produce roots. To root the many *Philadelphus* species and their hybrids the propagator could make a tour of the garden one day during the summer months, gather cuttings of the complete genus, insert them, and probably obtain 100 per cent. success. This would be most unprofitable with Rhododendrons, as they differ tremendously in their behaviour; some commence to flower in January or February while the latest do not bloom until July or August.

With the exception of the "alpine species," all Rhododendrons are best grown from cuttings consisting of the current year's growth. When it is realized that these new growths do not break and grow until after the flowering period, it is obvious that it is impracticable to treat them all the same if first class results are to be expected. In these days of scientific discoveries it is not surprising that the scientist has come to the aid of the practical man with growth-promoting substances, both in liquid and powdered form, called "Hormones." I have seen and heard of good results from using either kind, for general propagation, and there is no doubt that these preparations do stimulate and accelerate the formation of roots on cuttings.

Although there is help to be obtained from these growth substances, the scientist cannot be wholely successful without the aid of the practical man; the two, I feel, should travel hand in hand and take all that each has to offer. Success in propagation will always attend the gardener with "green fingers," and the more difficult plants, trees and shrubs will still need the expert hand and expert knowledge. Unless we know the type of cutting necessary, and the correct time to take that cutting, we shall never succeed with certain difficult-rooting subjects, even if we soak our cuttings for a month in growth substances.

The successful propagator must study his Rhododendrons, and get to know them and their history thoroughly. For example, it would be disastrous to take hundreds of cuttings of the Lapponicum series and place them in a heated frame with bottom heat. The percentage of rooted cuttings would be very small, as the majority would damp off owing to the too damp and warm conditions. On the other hand the larger-leafed species, which come from lower and warmer altitudes, must have those warm, moist, closed conditions which are death to the Lapponicum series. Javanese Rhododendrons again, must, of course, have warm treatment to root, and grow well and are definitely warm greenhouse plants.

Here we have, then, this vast and most interesting genus of plants, all related, but all demanding more or less different

treatment if we are to be wholly successful in propagating them from cuttings. It is useless to take all on the same day; a matter of months separates the optimum time for inserting cuttings of species with such widely differing types of wood.

It might seem that I am endeavouring to make the rooting of Rhododendron cuttings appear very complicated, but this is far from my thoughts. The whole secret (if secret there be) of success is to remember that:

(1) The larger the leaf and wood of the plant the softer the cutting and the warmer the conditions needed.

(2) The smaller the leaf and wood, the harder must be the wood of the cutting and the colder the conditions for rooting.

All cuttings, if possible, should be taken from good, free-growing, healthy stock-plants. Should these plants be suffering from drought they should be well watered and allowed to recover before cuttings are taken. Propagating material received by post is best placed in water for a few hours and allowed to revive before insertion into their rooting compost. Personally I prefer to take soft cuttings of all shrubs early in the morning before the sun is hot, or during a dull misty day, as then the plants are at their maximum vitality. When making soft heel cuttings do not strain the cutting when separating it from the parent plant, but get the thumb well down to the base of the cutting and press downwards, at the same time holding the branch firmly with the other hand. These heel cuttings must be taken with discretion or the plant may suffer in consequence.

Three parts of good sharp sand, and one part of fine granulated peat make an ideal rooting medium for Rhododendron cuttings, providing arrangements are made to pot-off the cuttings as soon as they are rooted into the same compost as advised previously for seedlings. Good results have been obtained from a type of mica heated to expand to 10 to 15 times its original volume, producing a product which is highly absorbent and retentive of both air and water. This "Vermiculite," as it is called, is sold in various grades of acidity and alkalinity, and care is necessary to obtain the former type for Rhododendron cuttings, leaving the latter for the lime-loving plants.

After much experience I strongly advise placing the soft cuttings of the larger-leafed Rhododendrons around the inside edge of pots, rather than into the propagating bed itself. Such cuttings demand a moist and uniform atmosphere, a porous soil, and to be provided with bottom heat; they must not be permitted to flag at any time. The cuttings should touch the side of the pot when inserted, as the extra uniform drainage so afforded encourages the formation of roots.

With such easy rooting subjects as Kurumes, *R. malvaticum*, *R. obtusum* vars. *amoenum*, *japonicum*, and *Kaempferi* and their hybrids, together with the members of the large group of Azalea subseries Obtusum, there is little to be gained by using pots. These can safely be dibbled straight into the bed of the propagating case during the month of July, with every prospect of complete success.

With the larger soft cuttings, 2½, 3, 3½ or 4 in. pots, according to the size of the cuttings, will be found convenient to hold several in each pot, allowing a reasonable space between each cutting around the inside of the pot. Short, new current year's growths should be removed from the parent plants with heels attached, and if the cuttings are correctly selected, no removal of superfluous leaves will be necessary, as such cuttings will be found to be well balanced.

Where a large range of cuttings have to be struck a commencement with the very large-leafed ones would be necessary towards the end of June, others during July, then September and October, to finish up with the finer-leafed Lapponicum series during December. These smaller alpine Rhododendrons root very easily from firm, even two year old wood without bottom heat under bell-glasses in the cool greenhouse or on a shaded north border.

A summary of the times to take cuttings of the various kinds of Rhododendrons may be helpful; I shall not endeavour to give anything like a complete list, but sufficient, I hope, to serve as a guide to the propagator. It must be remembered that to give dates for the correct timing of cuttings of any tree or shrub is a rather dangerous undertaking, as in different years the seasons may vary as much as several weeks either early or late.

If an attempt is to be made on the series Grande, Falconeri, Fortunei, Arboreum and Irroratum, a brisk bottom heat will be necessary and the cuttings inserted about the middle of June. Edgeworthii, Azalea, Maddenii, Thomsonii, Barbatum, Campanulatum, and Stamineum series, with their hybrids, are best rooted in July with the aid of bottom heat. Cinnabarinum and Neriiflorum series containing such good plants as *RR. cinnabarinum*, *concatenans*, *Keysii*, *repens*, *catacosmum*, *chaetomallum*, *haematodes*, *pocophorum*, *neriiflorum*, *euchaites*, *sperabile*, *aperantum*, *dichroanthum*, *didymum*, *sanguineum*, *scyphocalyx* and many others are, in my opinion, best taken in August and early September. The large series Triflorum with *RR. Augustinii*, *yunnanense*, *Hanceanum*, *exquisitum*, *oreotrephes*, *Keiskei*, *lutescens*, *triflorum*, *xanthocodon*, *Davidsonianum*, *Searsiae*, and *siderophyllum*, all small-flowered free-blooming shrubs, strike well in late September or early October with slight bottom heat.

The Glaucum series, all with bent styles, root equally well during October.

Anthopogon, Cephalanthum, Campylogynum and Saluenense series, embracing *RR. calostrotum, prostratum, saluenense, crebreflorum, tsarongense, anthopogon, myrtilloides, Sargentianum, sphaeranthum* and *kongboense*, all dwarf treasures, root easily if taken late in October or early in the month of November and inserted around the inside of small pots, later to be placed in a cold house or on a north border under bell glasses.

Last of the Rhododendrons to be rooted are the thin-leafed Lapponicum series, including *RR. microleucum, chryseum, flavidum, impeditum, paludosum, fastigiatum, intricatum, microleucum, scintillans* and *telmateium*; all these may be taken during open weather in December with every hope of successful rooting.

I will not dwell longer on Rhododendrons from cuttings, except to add a few lines in deciduous Azaleas. These root easily enough from cuttings taken soft about the end of June or early in July, and placed in a propagating frame with bottom heat. The difficulty is not with the rooting, but when efforts are made to winter them. Should the apex of the cutting develop a flowering bud the plant usually fails to start into growth the following spring. When selecting cuttings it is wise to take the less strong ones as these may retain their growth tips. However, fair results are obtained by striking deciduous Azaleas in cold conditions under bell glasses during early autumn, and allowing them to remain until the following spring, but the best means of multiplication of these plants is by layering.

## THE GRAFTING OF RHODODENDRONS

Present-day Rhododendron propagation is a vast subject and to do justice to this paper I should write at length about the art of grafting. However, I am fast using up my space and time in this conference, and rather than write of different types of grafting I intend to give the majority of my space to a few suggestions on stocks. I have already mentioned earlier in this paper the adaptability of *R. ponticum* to a wide range of different *p*H values and types of soils. I think it is true to say that *R. ponticum* will grow successfully in a wider range of soils than any other Rhododendron. This obviously makes it most acceptable for grafting Rhododendrons generally. It has other advantages, being quite hardy, and having foliage easily identified should suckers develop at the base of the stock. This cannot be put forward as an excuse for the use of *R. luteum* as stock plants for the grafting of deciduous Azaleas.

Although we must, from a commercial point of view, accept

the grafting of Rhododendrons, the writer does not consider it necessary to graft Azaleas. Very little of this is done in this country, but Belgian and Dutch growers use this stock intensively, and the plants find a ready sale over here. I cannot agree with the theory that grafted Azaleas make better shaped plants than layers. If these layers are taken as they should be, from young maiden growths, they break low and make perfect plants. Suckers of *R. luteum* are very hard to distinguish from the grafted scion and should the opportunity be missed to remove the suckers when they are in flower, the chance has gone for another year, when by that time the suckers have more or less taken command. We have accepted in principle that *R. ponticum* is the best stock obtainable for the grafting of practically all Rhododendrons, but I am almost convinced that the possibility of incompatibility of stock and scion cannot be excluded when the grower wishes to graft a *R. sino-grande* or *R. Falconeri* hybrid.

Judging from my experience, there is no difficulty in making the union, as the scion callouses over quite easily, but afterwards the plant fails to grow satisfactorily. About the year 1938 the late MR. LIONEL DE ROTHSCHILD received a First Class Certificate for his most beautiful yellow-flowered hybrid, *Rhododendron* × 'Fortune' (*sino-grande* × *Falconeri*). At the same time he gave scions to some of the leading growers in this country. Now, eleven years afterwards, I do not know of a grafted plant from those scions which has grown well. At the end of March, 1948, I personally grafted three scions of this particular plant. Two were saddle grafted on *R. coryphaeum* of the Grande series and the other on *R. basilicum* of the Falconeri series. Unfortunately the stocks were just lifted from the open with small balls of soil attached, grafted and then plunged in granulated peat in the propagating frame. Yet all three calloused beautifully and have grown away well. This should prove most interesting, as at the moment they appear to have more leaves than the plant on Battleston Hill which was grafted eleven years ago.

Just the reverse is my experience with hybrids of *R. lacteum*. Many of the progeny of this glorious plant seem fastidious, yet at Wisley *R. lacteum* hybrids root-grafted on *R. ponticum* are wonderfully good healthy plants three years from grafting. I have mentioned these little experiences hoping it may give food for thought to propagators who may have to perpetuate, by grafting, some of these newer Rhododendron hybrids.

It was my intention to write at length about stocks for grafting as I am fully aware that some of our leading growers have of recent years had much difficulty in getting the success they anticipated with their grafting.

There is no doubt that some commercial growers are missing the old craftsmen—the dear old men who had lived in the same jobs all their lives. These experts of the profession worshipped the knife which did their work for them, and was that knife sharp! Perhaps the steel in those older days was better, it certainly kept a sharp edge longer than present-day knives. Today much is heard about a fungus which ruins the scions and makes them fade off, and to counteract this it is held that the *p*H of the potting soil and the plunging material must be 4·0 or below. The fungus concerned is *Phytophthora Cinnamomi* and seems to be well known in the United States of America, where it attacks the stock plants with disastrous results.

It is only natural, therefore, that growers in this country should be concerned when they notice their scions wilting after grafting, and that, if they observe any fungus, they think that it must be the cause of the trouble.

To date *Phytophthora Cinnamomi* has been little studied over here, and it seems to the writer most likely that the fungus on the scions of Rhododendrons in our establishments is a secondary agent, and that part of the trouble is bad workmanship caused by a blunt knife injuring the tissues of the cambium and thus preventing a perfect union.

There is no doubt at all that the condition of the stock has much to do with the take of Rhododendron grafts. This being so, more attention should be given to the selection of seed for grafting stock purposes. Do not gather the seed from any *R. ponticum* without due thought, for many growing plants will have been cross-fertilized with some other pollen.

Pay full attention to the growing of the young *R. ponticum* seedlings, which must be sown, pricked off, and grown-on under ideal conditions, and when potted and stood outside, they must be plunged to save watering and to keep them in an upright position so that they have every chance to form straight-stems, and to become well established in their pots before being brought in for working.

How often do we see *R. ponticum* stocks in small pots, just more or less thrown about—like so much rubbish. Left to look after themselves and only getting water haphazardly, during the hot summer months? These are the plants that will be carefully gathered up in the spring with the expectation of a high percentage of takes when grafted, but to get first class results from grafting Rhododendrons the operator must have first class material to work with. Some growers use the side graft when grafting their Rhododendrons, others like the saddleback best. Personally I prefer the latter; however, the most important thing to remember is to graft as low as possible, thus giving

much less risk of suckers, with a much greater chance of getting the scion in time on its own roots.

The most difficult times with Rhododendron grafting is the period immediately following the callousing over of the scions. Then pains must be taken to harden the callus off sufficiently, to enable the grafted plants to be taken out of the propagating case from the close conditions and bottom heat to be placed on open benches in the same house without flagging taking place.

It is of no use just hoping that all is well, dumping the whole lot on the open bench, and, in a day or so, rushing half of them back into the propagating case once more.

Every morning while the Rhododendrons are in the propagating frame the lights should be lifted to give a little air and to dry off the excessive moisture which accumulates on the glass. During the early weeks these should be up only long enough to be dried, but as the weeks pass so must the lights be lifted for longer periods, increasing to an hour each day.

After about six weeks many of the scions will have calloused over, and it is at this period that the propagator must be more than observant and study his plants almost individually. Continue to lengthen the lifting period of the lights daily to more than the hour, and at the same time keep a sharp look-out for the least signs of flagging. If this occurs, syringe the plants and close the frame immediately. On the other hand, if only a few suffer, these must be given a place on their own at one end where it will be possible to give them the warmer closed conditions for a longer period. As the lights are left off longer, so will the callus on the scions become harder, preparing the plants to be fit enough for lifting out and placing on benches in the same house. Failing this the lights on the propagating case may be removed altogether, leaving the grafted plants where they are. The selection of the wilting Rhododendrons must continue the whole time placing them with other members of their own category. "Patience and perseverance will overcome most difficulties."

## ROOT GRAFTING

Much has been written during recent years singing the praises of root grafting of Rhododendrons, yet to date I have not heard that it has been taken up commercially by any firm. The difficulty of procuring the necessary amount of suitable roots for stocks may be the cause of this, or the little extra time involved over the complete operation. With high wages to meet at the end of the week, experiment is certainly discouraged, but even if our nurserymen cannot entertain the thought of a graft without suckers, it certainly should appeal to private owners

of Rhododendron gardens, and to Botanical Gardens. Here the question of numbers and price of production does not arise. Root grafting is by no means a new form of grafting, and it can probably safely be argued that had it proved practical it would have been universally adopted years ago.

January and early February is the best time to root-graft, and it is therefore not advisable to continue right up to the end of March, which is possible with the usual mode of stem grafting.

A good supply of *R. ponticum* roots should be obtained and accommodated in congenial conditions, i.e., in a warm house, and covered with damp peat or moss, for on no account must the roots be allowed to become dry and hardened. These roots are readily procured at will under old *R. ponticum* plants in established thickets in woodlands of long standing. Should grafting time coincide with the destruction of large unwanted bushes of *R. ponticum* an opportunity is afforded to select really ideal portions. Try and obtain roots to correspond with the size of your scions and have a fair amount of fibrous roots attached. The thick part of the root to be used for the grafting must be cut down to an inch and a half above the bunch of fibrous roots. This is important as, after grafting and tying firmly with raffia, the graft is potted with the union beneath the soil. It is then placed in the propagating case with bottom heat of 60°–70° F. and treated in the same way as advised for ordinary grafting. Again the writer prefers to use the saddle graft for these roots, but many advocate the side graft. By so doing they consider the plant has a better opportunity of eventually becoming established on its own roots. In this method a small incision is made in the scion starting about half an inch above the basal end. The cut is continued upwards for a distance of nearly three quarters of an inch. Next take the root and cut the top into the shape of a wedge, which is pressed firmly into the incision in the scion. Care is needed to ensure that both cambiums meet perfectly. The union must be bound together with raffia or soft string, afterwards to be potted as if it were an ordinary plant with roots, bearing in mind the necessity of covering the union with soil.

## CONCLUSION

It is hoped that this paper will, perhaps, help some grower to perpetuate a beautiful hybrid or obtain the germination of a rare species or new hybrid. If this should prove to be the case, the author will be amply repaid for the time taken in writing the article.

## DISCUSSION

*The Chairman.* MR. HANGER has given us a very interesting talk. My experience with regard to propagation is that almost every propagator has slightly different ideas, and when it comes to the interpretation—even if they do the same thing—they very often differ as to why they do it.

FIRST QUESTION. In layering, do you believe in cutting away the layer eventually from the parent or leaving it until the last—in some cases about twelve or eighteen months—before cutting it away from the parent?

*Mr. Hanger.* It is advisable to cut it away from the parent and leave it in its established place quite a little while before removing it to your nursery or wherever you like to put it. You should not cut it away from the parent until it is well rooted. You can easily test when it is advisable to cut them away from the parent, but leave them in that position for a few more weeks, perhaps a month, before shifting. But you should never leave your layers on a plant—if it is a good hybrid—longer than a short time after they are well rooted. I am talking now, more from the amateur's point of view. When you put down layers on a plant and leave the layers there attached long after rooted, the parent plant deteriorates terribly. Again, if you leave the layers there after being cut off for too long a time they rob the parent plant of food, you should remove your layers away from the parent plant as soon as possible after they are well rooted.

SECOND QUESTION. Do you make an incision in the layer by cutting it in two, or do you make a light cut?

*Mr. Hanger.* No, I make no incisions at all. I have tried all ways, and I find—especially with the rough-barked Rhododendrons, provided they get that very abrupt turning—if you put down your layers (as advocated this morning) with the young growth, you can make that abrupt turning quite easily. By making an abrupt turning, you will, by that means, check the flow of sap and the plants start to grow and root quite easily. It is a real knack. Should you fail to make that really abrupt turning without stakes, I should advise you to have stakes. Of course, you can make that abrupt turning with the aid of sandstones, and the stone is a very good thing because it keeps the layer very moist. Hold them down with stones.

*Mr. Nearing.* How much soil do you put down on top of your layer? How deep is the branch in itself?

*Mr. Hanger.* Well, you would require a trowel and dig down in a scoop quite several inches. Get down to the moisture, it is no good just putting it a couple of inches under—not in sandy soil. You want to get down and make a real good scoop, quite 4 inches down.

FOURTH QUESTION. Propagating by seed—have you tried sowing them on sphagnum moss?

*Mr. Hanger.* Yes, I have tried all kinds of things and you can get good results on sphagnum moss, but I find that granulated peat is quite easy. No trouble at all. It is just child's play, and they do grow so very well in it and what is more, they live for years in it.

FIFTH QUESTION. Can I ask if you have had any experience of using sawdust as a mulch for Rhododendrons?

*Mr. Hanger.* Yes, there is a "for" and "against." I have heard about good results, but I have seen some very bad results, and I am not sure about it. I do know this much, that if you are keen to use sawdust, you must be very very careful. It must be old sawdust and, of course, it should be Oak or something like that—not the Fir type. But I myself do remember a nursery which was mulched with sawdust—new sawdust—only two or three years ago, and within six weeks the whole bed of layers turned yellow (the layers that had just been planted out) and the sawdust had to be raked off. I have heard from certain people that it is a very good thing when mixed with certain soils, but I have never found very much help from it.

*Sir G. Loder, Bt.* We have heard yesterday, that the Rhododendrons in their native habitats each select their particular bit of soil they like. I suppose you have got no reasons about the acidity of those types of soil to help us? Nothing is known about them?

*Mr. Hanger.* No; these different *p*H values for various species or various series are a thing we have not yet gone into. I, myself, think there is a lot in it. Of course, there does not sound much different between, shall we say, 5·8 and 3·8 but there really is a lot of difference—a tremendous lot of difference. The lower you go in acidity, the higher the percentage of differences. There is a far greater difference from 4 to 3·4, than it is from 5 to 4·4, but I cannot help you in your question. I have never read or heard about it. It would be very interesting too, very interesting.

SEVENTH QUESTION. At what age should the hybrid 'Fortune' flower? It should be approaching its flowering age at a size of about 6 or 8 feet. Should it begin to flower soon?

*Mr. Hanger.* Is that from seed?

QUESTIONER. No, it is graft.

*Mr. Hanger.* If it is grafted, there is nothing to stop it flowering right away, is there?

QUESTIONER. I have one at 6 or 8 feet that is already starting to flower.

*Mr. Hanger.* One that I grafted last year has a flower this year. If you take a graft or layer you have a portion of the old plant. If you have a seedling you have a new plant and you may have to wait twelve or fifteen years.

*Mr. Rose.* Mr. Chairman, I am not going to ask a question, but I am going to presume for two minutes to give some comments on the value of root grafting. I started root grafting about twelve or fourteen years ago, and the results of that grafting can be seen to-day. I think it is a very fine form of propagation. We know that *R. ponticum* is a hardy also a stronger rooting plant. I do not think that root grafting will ever be taken up commercially unless the nurserymen are more successful than I have been, because about 85 per cent. is the most I have ever got to take; but the results of those which have been grafted on to the roots of the *ponticum* are rather remarkable. I could show you at Townhill one plant of 'Loderi King George' which is 10 feet high, a really magnificent plant, which is growing in nothing but pure yellow clay, and I have many other Rhododendrons growing in similar soil to-day which have been root-grafted. I know that all species of Rhododendrons are not compatible with *ponticum* and possibly it is for this reason that those mentioned by MR. HANGER failed. But *lacteums*, *Wightii* and most of the hybrids grow very well indeed on the roots of *ponticum* and we have the additional advantage that we get no suckers, and I would strongly recommend, to anyone who has a Rhododendron garden, that special method of propagation.

*Dr. Bowers* of U.S.A. Mr. Chairman, with regard to an enquiry which was made on testing the *p*H of Rhododendrons in the wild, I would like to say that a number of tests made by DR. PARRY (?) and also the late DR. COLVILLE in the United States on the native Rhododendrons growing in the wild, indicate that the optimum range seems to be from about 4·5 to about 5·3.

There is this other observation also. The work of the physiologist DR. KNUDSEN, indicates that the solubility of iron salts in the soil, which seems to be the critical matter concerned in *p*H, varies with respect to whether the acid is an organic acid or whether it is an inorganic acid. In the case of an inorganic acid such as aluminium sulphate, the solubility of the iron salts only goes to a certain distance. For instance, with an iron salt in the ferrous or soluble stage, it will remain ferrous only to about 4·5 or a little higher, but with an organic acid it will go up one full *p*H higher and still remain in its ferrous condition.

NINTH QUESTION. Could you tell me how you lowered your *p*H in your experiments on hybrids, did you use aluminium sulphate or sulphur?

*Mr. Hanger.* We used aluminium sulphate, and we had to use it to the extreme to get, or try to get, a *p*H of 3·4. There it became absolutely toxic to the plant life, and all the Rhododendrons died off.

QUESTIONER. Sulphur itself would not do?

*Mr. Hanger.* We have tried flowers of sulphur, and MR. SLOCOCK has been using it a lot. It does bring down the *p*H greatly—flowers of sulphur added to the soil. I cannot tell you what the proportion is, but there is a test being made now by MR. HANNON of the Imperial College of Science, and by the end of this summer I believe we shall have all the answers to the amount of flowers of sulphur necessary to bring down the *p*H, shall we say from 4·6 to 3·6.

I would like to stress MR. ROSE'S few remarks about *Rhododendron ponticum* as a stock. At Wisley you will find on Battleston Hill Rhododendron 'Loderi' root-grafted on a *ponticum* about 3 feet high, in full flower with twelve fine flowers on them after four year. You will also find quite a lot of the better *lacteum* Hybrids which are being rather tiresome to grow on their own roots, upon this *ponticum* root stock. They are really fine healthy-looking plants. That may be the answer for good *lacteums*; instead of finding the low *p*H put them on the *ponticum* stock.

*The Chairman.* Well, we have had an interesting Paper and an interesting discussion. We might discuss here the matter of relation to *p*H for all day and all the week, but, as has already been indicated, when one speaks of the range of *p*H in normal soils, one is really dealing with a whole complex of phenomena. You not only have this extraordinarily wide

range of hydrogen ion concentration—and those figures MR. HANGER referred to are of course negative logarithmic numbers; when you speak of *p*H 3, of course you are dealing with a concentration of hydrogen ions which is 10,000 times greater than it is at *p*H 7, which is some difference! That is just one fact, this enormous range of hydrogen ion concentration, and there are corresponding changes in the reciprocals of hydroxyl ion concentration. The hydroxyl ions are important for some species, the hydrogen ions for others. But with these changes in concentration you have, as has already been referred to, the changes in solubility. At these low *p*H values, that is high acidities, you have high solubility of iron salts and of aluminium, and we know that plants vary enormously, even in the same genus sometimes—I do not know what it is in Rhododendrons—as to their tolerance of aluminium ions. Aluminium ions come within a comparatively narrow range with some plants in the change from toxicity to tolerance. In the same way, you have considerable tolerance for the "ions of iron" if you will forgive the use of that rather confusing phraseology. Then when you pass beyond the *p*H 7, you have increased availability for ions like molybdenum, which we know are necessary for plants, and of course, a decrease in the availability of ion salts, for instance the ions of iron, and also the ions of manganese. So the whole thing is a very complex picture, and I only hope that MR. HANGER will be able to analyse that very complex picture for Rhododendrons.

I am sure you wish to accord your very hearty vote of thanks to MR. HANGER for his interesting paper.

# HYBRID RHODODENDRONS

F. J. ROSE, V.M.H.

(*Paper read on April* 27, 1949, COL. THE LORD DIGBY, D.S.O., M.C., T.D., *in the Chair*)

THE present generation of gardeners owe a debt of gratitude to those early hybridists, who, previous to the 1914–18 war, had by patience and skill produced many very fine Rhododendron hybrids. They laid the foundation for the really wonderful display with which our gardens are adorned to-day.

It was my privilege to know two of those great men—MR. RICHARD GILL of Tremough, and MR. SMITH of Penjerrick. It was, I think, from them that I was instilled with the spirit to "Go and do likewise".

There are many to-day, all of course Rhododendron specialists, and I for one agree with them, that for quality of flower, and purity in colour no hybrid yet equals the species. I would also agree with the hybridists that in almost every case the hybrids make better general garden plants.

The publication of the first edition of MR. J. G. MILLAIS'S book on Rhododendrons in 1917, followed by the second edition in 1924, did much to encourage the culture of Rhododendrons, and also the work of the hybridists. There was a great spurt in Rhododendron hybridization immediately after the first World War, and it has continued to the present day, though of necessity the tempo has decreased since the beginning of the Second War. During this time hybridists have been helped and encouraged by the introduction of many new species through the efforts of FORREST, FARRER, KINGDON-WARD, ROCK and others, and to-day we owe an enormous debt of gratitude to these great explorers and collectors, for the display of Rhododendrons both of species and hybrids which are to be seen in our gardens.

The formation of the Rhododendron Association, now the Rhododendron Group of the R.H.S. and the introduction of the Rhododendron Log Book was a worthy step forward; the Log Book had, in fact, become a necessity. But in connection with the Log Book, a serious question arises, a question I have heard debated many times in private. It is decreed that the name under which the hybrid is first introduced must remain the name of all hybrids by that same cross. For instance the hybrid of *R. campylocarpum* × *Fortunei* was first introduced from Townhill under the name of 'Gladys', and all hybrids of that cross must in future be known as 'Gladys'. If a distinct and particularly good form is shown and gains an award later it must be known as R. 'Gladys' var. so and so. So we see that many plants may

rightly be called 'Gladys', the flowers of which may bear no resemblance to that which was originally exhibited under that name. A nurseryman may truthfully sell such plants as 'Gladys' but the buyers may be very disappointed when they find they are not from the plant which was first named 'Gladys'. I must confess I know of no real remedy for this difficulty, but I do think all vendors of plants should state definitely whether or not they are from the original plant.

All beginners in the task of raising hybrid Rhododrendrons soon notice that from the seedlings of many of the crosses made, there are one or two that are outstanding and far better than the remaining plants. It would seem wise in these cases for the raiser to harden his heart and destroy all but the best, instead of growing them on with a tag attached marked X. Y. or Z. It might avoid many disappointments to those who later wish to introduce that variety to their gardens. At Townhill we did on several occasions destroy such plants. The variety 'David', and another unnamed variety, a cross between 'Loderi' and the 'Earl of Athlone', are instances. These were outstanding plants and we destroyed all other seedlings, and I am glad we did so.

To obtain the best hybrids, the best forms of both parents must be used. Perhaps no one demonstrated this theory more successfully than SIR EDMUND LODER and those very fine forms of 'Loderi' will for ever bear testimony to his memory and to his wise selection of parents. The *Griffithianum* × *Fortunei* cross has been made on many occasions but no one has yet succeeded in getting the excellent result obtained by SIR EDMUND. We have a number of plants of that same cross at Townhill to-day but they cannot compare with the 'Loderis' of Leonardslee, except in scent. They are grown at Townhill especially for the scent, which is really grand. R. 'Loderi,' the best form of which is 'King George,' is perhaps the most famous of all Rhododendron hybrids.

An outstanding proof that in hybridizing one must use the best form of both parents comes to my mind. We crossed 'Loderi King George' with *discolor* and we also crossed an inferior and unnamed 'Loderi' with pollen from the same truss of *discolor*. The result was definite and conclusive. Seedlings from the 'King George' plant produced excellent forms of "Albatross"—one, pink in colour, was given the A.M. In comparison those from the unnamed 'Loderi' were poor and far inferior.

The theory is sound that for the best results at least one species should be used as a parent. With so many species and good hybrids available to-day, one may continue indefinitely to work on these lines, but the chance of producing a hybrid which is

better of its kind than any other in existence is getting more remote. I have been honoured to serve on the *Rhododendron Committee* of the R.H.S. for many years and I have often thought it unwise to give an award to a Rhododendron when only one truss is exhibited. We know that no member of the Committee would place a flower before his colleagues for an award unless the foliage, habit and growth of the plant was in keeping with the quality of the flower. But others might think only of the flower. I have raised plants that have given me very fine trusses of flower but the habit of growth and foliage have made the plants worthless for garden decoration. Had I placed an individual truss of those flowers before the Committee they might have given it the coveted award but it would have been wrong.

But it does not always follow that the crossing of two hybrids will produce nothing of value, though the chances are against it. R. 'Cretonne,' 'Mrs. C. Whitner,' 'Sunset,' 'Spring Beauty' are all excellent hybrids raised by MR. WHITNER at Leonardslee. They all gained awards but no species was used to raise any of them. 'Muriel Messel,' that excellent white variety raised by MR. COMBER at Nymans, was a cross of two hybrids—'Loderi' and 'Loder's White.' At Townhill we crossed 'Loderi' with the 'Earl of Athlone,' already mentioned in this paper, and grew on forty-three of the seedlings. Of these, forty-two were very poor—mainly pale pink in colour—and we destroyed them. The one seedling we kept produced a loose truss like its parent 'Loderi' but in colour it was a slightly deeper crimson than even the 'Earl of Athlone.' It is very floriferous and I believe it to be a first class garden plant. Several plants of it have been distributed, and I was pleased to see one last year showing up well in Windsor Great Park. That was the off-spring of two hybrids.

Some excellent results have been obtained by using the pollen of the first generation back on to one of its parents. Perhaps the most famous are 'Lady Chamberlain' and 'Lady Rosebery'—both F.C.C. plants. They were raised by the late MR. LIONEL DE ROTHSCHILD at Exbury, and what is known as the 'Lady Chamberlain' and 'Lady Rosebery' walk at Exbury is a very fine sight indeed when the plants are in flower. The cross was *R. cinnabarinum* var. *Roylei* × 'Royal Flush.' 'Royal Flush' was raised by crossing *Roylei* with *Maddeni*, so that it was a case of inbreeding. We made the same cross at Townhill, but we used the 'Royal Flush' on a small flowered and compact growing form of *Roylei*. The result was a similar range of colour to the Exbury, but the Townhill plants had somewhat smaller flowers, made more compact plants and are I think generally hardier. It was a very pleasing batch of hybrids.

Another excellent hybrid raised at Exbury from 'Royal Flush' is 'Lady Berry.' In this case 'Rosy Bell' was the seed bearing plant. Those members of the Rhododendron Group who visited Exbury last year will remember the beautiful sight these plants presented. Many of us were of the opinion that 'Lady Berry' was the pick of the Exbury collection at that time. The flowers are shaped similar to 'Lady Chamberlain' and if my memory is correct, pinkish in colour. It should be noted this is a hybrid of two hybrids.

The variety 'Marcia' was raised in a similar way to 'Lady Chamberlain.' The cross was *R. campylocarpum* × 'Gladys' var. 'Mary Swaythling.' 'Mary Swaythling' is a hybrid of *R. campylocarpum* × *Fortunei*, and is cream in colour. Our aim was to obtain a hybrid similar in colour to *campylocarpum*, and 'Marcia' is one of the very few instances when the hybridist obtained that for which he aimed. The hybrid is of a slightly deeper colour than *campylocarpum*, the habit of the plant ideal and it is very floriferous.

At Townhill we used *R. campylocarpum* quite a lot as a parent and the results were always good and interesting. The original 'Gladys,' mentioned earlier in this paper, was introduced first from Townhill but the plant was actually raised in COL. STEPHENSON CLARKE'S garden at Borde Hill. We made a similar cross, using a good deep coloured form of *Fortunei*, and crossing with *campylocarpum elatum*. From that cross we obtained a very fine range of seedlings—in colour from cream through to deep pink, and the habit of the plants is ideal.

One of the finest of all *R. campylocarpum* hybrids is 'Lady Bessborough.' This was obtained by crossing *R. discolor* with *campylocarpum elatum*. It was first introduced from Exbury in 1933—a fine cream coloured flower with a bright red base and it was awarded a F.C.C. We made the same cross at Townhill and our plants flowered about two years after those at Exbury. The results were similar. The plants flower rather late in the season, due to the influence of *R. discolor*, and I have never known them to be injured in any way by frost. To see these plants in flower is a sight to be remembered.

Another first class garden plant was obtained by crossing R. 'Luscombei' with *campylocarpum*. This again was first introduced from Exbury in 1935 and was named 'Cremorne.' The cross was also made at Townhill and the best of the plants, an outstanding one, was given the A.M. Unfortunately and for no apparent reason the plant died the same year before we were able to propagate from it and so was lost for ever.

*R. campylocarpum* × 'Dr. Stocker' produced many good

coloured hybrids including some bright yellows. The hybrid was named 'Damaris' and a yellow form gained the A.M. in 1948. I think this plant was raised at Logan. Our experience is that the cross gives good coloured hybrids, but the plants, both in habit and growth, are not good for garden decoration.

As one would expect 'Loderi' has been used extensively as a parent. Crossed with *R. decorum* we get 'W. Leith' A.M. a very fine white. 'Muriel Messel' I have already mentioned, and there are a large number of other excellent hybrids. The President introduced R. 'Coronis' in 1933—a cross of 'Corona' and 'Loderi.' We made the same cross at Townhill in 1926 and the plants flowered about the same time as the Bodnant ones. One or two of these are outstanding and amongst our Grade A plants. The trusses are large and very deep; the colour a bright pink, and the flowers tightly packed together. I have never put them before the Committee but have always thought them worthy of an award.

By the way, R. 'Corona' is a comparatively old hybrid, and obtained the A.M. in 1911. We found it a good parent and used it in conjunction with *Souliei*, *Griersonianum*, *discolor*, *campylocarpum*, 'Queen o' the May' and *Thomsonii*.

Perhaps the species most used for hybridizing in recenty ears is *R. Griersonianum*. The introduction of this species gave the hybridists a grand opportunity which they were not slow to accept. It crosses readily and its striking colour, described as Geranium red has helped to produce some of the best coloured hybrids to be seen to-day. Our President used it a good deal and so became famous for the red hybrids he exhibited so well. One cannot name any of the hybrids of *Griersonianum* without leaving out many that are probably quite as good, and they are so numerous that if I attempted to mention all of them there would be no more speakers at this Conference. The colour of all these hybrids is excellent, but in some the trusses are too loose and floppy. Among the most popular I would include 'Fabia'—first introduced by the President in 1933. This is a delightful dwarf hybrid—the second parent being *dichroanthum*. 'Arthur Osborn' —a deep red, late dwarf hybrid, raised at Kew and introduced in 1933. The other parent was *didymum*. 'Tally Ho' is perhaps the most famous of all *Griersonianum* hybrids, and was introduced first in 1933. Pollen of *eriogynum* was used in this case and seedlings were raised simultaneously by MR. J. J. CROSFIELD of Embley Park and LADY LODER of Leonardslee. The name denotes its brilliant scarlet colour, and it ranks among the finest of all hybrids.

'May Day' was introduced in 1932 by MR. A. M. WILLIAMS—*haematodes* being used. A really excellent medium hybrid with

bright red flowers. 'Romany Chai' was raised at Exbury by crossing *Griersonianum* with 'Moser's Maroon.' It is deep red in colour, and the plant is of medium size and rather loose in habit. 'F. C. Puddle' is one of the most famous reds from Bodnant, *neriiflorum* being used with *Griersonianum*, another magnificent hybrid.

All the hybrids of this famous species I have mentioned have been given either the A.M. or F.C.C. and there are many others. I regret I have no time to speak of them.

Another fine lot of hybrids the Rhododendron Group saw at Exbury was R. 'Hawk'—the parents being *R. Wardii* × 'Lady Bessborough.' These are yellowish in colour and the plants are intermediate between the two parents. The hybrid is excellent for garden decoration. (Fig. 21.)

'Margaret Dunn' is a good rather late flowered hybrid of *R. discolor* × 'Fabia.' It has the 'Fabia' colour—flushed Apricot—and the plants are of medium height and good foliage. It was raised at Townhill and gained the A.M. in 1946.

Apparently most of the hybrids raised prior to the 1914–18 war were of the larger growing kinds, the species used being *Griffithianum*, *Thomsonii*, *arboreum*, *Fortunei*, *barbatum*, and *campylocarpum*, plus some of the old early hybrids. 'Penjerrick,' described by LORD ABERCONWAY as the most 'lovely of all Rhododendrons' is a hybrid of *campylocarpum* × *Griffithianum* raised by MR. G. SMITH of Penjerrick. MR. GILL used *arboreum* a good deal and he told me he had great faith in it for hybridizing.

I saw in Cornwall some very pretty and interesting *arboreum* hybrids, and I have no doubt they are excellent in that Western Rhododendron Paradise. In Hampshire where, in the early part of the year it is often the extreme opposite to Paradise, they flower too early and at Townhill may be a success about one year in ten. It is worth growing many of our best plants if they are a success only one year in five. One in ten is too much for the patience of most gardeners including myself.

Of these *arboreum* hybrids I may mention 'Gill's Triumph,' A.M. 1906; 'Beauty of Tremough' F.C.C. 1902; 'Glory of Penjerrick,' A.M. 1904; and 'Glory of Leonardslee.' These have been planted twenty years at Townhill and have flowered really well once only. So in our hybridizing we left *arboreum* severely alone.

Some hybrids may improve in character from the first year of flowering. We crossed *R. cinnabarinum* var. *Roylei* with *R. oreotrephes*. The flowers came similar in shape to *cinnabarinum* and purplish in colour. When it first flowered I thought it very

poor and took no further interest in it. The plants are now from 4 to 7 feet in height, flower freely and I think it a very pretty and interesting hybrid.

Much interest has lately been taken in the dwarfer hybrids and I well remember a border at Exbury of 'Berryrose'—a *dichroanthum* × 'Doncaster' cross. It was one of the prettiest sights I have seen, and it prompted me to go home and make the same cross. The plants of this hybrid grow 3 to 4 feet and the colours generally are orange.

'Nereid' is a hybrid of *R. dichroanthum* × *neriiflorum*. I saw it first in the Sunningdale Nurseries and I believe the plants I saw there were in truth a natural hybrid. It is a plant for the front row and the colour is orange-red, very striking and dominant. The manager of the Nurseries, that most beloved of gardeners, MR. HARRY WHITE, was particularly fond of that hybrid and one had to be a great friend of his to obtain a plant. I was one of the favoured ones and my plant did well. From it I saved some seed which had been self pollinated, and from that seed we obtained plants ranging in colour from pale pink to sealing-wax red. They are perfectly hardy, maximum height 3 feet and some of the most fascinating of the dwarfer Rhododendrons.

A very popular group of small flowered hybrids are the blue ones—' Blue Tit', 'Blue Diamond,' and 'Bluebird.' Of a class by themselves, it is difficult to say which is the best and most popular. There is room for all three in every Rhododendron garden. 'Blue Tit' was raised by the late MR. J. C. WILLIAMS and first exhibited in 1933. It is a hybrid of *R. impeditum* × *Augustinii*. It is a compact, close growing shrub which may reach a maximum of 3 to 3½ feet. When I first saw it I thought it a very fine plant.

Then in 1935 the late MR. J. J. CROSFIELD introduced 'Blue Diamond' and it was given the A.M. In 1939 he exhibited a much deeper and better coloured form and this was awarded a F.C.C. It is a cross of *R.* 'Intrifast' × *Augustinii*, of upright and rather thin growth and a good deep blue colour.

In 1943, our President, LORD ABERCONWAY, came along with 'Bluebird,' and it was given the A.M. It is a cross of *R. intricatum* × *Augustinii*. My plants of 'Bluebird' are as yet only small and so I cannot comment on the growth. As I saw it exhibited and in comparison with 'Blue Diamond' and 'Blue Tit,' I thought 'Bluebird' the best of the three. Theoretically it should be, for *intricatum* is a better plant than either *impeditum* or 'Intrifast.'

Another first-class blue hybrid is 'Electra.' This is of larger growth than the three mentioned and is a hybrid of *R.*

*chasmanthum* × *Augustinii*. It was raised at Exbury and exhibited in 1940 when it received the A.M. It is a good blue in colour, very floriferous and a first-class garden plant.

*R. repens* has been used extensively and has provided some really beautiful hybrids. They retain much of the dwarf habit of *repens* and are far more floriferous. I must mention six of the most famous of these—all of which have scarlet to crimson flowers. From Bodnant we get 'Elizabeth,' a cross of *R. repens* × *Griersonianum*, and 'Ethel,' produced by R. 'F. C. Puddle' × *repens*. These are both F.C.C. plants. Exbury provide us with 'Carmen' A.M.—a cross of *R. didymum* × *repens*—and 'Jaipur' —*R. repens* × *Meddianum*. 'Little Ben' and 'Little Bert' were introduced by MR. SCRASE-DICKINS, and I would also call them both Little Gems. 'Ben' is a F.C.C. plant of *neriiflorum* × *repens* 'Bert' has the A.M. and is a cross of *R. euchaites* × *repens*. I can vouch for the excellent qualities of these two hybrids for we raised and grew them both at Townhill.

Another very fine deep red hybrid is R. 'Red Cap,' the offspring of *R. didymum* × *eriogynum* introduced from Tower Court by our chairman MR. J. B. STEVENSON. This is a very fine hybrid which attracts the attention of all who see it. It should be planted where the afternoon sun shines through it—the whole bush then appears as on fire. The Townhill form of 'Red Cap' received the A.M. in 1945.

Another dwarf hybrid I must speak of is 'Temple Belle'—introduced from Kew Gardens in 1916. It is a cross of *R. Williamsianum* × *orbiculare*. It is a close growing plant with a maximum height of about 2½ feet quite hardy and a good pink colour. We made the same cross with an interesting result. About 80 per cent. of the plants were dwarf and typical of 'Temple Belle.' The remainder were tall growing, even more so than *orbiculare*, and a much deeper colour than that species. Of the two I would prefer the tall growing form. In our efforts to raise dwarf growing hybrids we found the following species useful —*apodectum*, *didymum*, *eriogynum*, *phoenicodon*, *Souliei*, *scyphocalyx*, and *Wardii*.

Before passing from the dwarfs, I must mention five hybrids of *R. moupinense* origin, not raised at Townhill, all of which have been given the A.M.

*R. moupinense* × *ciliatum* and we get 'Cilpinense' from Bodnant.

With *praecox* we get 'Tessa,' introduced by MR. J. B. STEVENSON.

With *lutescens*—'Bo-peep' from Exbury.

With *leucaspis*—'Bric-à-Brac,' also introduced from Exbury.

With *tephropeplum*—by MR. ADAMS-ACTON and we get 'Ailsa-Jean.'

The Woodland Garden at Townhill is too exposed to grow the large-leafed species of Rhododendrons really well. *RR. Falconeri, eximium,* and *sino-grande* are all planted there and flower fairly well. *R. grande* was never a success. In Cornwall one sees these and more tender species grown to perfection. So I made no attempt to hybridize them—I left it to the Cornish growers and I believe they have produced some good results.

Rhododendrons are easy subjects to cross-fertilize. Most beginners commence in a haphazard way and are pleased with almost everything they produce. It was so with myself; but one soon begins to make a deeper study of this fascinating subject and to work on definite lines with a definite object in view. As stated before in this paper, one seldom obtains that which one actually aims for, but if disappointed in this respect, one can, when working on carefully thought out and definite lines rely on getting something good and worth growing.

By the end of 1938 we had made just over 400 different crosses at Townhill. Many of these, especially the early ones, were of little or no use. On the other hand they included some excellent hybrids. In this short paper I have spoken only of the best of those we raised with a few which I have seen and admired in other gardens. I will mention no more for I think a catalogue of names is boring to an audience and conveys little of interest. In 1939 we made a considerable number of carefully thought out crosses from which we expected good results. Then came the second World War and we were compelled to abandon practically all work on Rhododendrons, Lilies and other ornamental plants and concentrate on food production. We did, however, sow the 1939 seeds, and the plants were put into nursery beds. They received no further attention, became over-crowded and suffered from drought. As a result we lost many of those crosses. Townhill has since been sold and very many of the plants I prized so much are now distributed over the country. Quite a number have been sent to America. They are just a pleasant memory to me now and I can only hope they are giving their present owners as much pleasure as they gave me.

It is interesting to record that I sent seed of most of the 1939 crosses to a correspondent in Seattle, Washington. He was successful with them and it is pleasing to know many of those hybrids are now popular in America.

I will not attempt in this paper to record the names of those owners of private gardens, and their gardeners, who have helped in the production of hybrid Rhododendrons. As may now be

*Photo, J. E. Downward*

RHODODENDRON AWARDS

FIG. 21—*R.* 'Hawk' A.M. May 24, 1949, raised by the late Mr. Lionel de Rothschild and exhibited by The Commissioners of Crown Lands, Windsor (See pp. 93 and 187)

*Photo, J. E. Downward*

RHODODENDRON AWARDS

FIG. 22—*R.* 'Jibuti' A.M. June 14, 1949, exhibited by Edmund de Rothschild, Esq. (See p. 188)

seen, it would be an almost impossible task. I am but one of the very minor ones and so feel I may close with a tribute to all who have assisted in raising what, to my mind, are amongst the most beautiful and accommodating plants of our gardens.

I would finally comment that if I was to become the owner of a small garden and restricted to only one Rhododendron, the one I would choose, from all I have raised myself or seen in other gardens, would be that grand old hybrid, A.M. 1911, 'Loder's White.'

## DISCUSSION

*The Chairman*, in introducing MR. ROSE, spoke very highly of his personal skill in hybridizing Rhododendrons and emphasized how much he had done in this connection when, for so many years, he looked after LORD SWAYTHLING'S famous garden at Townhill near Southampton. LORD DIGBY also said he thought MR. ROSE had a special flair for choosing the right parents and hybridizing in the right way, and that hardly anyone has produced better Rhododendron hybrids than he has at Townhill.

FIRST QUESTION. I am sure that I misunderstood slightly. Did you say that all Rhododendrons crossed with each other freely? I am sure you did not, but I am afraid some people may have had the impression that you said that.

*Mr. Rose.* I did say they hybridize freely, yes.

QUESTIONER. I do not think you meant the lepidotes and elepidotes, non-azaleas and azaleas?

*Mr. Rose.* I agree. I was thinking only of those which, botanically, it is possible to hybridize. But it is interesting to note—I have on occasions tried to do the impossible—for instance, to cross *R. Augustinii* with one of the large flowered kinds. Seed pods have developed and fertile seed formed, but no cross-fertilization has taken place. The seedling plants proved true to the seed-bearing species, but many extra good forms have occurred. I can give no reason for this and there can be no botanical reason for it. It is just a plain fact and I assume those fine forms came by chance.

SECOND QUESTION. When you mentioned mulching with bracken, I presume you meant dead bracken, not the green?

*Mr. Rose.* Yes, the best time to cut it is when the bracken is going brown in the autumn. Do not wait until it is very brown, but cut it and put it round the plants straight away. From my experience, I have often said that if a Rhododendron were dug up and put on a gravel walk and mulched with

about 4 inches of bracken each year, that Rhododendron would grow, and grow well.

QUESTIONER. One other point. Has any hybridization been done with *R. auriculatum* to try and extend the flowering season?

*Mr. Rose.* Yes, quite a deal. One of the best hybrids I believe of *R. auriculatum* is called 'Polar Bear.' It does take the season well on. But after all, do we want to extend the season of Rhododendrons? Frankly I do not think we do.

QUESTIONER. It becomes a bit bare by the end of July and August when the Primulas have gone and the Rhododendrons have gone.

*Mr. Rose.* Yes, but I also think that when it gets to about the middle of June, the interest in the genus goes, and for my own part I do not want to extend the season any longer than it is now.

THIRD QUESTION. MR. ROSE just now mentioned raising *R. dichroanthum* crossed with *R. neriiflorum*. Has any satisfactory result been obtained from getting a second generation from other crosses? There is an interesting blend of character there.

*Mr. Rose.* I cannot give any instances except one very fine example of R. 'Loderi' being raised from the second generation in that way. I exhibited one in London and it got an Award of Merit. It was named R. × 'Julia,' it came a pure pale yellow 'Loderi,' quite as large, and a very fine flower. I should think that MR. PUDDLE and others who have hybridized have also found that a second generation will produce some really good things.

FOURTH QUESTION. I was very much interested in your comment on the naming of Rhododendrons, because there is considerable interest in the United States. At the present time, in fact, there is a Committee of the American Rhododendron Society that studies the problem. We have unfortunately quite a good many types of things being sold, in some cases inferior seedlings, under the name which had been previously given to that cross. Of course in the United States with other horticultural types, other horticultural material, woody material particularly, the variety of names are given only to forms, and so the average gardener in the United States, when he buys a variety, thinks that it is a form, and so it has been very confusing to have a number of different forms of certain Rhododendrons being sold under one name. And the feeling over there, I think, is very strongly that in

some way there should be code names rather than these group names, whose varieties can be sorted out, and we hope to have some kind of code or something of that kind going out, which we would be very glad to discuss with a group over here. Perhaps some uniform system of getting around that difficulty could be worked out.

*Mr. Rose.* Yes. I am very glad indeed to hear you mention that, because, as I tried to point out earlier in my paper and in my talk, these groups of seedlings—I must go back to the same illustration of 'Gladys'—can be, and are, very confusing. I can well understand buyers in America ordering or asking to be sent out a certain number of 'Gladys,' but unless they had a guarantee that those plants being sent out were from the original A.M. plant, the buyers might get any seedlings of that group, and the nurseryman in this country who sent them out, would be perfectly honest in describing all those plants as 'Gladys.' But it would not be what was expected in America. That is a proof that there should be some very definite ruling on the matter.

FIFTH QUESTION. If you have chosen two plants that you want to cross, how do you decide which is to be the seed-bearing one?

*Mr. Rose.* If I were crossing a species by a hybrid, I would always choose the species to be the seed-bearing plant. But I am not sure that it makes a great deal of difference which you choose as your seed-bearing plant. We usually make the cross both ways so that both parents are seed-bearing.

SIXTH QUESTION. Could I offer a suggestion? You said that it was desirable to cross two species. Now, MR. ROTHSCHILD I know was very strongly of that opinion, and repeated it again and again. It is desirable from this standpoint: if you want a lot of fine progeny and very few poor ones, then it is desirable. But when you cross two natural species, you get a progeny which is rather uniform, if those species are fixed and definite species. If they are species in a state of flux, such as those in the Neriiflorum series, you are likely to get more variation, but on the whole you get rather uniform results. But on the suggestion of some British writers I made a study of the possibilities of secondary crossing, and it is my firm opinion that the way to get a supremely fine result is to cross, not two species but, having crossed two species such as *campylocarpum* and *Fortunei*, to cross two other species such as *Griersonianum* and *eriogynum*, and then to cross those two primary crosses together; and when you do

that you get the Mendelian split-up in which all the characters are recombined. I said all—I should say many of the characters, because some of the characters apparently will not distribute themselves; but you get a recombination of characters, with the result that some of your seedlings are utterly worthless, many of them are far below average and they are in many cases totally different in all respect, but you have the possibility of a supremely beautiful result in some cases. You must expect to throw away 95 per cent. at least of the progeny, but of the remaining 5 per cent. you are likely to get something very extraordinary, and something very different from anything you have had before. Would you agree with that?

*Mr. Rose.* Yes, I am very glad to hear your comment on that. It was not a subject I intended to touch on this afternoon, because I believe that my colleague who is following me will deal with that side of the question. But I am very glad to hear your comment on it, as indeed I am sure he will be too.

*The Chairman* then proposed a very hearty vote of thanks to MR. ROSE for his extremely good lecture which he was sure was of the greatest interest to all his listeners and also for the excellent slides he showed.

(This was agreed to with applause.)

# GARDEN HYBRID RHODODENDRONS

O. C. A. SLOCOCK

(*Paper read on April* 27, 1949, COL. THE LORD DIGBY, D.S.O., M.C., T.D., *in the Chair*)

AS there are two papers on the subject of Hybrid Rhododendrons being published at this Rhododendron Conference, let me explain now that this paper is being written from the point of view of the enthusiast with moderate sized garden in normal inland conditions and from the point of view of a nurseryman.

The term 'Hardy Hybrids' usually used in connection with the list of hybrids of no known parentage generally catalogued, is fast dying out, and it would not admit of progress if the carefully planned hybrids of to-day did not replace many of the early ones as general hardy plants. Hardiness is of course only a matter of degree, and is well described by the lettering in the Rhododendron Handbook.

It is obvious that certain key species and hybrids will have to be mentioned in both papers but so far as possible, we have endeavoured not to bore readers by repetition.

## HISTORY

The earliest species of importance that appear to have been available to plant raisers were :—

*Arboreum*

Three forms—blood red, pink and white—the blood red form, however, is very tender.

*Campanulatum*

A hardy shy flowering nearly blue Rhododendron.

*Catawbiense*

Very hardy purplish red, purple or white.

*Caucasicum*

A hardy blush, white or pale yellow, of dwarf spreading habit.

*Cinnamomeum*

A white form of Arboreum.

*Maximum*

A hardy white with yellow or greenish eye.

*Ponticum*

The common lilac Rhododendron which now grows wild in many of our woods.

Some of the first crosses of these plants are still good garden hybrids, three of them especially :

'Nobleanum' (Standish & Noble, 1835). *Caucasicum* × *arboreum*. There are several forms including red, pink and white—this Rhododendron received the Award of Garden Merit as recently as 1926.

'Lady Eleanor Cathcart' (J. Waterer). *Maximum* × *arboreum*. A fine tall growing clear pink.

'Cunninghami' (Cunningham, 1850). *maximum* × *cinnamomeum* A close growing very hardy white, grown extensively in the industrial North and Midlands, where it thrives in smoky districts.

One of the earliest lists of Rhododendron hybrids that we have in our possession is from a tattered Trade catalogue of about 1850 which bears the name of 'George Waterer' late of WILLIAM JACKMAN and at Goldsworth 'Old' Nursery, which shows forty-seven hybrids, six of which we are listing in our trade catalogue now and one—'Fastuosum flore pleno' a double mauve—is still a best seller and very rightly so.

It may be interesting to note the prices of 18/– to 24/– dozen.

An earlier list in 1839 shows that twenty divergent types of *ponticum* were being grown as separate sub-species, mainly due to difference in leaf.

ANTHONY WATERER was the great pioneer of the garden hybrid and the fine drives and specimens at Knaphill Nursery still pay tribute to his fine work. As the red *arboreum* was too tender for Woking he had no true reds with which to work. It is small wonder therefore, that nearly all his so called reds—'The Warrior', 'Chas. Dickens' 'Atrosanguineum'—have a purplish tinge, but the best—'Doncaster' and 'B. de Bruin'—are still favourites. ANTHONY WATERER must have flowered many thousands of seedlings to select this range of hybrids. His objectives were hardiness, good growth and a tall conical well-furnished truss with no bald top.

Many of his hybrids have the distinct yellow, orange, green or purple "eye" inherited from *maximum*, which gives the appearance of the flowers having a large insect on them.

His range of Purples, Lilacs and Whites is still supreme and with a few additions they are the best garden plants in their range of colour.

In purples we have, besides 'Fastuosum fl. pl.', already mentioned :

'Purple Splendour'. A rich blue purple with dark eye, is too well known to need description.

'Joseph Whitworth'. A red purple of handsome growth.

'Cetewayo'. So dark as to be almost black.

'Mrs. Davis Evans'. A nearly blue hybrid with red stamens.

'Lady Grey Egerton'. A silvery mauve and half-parent of Slocock's 'Lavender Girl'.

to mention just a few: and if we add 'Susan'—WILLIAM'S *campanulatum* hybrid, a first class lavender blue, WATERER'S (Bagshot) 'Blue Peter' or SLOCOCK'S 'Blue Ensign' which are similar, and ROTHSCHILD'S 'A. Bedford' (raised by LOWINSKY) a pale lavender with a dark eye, you have the best garden hybrids in those shades which are fast coming back into favour to plant with the new cream, yellow and pale orange hybrids, with which they blend so well.

The true blue Rhododendron of normal growth and habit has still to be bred.

Of his many whites, I should choose 'Mrs. A. Waterer', 'Mrs. Lionel Rothschild', 'Mrs. J. G. Millais' and 'Sappho' as being among the best and worth a place in any garden. The last named is most distinct with its dark eye. One cannot pass without mentioning those outstanding pink garden hybrids raised at Knaphill :

'Mrs. Philip Martineau'. A pink with a distinct green eye which renders it most attractive.

'Mrs. Furnivall'. A pink with a brown eye.

'Souvenir of Anthony Waterer'. A salmon with yellow eye and particularly tall conical truss.

As a result of the pioneer work of ANTHONY WATERER, others entered the field and were soon producing garden hybrids of merit. WATERERS of Bagshot produced one of the most outstanding novelties in the form of 'Pink Pearl' about 1900, which is still one of the most widely grown hybrids and too well known to need description. Its sport—'Mother of Pearl', I consider one of the best of its class.

'Pink Pearl' has been crossed extensively by English and Dutch nurserymen, but few improvements have been made, 'Countess of Derby' (synonymous with 'Professor Hugo de Vries'), 'Cynthia' × 'Pink Pearl' and KOSTER'S 'Betty Wormald', being the only outstanding ones. We have tested a later batch of seedlings from Holland with the obvious 'Pink Pearl' blood in them, but there appears to be nothing of note among them.

WATERERS (Bagshot) used 'Mrs. E. C. Stirling' to produce some fine large-flowered tall-trussed pinks such as 'Monstrous,' 'Jupiter,' 'Ajax,' 'Philip Waterer,' and 'Starfish.' I prefer the last named with its smaller curled-back flowers like its namesake. A number of reds of rather better colour than the old ANTHONY WATERER types while retaining a lot of their hardiness were introduced, some of the most notable being 'Princess Elizabeth,' 'Mars' and 'Pygmalion.'

The general character of these hybrids is that first and foremost they are plants that can grow in any Rhododendron garden, though perhaps not so bone hardy as the ANTHONY WATERER hybrids. If I were to pick only one plant from their hybrids it would be 'Corona'—a neat bush with delightful pink flowers borne in tall conical trusses. This plant has been used a lot in hybridizing to produce among others 'Sir J. Ramsden' ( × *Thomsonii*) and 'Ladybird' ( × *discolor*).

During all this time the Dutch nurserymen produced many outstanding garden Hybrids. ENDTZ specialised in crossing 'Pink Pearl' with the older and hardier sorts: VAN NES and KOSTER introduced tender blood into the very mixed parentage of the older varieties and, as may be expected, colour and form improved at the expense of hardiness. However, some of the reds produced are among the best garden hybrids—VAN NES introducing 'Earl of Athlone,' 'C. B. Van Nes' and 'Britannia,' from among a long list of hybrids of lesser repute. Of these three, the 'Earl of Athlone' is the best colour, but 'Britannia' the best garden plant. All three have been used as parents, but I can only recall two hybrids of any merit from them—one a seedling of 'Loderi' × 'Earl of Athlone' mentioned by MR. ROSE and raised at Townhill, and the other cross of 'Britannia' with *Elliottii* (ROTHSCHILD), the best plant of which is a magnificent tall growing scarlet named 'Leo.'

KOSTER'S most notable plants are his pinks—'Betty Wormald' and 'Mrs. G. W. Leak' and his cream *campylocarpum* hybrids 'Zuyder Zee,' 'Harvest Moon,' and 'Adriaan Koster' (but *campylocarpum* will be mentioned later.)

DEN OUDEN produced a range of very hardy but rather ugly hybrids which have found some favour in very cold parts but are not generally considered worthy garden plants in an average English climate.

During this time, SLOCOCK'S had commenced crossing. At first *campylocarpum*—HOOKER'S variety—was used with many of the older hardy hybrids and resulted in a collection of hardy close growing plants with well formed trusses and the hitherto unusual shades of cream, peach and apricot. Of the many plants, the

most popular are 'Goldsworth Yellow' (*caucasicum* × *campylocarpum*), 'Unique,' 'Dairy Maid,' 'Souvenir W. C. Slocock' and the apricot tinted 'Mrs .W. C. Slocock,' A few reds and pinks of mixed parentage were also raised and sent out, notably 'Red Riding Hood'—a hardy scarlet: 'Black Beauty'—a dark maroon red: and 'Thunderstorm'—a dark red with white stamens.

Soon however indiscriminate crossing of the older hybrids with anything new that came along passed and raisers set to work scientifically to produce Rhododendrons suitable for their particular conditions and at the same time keeping accurate records.

With the material on which to work widened to some 700 species—to say nothing of the thousands of hybrids—it is a small wonder that the crosses made and the seedlings raised are uncountable.

Plants from the mammoth *sinogrande* down to the creeping *repens* have all been crossed and a range of plants of all colours, shapes and sizes produced and yet we are only on the threshhold of producing the ideal garden Rhododendron; large flowered—free flowering—easy to grow—ideal in shape—and with moderate growth, completely hardy and in all colours.

To start to discuss all the crosses made and even shown would take a volume and it seems that we can only select some of the most successfully used species and trace their influence on the garden hybrids of to-day and perhaps tomorrow.

*Arboreum*

This tall growing woodland tree has several forms and has been in this country from among the first species introduced. It was most successfully used in its dark red form by the Cornish raisers and the seedlings have already been described by MR. ROSE. Two good garden hybrids that must be mentioned are:

'Cornubia' (× 'Shilsonii') and
'Red Admiral' (× *Thomsonii*).

Both are early flowering scarlets with large flowers and, though hardy enough in favoured gardens in the South of England, cannot be termed 'hardy garden plants' as we understand them inland.

The characteristics that *arboreum* carries with it are its tree like growth, the leader continuing to grow and not set flower until it has reached a great height, flower buds being normally carried on the side shoots. The seedlings are shy flowering but the constitution of the plants is strong.

*Campylocarpum*

There are several forms of this magnificent yellow Rhododendron, two of which have been greatly used and the seedlings from

the two forms differ so that we will find in nearly all the first crosses with *campylocarpum* two distinct plants—the first, HOOKER'S variety, is a close growing and rather deeper yellow flower and when crossed with a white species gives all creams and yellows: whereas variety *elatum*, which has a large flower with a more distinct red blotch at the base gives mainly yellows with 25 per cent pinks. The plants are erect and less dense in growth than those bred from the HOOKER'S variety.

This different result from two forms of one species has made some difficulties in the Rhododendron Stud Book. However, it is important that these crosses should be known under different names and not varieties of the one name, as their peculiarities are handed on to the second and third generations.

I will not discuss some of the more noted crosses like 'Penjerrick', which are too tender for all but the most favoured gardens.

The cross with *Fortunei* named 'Gladys,' which is referred to by MR. ROSE has been made by others with very different results. SLOCOCK'S used a form of *elatum* to obtain their race of hybrids they have called 'Letty Edwards.' These have, besides the pure yellow, a pinkish blush to their flowers and some inherit the bright red throat. There are many forms of this Rhododendron in cultivation and someday the best of them will have to be named as sub-varieties. In the meantime, they are grown under numbers and have received Awards of Merit and a First Class Certificate.

Similar results were obtained by crossing with *discolor*, but the *campylocarpum* (HOOKER'S variety) seedlings have been named 'A. Gilbert' and the *elatum* seedlings 'Lady Bessborough,' the pink variety of which is called 'Robert.' These plants which are similar to 'Letty Edwards' or 'Gladys'—flower later and the First Class Certificate form of 'Lady Bessborough' has great lasting qualities. Among the creams and pale yellows I would say these plants are some of the best garden hybrids we have to-day.

The next generation of these hybrids is even more remarkable. 'Lady Bessborough' and 'Letty Edwards' have shown themselves to be excellent parents of garden hybrids and the next generations may give us some of the best yellows, soft salmons and straw coloured shades that we shall ever have.

'Lady Bessborough' crossed with *Griersonianum*—'Day Dream,' is a soft creamy pink shaded with a distinct brick red throat.

'Lady Bessborough' crossed with *Wardii*—'Hawk,' is one of the yellowest hardy hybrids and every one of these seedlings is a first class garden plant.

'Lady Bessborough' crossed with 'Dido' (another plant which is proving an excellent parent) has given a fine range of seedlings of pale orange and pink shades named 'Jalisco,' There are many forms of this cross and at least two have been shown and obtained awards. Particularly fine forms are growing in the Crown Gardens at Windsor. The next crosses of this plant should produce some even finer results and especially would it be interesting to see if some of the best whites of the old ANTHONY WATERER hybrids could improve the habit and trusses and at the same time introduce the orange and yellow "eye" to deepen the orange effect of the flowers.

To get back to *campylocarpum* itself and its influence upon its hybrids, I would sum them up as being free flowering and hardy enough for most British gardens, attractive colours when crossed with pinks and whites and orange shades, and a reasonably strong constitution—that is to say they will thrive without having to be given the best place in the garden.

### *Dichroanthum*

A low growing shrub with orange flowers, has done much to close the colour gap between the pale yellow of *campylocarpum* and the brick red of *Griersonianum*.

A number of first crosses of this Rhododendron are famous, particularly the obvious cross with *Griersonianum*—'Fabia,' which is one of the best front-row garden plants in existence. Nearly all the seedlings of this cross have attractive orange flowers shaded with pink and red and sometimes possessing the double calyx which is characteristic of *dichroanthum* seedlings.

In one cross, in addition to orange some very fine scarlets—rather similar to 'May Day'—were produced, which only goes to show how the constitution of different parents of the same species must alter.

'Dido' ($\times$ *decorum*) has already been mentioned and is more remarkable as a parent than as a plant itself. We have already mentioned the crosses of this Rhododendron with 'Lady Bessborough' and crossed with an unnamed seedling, itself a cross between *discolor* and an ANTHONY WATERER white, has given some very interesting results which might be a pointer to future hybrids. The quarter *discolor* is shown in the growth and the flowers have varied from pale yellows with a double calyx to a large trussed orange and the truss and eye of the old ANTHONY WATERER grandparent. Just one seedling was orange shaded with peach colour and quite the best of its type I have so far seen. I am certain that more work with these seedlings will produce some ideal garden plants.

Crossed with *discolor*, 'Goldsworth Orange' is a low spreading bush with pale orange flowers. It is late flowering and very hardy so is an obvious plant to use as a parent.

Its cross with *Griersonianum*, 'Tortoiseshell,' has given a range of free flowering hybrids in colours from orange red to salmon and even biscuit shades. Variety 'Champagne' is a golden yellow.

As may be seen, *dichroanthum* is still only in its earliest stages of development as a parent and by the time that as much work has been done with it as ANTHONY WATERER did with *catawbiense*, it may be that we shall have some Rhododendrons hardly yet dreamed of. Its characteristics of dwarf growth, hardiness, loose trusses and orange colouring, are traced in all its crosses: but in nearly every case the second and third crosses are proving the best.

### *Didymum*

Must be mentioned as it is one of the darkest red Rhododendrons and has produced some very dark hybrids, the best known of which is 'Arthur Osborn' ( × *Griersonianum*), a Kew hybrid which is a fine dark scarlet though somewhat fastidious as to position. However, other dark hybrids are 'Impy,' 'Red Cap' and 'Rubina,' but here again the best are still to come. All the above, except 'Arthur Osborn,' are rather shy of setting bud.

### *Discolor*

*Discolor* is one of the latest and strongest growing of the Fortunei series and has been crossed a great deal. Some of its first crosses have already been mentioned. Crossed with *Griersonianum*, 'Azor,' is, as one would expect, a salmon coloured Rhododendron with a distinct orange tinge in the throat, and all the seedlings of this parentage form a valuable late flowering addition to any Rhododendron garden.

Many crosses of *discolor* with 'Loderi,' 'Luscombei' and others will have already been discussed by MR. ROSE.

*Discolor's* chief assets in hybridization are its strong constitution and vigour and the size and lateness of the flowers and, as has been said, a small trace of *discolor* in the blood of a seedling will greatly increase its growing powers and constitution.

### *Fortunei*

*Fortunei* and its mate *Griffithianum*, were among the first Rhododendrons whose size of flower was successfully exploited. *Fortunei* itself is a sweet scented tall growing plant very free flowering and with pale dusky mauve tints which give some soft pastel shades in its hybrids.

The 'Loderi' cross is too well known to need description. A first class garden plant, it is more suitable for a woodland than to the more open garden and the huge trusses of white or blush pink can hardly be surpassed when seen at their best.

It should be mentioned that 'Loderi' will grow better in most gardens as a grafted plant on *ponticum* than as a layer. The *ponticum* appears to infuse some hardiness and probably controls the growth so that it does not take the early frosts as badly as it would otherwise do.

Crossed *Thomsonii*, 'Luscombei,' in its best form, is a fine vigorous plant with large pink flowers. As with 'Loderi,' the Leonardslee form is the best.

Crossed *Wightii*, 'China' is an unusual plant with tall trusses of cream coloured flowers with red throats.

'Goldfort' ( × 'Goldsworth Yellow') is a unique plant with the peach coloured back to the flower of 'Goldsworth Yellow' and clear yellow inside with a greenish tinge.

There are so many crosses with *Fortunei* that it would take a chapter by itself to discuss them. However, we cannot leave it without mentioning the cross with 'Aurora' (itself a quarter *Fortunei*) named 'Naomi,' the type plant and varieties of which are some of the most attractive woodland Rhododendrons imaginable, especially the 'Exbury variety' which possesses all the colours of 'Mother of Pearl' combined with a yellow background.

Most of the *Fortunei* hybrids are hardy enough to be grown anywhere but they all prefer some shade to be at their best.

### *Griffithianum*

A tender, tall, loose-growing Rhododendron, this plant is almost a greenhouse plant. Its most famous hybrids have already been mentioned.

Crossed *caucasicum*, 'Dr. Stocker' is well known and widely distributed and with its large ivory flowers is worth growing in any garden. The hardiness of *caucasicum* has sufficiently toned the *Griffithianum* tenderness to make it reasonably hardy in inland gardens.

With 'Doncaster,' 'The Don' cross is famous though somewhat tender. They are strawberry coloured pinks which are prettier when faded than when first opened.

It is, however, the second and third generations that are more widely grown as garden plants.

The crosses with 'Loderi' are of course legion and have already been discussed by MR. ROSE, and such plants as 'Dawn's Delight,' 'Loder's White,' 'Beauty of Littleworth,' 'Pink Pearl' and many others, all owe their size of flower to *Griffithianum*,

though all carry the slight trait of tenderness which unfortunately goes with it.

'Lodauric' ('Loderi' × *auriculatum*) makes a fine late Rhododendron and variety 'Iceberg' has a huge truss and the white is shaded with green in the centre of the flower.

## *Griersonianum*

This geranium red Rhododendron was a great gift to hybridists. It has a fine flower and truss and its seedlings flower early and well, but in other ways it is not so desirable a parent. It is tender and a bad grower and to get good garden plants it is best used with close growing reds or orange shades. Crossed with pinks, one often gets some vile magenta shades. It is safe to say that this plant has been crossed more than any other species, *campylocarpum* included. LORD ABERCONWAY has used *Griersonianum* extensively and the many fine reds that have been given awards show the measure of his success.

'Fabia' is, I consider, one of the best and coupled with 'May Day' (× *haematodes*), make ideal woodland plants when planted on the outside of a ride.

WATERERS (Bagshot) used *Griersonianum* with the old varieties 'G. A. Sims' and 'Essex Scarlet' to produce such hybrids as 'Bonfire,' 'Cavalcade' and 'Vulcan,' all reds and hardier than most *Griersonianum* hybrids.

MR. ROSE has given greater tribute to *Griersonianum* hybrids than I can give. It is, however, again from later generations of these crosses that it is hoped some ideal garden plants will emerge.

One pointer is a seedling recently flowered at Woking—'Tally Ho' × 'Romany Chai'—'Royal Mail.' One plant of this cross is outstanding in being definitely hardier and better in every respect than its parents: in fact, in the opinion of many who have seen it "one of the best scarlets ever."

The late MR. LIONEL DE ROTHSCHILD always had a truss of *Griersonianum* available in his greenhouse for pollinating and together with the use of *eriogynum* and *Elliottii* he raised some very fine scarlets.

Hybrids of the three plants are very similar. *Elliottii* and *eriogynum* however, do not give such free flowering crosses and are even more tender than *Griersonianum*.

## *Lacteum*

*Lacteum* must be mentioned if only to record its disappointment. Some of the forms of this Rhododendron would win a prize against all comers with its rich yellow flowers and fine foliage.

Its seedlings, however, lack everything: they are weak, tender and no better yellows than many other hybrids and a lot of them are dirty pinks. One cross with *discolor* seems to be growing well but so far won't set bud and, after seeing others, we are quite prepared for miserable pink flowers when it does condescend to do so.

### *Thomsonii*

This tall growing blood red Rhododendron is fortunately hardy in most parts of these Islands and has been available to hybridists for many years. Its characteristics, which are carried to its progeny, are its rounded leaves, upright growth and smooth bark, and its bell-like flowers with dark drops of nectar in its base for the visiting bees.

Some of the long list of excellent garden plants are: 'Red Admiral' already mentioned: cross with *barbatum*—'Shilsonii', which is a fine early scarlet, but its earliness rather than tenderness makes its success in many gardens rather doubtful: the cross with the 'Glory of Penjerrick'—'Barclayi,' is one of the finest scarlets anywhere but is too tender for any but the most favoured gardens.

### *Wardii*

*Wardii* together with *campylocarpum*, are the two best yellows available for crossing. It is a shapely bush, fairly hardy, and hybrids that hold the blood of both these Rhododendrons are among the the best yellows. 'Hawk' is one of these and has been already mentioned, while the cross with 'Naomi'—'Idealist,' is a fine hardy Rhododendron and, as one would expect, very similar to 'Letty Edwards.'

As a short study of the Rhododendron Stud Book reveals, there are so many species that have already been crossed that to discuss them all would be impossible.

MR. ROSE has spoken of the dwarfs, the hybridizing of which will in itself be a lifetime study, and I therefore do not propose to do more than mention them. There is, however, one species to which I would like to draw attention, which although not in itself a dwarf has been crossed with them to make some very attractive garden hybrids.

*Spinuliferum* is in itself a species of more interest than beauty: it has brick red flowers and long protuberant stamens but is very tender and somewhat straggly and difficult to grow. However, 'Spinulosum' ($\times$ *racemosum*) is an excellent garden plant and the best form which I have seen is at Exbury and might

be described as a brick red *racemosum* with the protuberant stamens of *spinuliferum* and is, as one might imagine, a very unusual and attractive plant.

The other cross with *lutescens*—'Crossbill,' is a reasonably hardy garden Hybrid of great merit. The flowers are yellow suffused with red and still retaining the *spinuliferum* stamens. It succeeds most years in a cold corner at Woking, which is the home of Jack Frost himself!

I cannot speak from my own personal experience, as I have never had access to a good form of *spinuliferum*, but I should imagine that further hybridization may breed something even better.

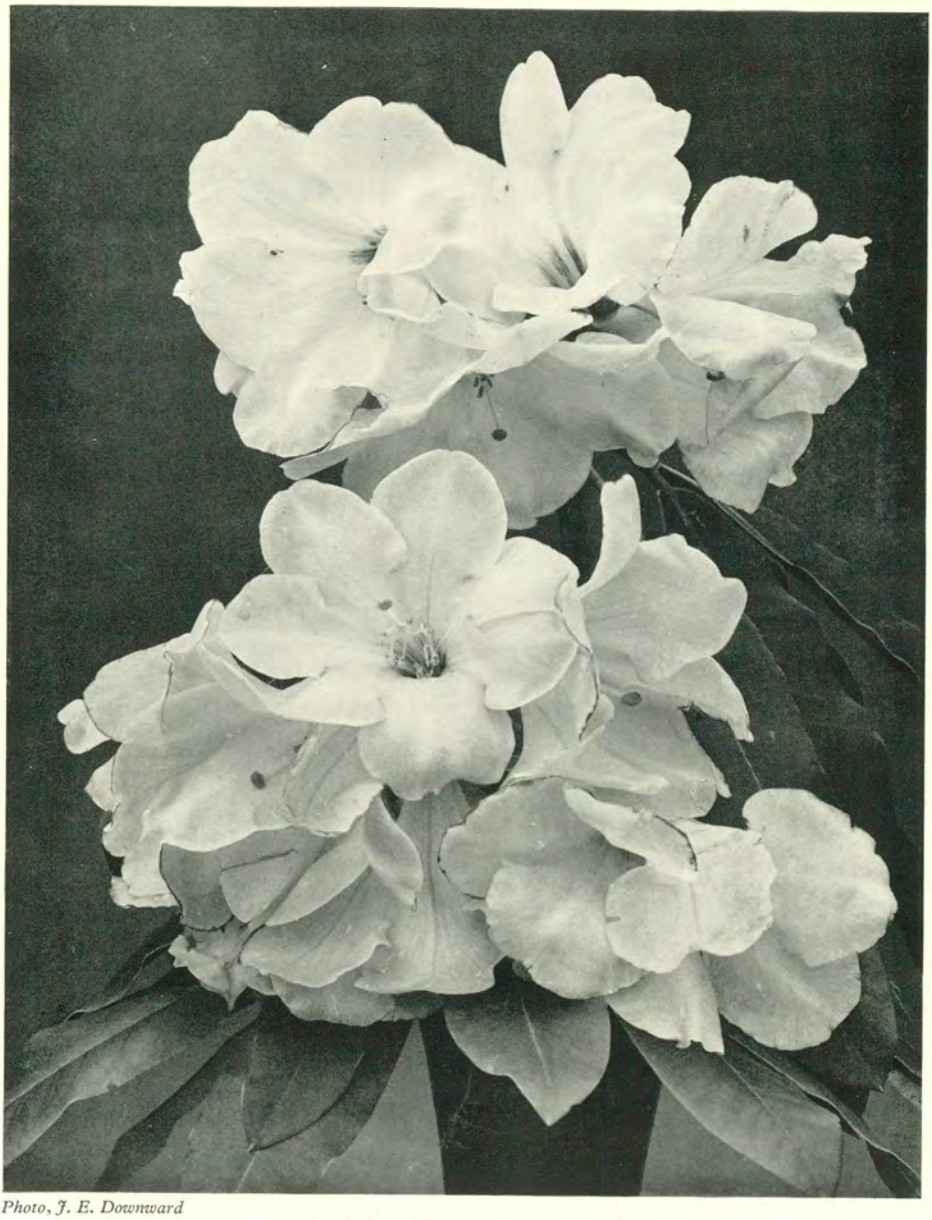
One can hardly watch the results of crosses year by year without reaching some definite conclusions and mine are just these. Some plants, from experience, are found to possess and pass on certain definite characteristics. A good hybrid has to be planned and worked for and the ingredients mixed like making a pudding. If one is crossing for the sake of producing a race of attractive plants, all of which will be of garden use, then one will find that two species, one of which is known to be a good seed parent is the best choice, the next being such a species and a hybrid. Such examples as 'Tally Ho,' 'Loderi', 'Azor', 'Letty Edwards,' 'Lady Bessborough,' 'Fabia' and many others are enough to show the value of first crosses. However, if one is prepared to throw away 99 per cent of one's crosses and still persist toward that rare goal—a first class hardy hybrid—lovely to look at, easy to grow, free flowering, fine foliage and habit—then it is the carefully crossed mongrels that may breed the world beater.

The Knaphill strain of Azaleas are an example in point. The crossing was started by ANTHONY WATERER and later by MR. LIONEL DE ROTHSCHILD and at Goldsworth. These plants have been improved by every generation and yet a greater collection of mongrels can hardly be imagined. Just as in Rhododendrons, some of these Azaleas are found to be outstanding seed parents, although they themselves are of no particular merit.

I feel that we have only reached the threshold of producing really good hardy Rhododendrons, yet however plants may change, there will always remain those outstanding ones of each generation right back to the 'Purple Splendour' and 'Mrs. Anthony Waterer' from the earliest hybridizer.

## DISCUSSION

*The Chairman*, in introducing MR. SLOCOCK, emphasized the high esteem in which Slocock's nursery was held in the Rhodo-



*Photo, J. E. Downward*

RHODODENDRON AWARDS

FIG. 23—*R.* 'Coronation Day' **A.M.** May 24, 1949, exhibited by C. E. Colbourne, Esq. (See p. 187)

FIG. 24—*R.* 'Fittra' A.M. April 26, 1949, exhibited by Messrs. Hillier & Sons (See p. 187)

*Photos, J. E. Downward*

RHODODENDRON AWARDS

FIG. 25—*R.* 'Jack the Ripper' A.M. May 24, 1949, exhibited by Lord Aberconway, C.B.E., LL.D., V.M.H. (See p. 188)

dendron community and also the many good Rhododendrons that MR. SLOCOCK was himself responsible for producing. LORD DIGBY also pointed out that the discovery in the last thirty years of so many new species had made the task of the nurseryman so much more difficult, in forecasting what Hardy Hybrids would be needed by the general public in four or five years' time. The great advance that had been made in hardy Rhododendron hybrids was amazing and no one was more fitted to speak on this subject than MR. SLOCOCK.

*After the Lecture, the Chairman* said he was sure everyone was delighted with this talk. There was one point he would like to clear up and that was the reference made to the *strigillosum* cross which MR. SLOCOCK attributed to him. It was, he believed, a *strigillosum* hybrid raised at Bodnant by MR. F. C. PUDDLE. It is true that he, LORD DIGBY, raised a *strigillosum* cross with FARRER'S best form of *R. facetum* which he called 'Lady Digby,' and which received an Award of Merit. It is particularly interesting as there are two distinct forms raised from the same batch of seed, one with pink buds and the other with green buds. The young growth of each type is quite different and has most attractive colouring. The reason for such a difference seemed hard to explain.

In conclusion the Chairman thanked MR. SLOCOCK very much indeed for his most interesting statement and lecture on hardy hybrids, and called for a very hearty vote of thanks which was accorded with acclamation. He also stated it was sad that this was the conclusion of the conference but he hoped that those present had gained as much benefit from it as he had himself.

# THE RHODODENDRON TOUR

By N. K. GOULD

THE first announcement that the Royal Horticultural Society was organizing a tour of gardens in connection with the Conference appeared in the 1948 *Year Book*, published in December of that year, and it aroused considerable interest among the Rhododendron fraternity. Opinions as to its chances of success were divided. Some thought that by May almost all the best plants would have passed their flowering season in the Cornish gardens, others that in any case the weather would probably be wet or cold most of the time; but the more sanguine stoutly refuted all such suggestions, and their optimism was fully justified by subsequent events.

No difficulty was experienced in filling the three coaches provided, and many more members of the Group would have made the tour if adequate accommodation could have been found for them. After a strenuous week, including the two-day Conference and Show at Westminster and visits to Tower Court, Leonardslee, Wakehurst Place and Wisley, a party over seventy strong left London at an early hour on the morning of Sunday, May 1. We were happy to have among us several of our American friends whose names are well known in horticultural and botanical circles, namely, DR. CLEMENT BOWERS of Maine, New York, MR. and MRS. J. H. CLARKE of Washington, MR. HAROLD EPSTEIN of New York, President of the American Rock Garden Society, and MRS. EPSTEIN, MR. GEORGE GRACE of Oregon, MR. JOHN HENNY of Oregon, President of the American Rhododendron Society, and MR. G. NEARING of New Jersey. We were joined in Cornwall by DR. J. MACQUEEN COWAN of Edinburgh, who had gone on ahead to spy out the land and to ensure that we should not miss seeing anything of importance. DR. COWAN'S ability and willingness to identify and discuss anything associated with the genus Rhododendron contributed enormously to the interest and value of the tour. The domestic arrangements were in the capable hands of MESSRS. COOK'S three couriers, DR. ST. LUKE, MR. BAKER and MR. HOLMEWOOD, who proved their competence to deal with all our non-horticultural problems.

## EXBURY

We had only one engagement for the first day—a visit to Exbury, near Southampton, to see the garden made by the late MR. LIONEL DE ROTHSCHILD; and this was a most appropriate beginning, for MR. DE ROTHSCHILD was the founder of the Rhodo-

dendron Association and a great gardener whose knowledge of, and enthusiasm for Rhododendrons was unsurpassed. We arrived shortly after one o'clock and were received by MR. and MRS. EDMUND DE ROTHSCHILD and MRS. LIONEL DE ROTHSCHILD. We set out at once to explore the Home Wood, passing beneath the group of great cedars to the West of Exbury House. All down the main walk into the wood the varieties of 'Loderi' were in superb condition, and the Kurume Azaleas grouped along the borders of the walk were massed with blossom, 'Hinomayo' and 'Apple Blossom' being particularly fine. The 'Augustinii Walk' was a sight not to be forgotten, some of the best forms of *R. Augustinii*, selected and crossed by MR. DE ROTHSCHILD, being of very clear colour, often with a green blotch enhancing the beauty of the individual flower. Beneath the pines are some grand specimens of *R. calophytum*, which no doubt appreciate the shelter so afforded against Spring frosts. Looking along a small side path we saw a close group of very large bushes of *Camellia reticulata*, a few flowers still remaining to suggest the beauty of this species when in full flower, and a few yards away stood a tall plant of *C. japonica* var. *magnoliaeflora* of a rather pale form, carrying innumerable shapely blooms.

Entering the Winter Garden we came to a drift of the Azalea 'Eddy' (*Kaempferi* × 'Apollo'), a dwarf plant with glowing brick-red flowers needing some shade to prevent bleaching by the sun. Nearby was one of the most outstanding of all the hybrids, namely, 'Fortune,' a wonderful plant raised in this garden from *Falconeri* × *sinogrande*. The plants were about 10 feet high, bearing several great compact yellow trusses. Another attractive plant here, of quite different character, was 'Queen of Hearts' ('Moser's Maroon × *Meddianum*), dwarf and of intensely rich colouring. Returning towards the main walk, through masses of multi-coloured deciduous Azaleas, 'Idealist' displayed its flattish creamy flowers on plants of good habit; and 'Constance' with pale and elegant flowers suggestive of 'Penjerrick' was equally conspicuous. (Fig. 30.) There were three hybrids which evidently have considerable value for massing along the edges of broad walks. 'Cowslip' (*Williamsianum* × *Wardii*), raised at Bodnant, formed hummocks 2 or 3 feet high, completely covered with flowers in cream and pale pink tints; 'Mandalay,' an Exbury plant from *haematodes* × *venator*, not over 2 feet in height, had trusses of bright vermilion; and 'Carmen' (*repens* × *didymum*), also raised here, glowed blood-red in the sunshine.

MR. and MRS. EDMUND DE ROTHSCHILD very kindly entertained us to luncheon, after which we proceeded to Witchers

Wood, where we were introduced to many more treasures. The fine forms of *R. chasmanthum*, laden with bloom, were a sheer delight, and a pink form of *R. Davidsonianum* was equally lovely. The varieties of 'Lady Chamberlain' and 'Lady Rosebery' could hardly have borne more flowers, and were very much admired. In addition to Rhododendrons, Witchers Wood is planted with many flowering and foliage trees and shrubs, which could supply plenty of material for a separate article. To mention but one, *Cornus Nuttallii*, in a perfectly-shaped tree almost 20 feet and covered with flowers, was superb. But to return to the Rhododendrons, here were 'Electra,' a most successful cross between *Augustinii* and *chasmanthum*, giving a better blue than either parent, and 'Mariloo,' an interesting Exbury hybrid from *lacteum* × 'Dr. Stocker,' with a compact truss of pure yellow flowers, and named by MR. DE ROTHSCHILD in honour of MRS. DE ROTHSCHILD.

One of the most noteworthy hybrids raised at Exbury must surely be 'Lady Bessborough' (*discolor* × *campylocarpum* var. *elatum*), a plant of good habit, bold, clean foliage and full trusses of cream flowers with red blotch at the base, varying towards pink in some forms. MR. DE ROTHSCHILD certainly thought highly of this, for he used it in many later crosses, producing a series of first-class hybrids from it. Some are already well known, and appear regularly in the hybrid classes at the Rhododendron Shows. To this group belong 'Hawk' ('Lady Bessborough' × *Wardii*), 'Day Dream' ('Lady Bessborough' × *Griersonianum*), 'Halcyone' ('Lady Bessborough' × *Souliei*), 'Hermes' (*apodectum* × 'Lady Bessborough') and 'Jasper' ('Lady Bessborough' × *dichroanthum*).

Leaving for a time the narrower woodland paths we crossed the stone bridge spanning a public highway, noting a charming planting of 'Bow Bells,' whose compact growth and dainty rose-coloured corollas opening from carmine buds betrayed its *R. Williamsianum* parentage; also an attractive grouping of the rosy-lavender *R. caeruleum* and its white variety. As we approached a moist glade where formerly Primulas were grown there came into view a drift of *R. Vaseyi* with innumerable blossoms poised like pink butterflies ; and shortly afterwards we arrived at the Rock Garden.

This was constructed in a long, shallow gravel pit, with bold rock-masses and an elaborate irrigation system. The lower parts are closely planted with small-flowered species of the Series Lapponicum, Boothii, Glaucum, etc., and the plants have grown into a billowing mass, which at the time of our visit was covered with flowers, the lavender and mauve hues predominating.

High up, around the margins of the pit, there are masses of *R. yunnanense* and other Triflorums, and a patch of vivid colour is provided by the carmine Azalea 'Sir Wm. Lawrence' ('Hinodegiri' × *obtusum* var. *Kaempferi*).

We were a little too early to see the Exbury Azaleas at their best, although at several points on our walk we had paused to examine and admire groups of plants coming into flower which were plainly superior to those seen in the majority of gardens; and later, returning to Exbury House along the main drive we were able to see many more in a wide range of colour, but all of bright and definite hue, effectively planted in association with forms of *Acer palmatum*. These were created by MR. DE ROTHSCHILD largely by judicious crosses within the several colour-groups of the best plants available. He used some of those raised by the late MR. ANTHONY WATERER of Knaphill, who had improved upon the original *molle-japonicum* hybrids by introducing blood of the N. American species *R. calendulaceum* and *R. occidentale*. Many of the finest Exbury hybrids have been named, and several have received the Award of Merit.

The afternoon was far advanced by the time we arrived back at our starting-point. It had been a most delightful and memorable day, and it was not until we were once more in the coaches and had re-commenced our journey that we realized what a lot of ground we had covered on a warm and sunny afternoon.

MINTERNE

After a night at Boscombe we went on through Dorchester to Minterne, Cerne Abbas, the property of LORD DIGBY, where only two families, CHURCHILL and DIGBY, have lived since the middle of the sixteenth century. LORD and LADY DIGBY kindly provided welcome mid-morning refreshment, and conducted the party through the panelled rooms and corridors to see the famous tapestries, some of which were presented by the City of Brussels about 1710 to GENERAL CHARLES CHURCHILL, the brother of the great DUKE OF MARLBOROUGH. The almost perfect state of preservation of fabric and colour in these superb works is remarkable.

ADMIRAL DIGBY carried out extensive planting at Minterne in the eighteenth century, and his plantations eventually provided a suitable home for the collection of trees and shrubs which has been established during the past sixty years. From the terrace a path follows the gentle slopes of the valley beneath great yews, cedars and redwoods, and at every turn one finds fine examples of Rhododendrons from the collections of HOOKER and later travellers, as well as many excellent hybrids raised by LORD DIGBY.

The largest plant of *R. Falconeri*, planted in 1893, carried nearly twelve hundred trusses of flowers in 1948, but has rested this year. This and other large-leafed species, including *R. sinogrande*, all appeared to be in very healthy condition, very different from those in certain gardens nearer home where they struggle against adverse conditions of soil and climate. Some other particularly noteworthy species were *R. strigillosum*, of which a large bush was opening its young foliage encased in long red bud-scales, a very richly-coloured *R. Albrechtii*, WILSON'S *R. Wasonii* var. *rhododactylum*, distinguished by its densely-spotted rose bells, and FARRER'S large *R. desquamatum*. The double mauve variety of *R. mucronatum* called 'Fuji-manyo' is not often seen, but flowering freely here, in a moist spot among the greenery of ferns, it was most attractive. As examples of the very wide range of hybrids one may mention 'Gilian,' a hybrid of *R. Griffithianum* raised by the late MR. MAGOR, 'Blue Tit,' 'Lady Alice Fitzwilliam,' 'Sheila Moore' (*Elliottii* × *decorum*), and an un-named plant from *campylocarpum* × *sperabile*, making a small, neat bush with lustrous cherry-red blooms. 'Cornish Cross,' too, was good, but unfortunately we were too late to see the full effect of 'Lady Digby' (*strigillosum* × *facetum*).

Along the margin of a delightful waterway we saw enormous specimens of *Acer palmatum*, some fifty years old, *Cercidiphyllum japonicum*, Japanese Cherries and a tall, slender tree of *Cedrela sinensis* in ruby-coloured young leaf, underplanted with a variety of herbaceous plants including a broad stretch of *Trachystemon orientale*, whose massive, Funkia-like leaves make excellent ground-cover, even under trees.

We returned by way of the Japanese Cherry Avenue, along a path overhung by blossom and bordered with bluebells and a host of other wild flowers, to the range of glass, where, in complete contrast, we saw vines, figs, carnations, orchids and roses, including a gigantic trained specimen of 'Climbing Ophelia' from which many hundreds of early blooms had been cut. It was with reluctance that we left this delightful place, but a long drive by way of Dorchester, Axminster, and Exeter to Torquay lay before us. The long distances we were obliged to cover between stops were relieved of monotony by the ever-changing views and by the beauty of the wild vegetation. Those members of the party with an eye for the native flora were tantalized by fleeting glimpses of hedgerow treasures, for as we went further west the banks were massed with primroses, ferns in great variety, pink campion, and here and there a vivid colony of purple orchis.

The next morning, Tuesday, May 3, a few early risers paid a

brief visit to the Tor Abbey Gardens, which are full of interesting plants. In a large show house there, among a mixed lot of succulents and flowering and foliage plants of every description, a specimen of *Encephalartos villosus* was found bearing five ripe pineapple-like cones shedding large red seeds.

### CAERHAYS CASTLE

Owing to a late start, a wait for the ferry at Plymouth, an unexpected but very pleasant halt to see the garden at Boconnoc by the kind invitation of MRS. G. FORTESCUE, and a somewhat protracted luncheon interval at the Carlyon Bay Hotel, the afternoon was far advanced before we reached Caerhays Castle. MR. CHARLES WILLIAMS, M.P., and his Head Gardener MR. MICHAEL conducted us around this magnificent garden, and to those members of the party who had not previously visited any of the famous Cornish gardens the size of many of the trees and shrubs, and their luxuriant growth, came as a revelation. We saw first the huge bushes of the Kurume Azaleas and other forms of *Rhododendron obtusum* planted by the late MR. J. C. WILLIAMS along the drive, where the banks were carpeted with wild alliums, anchusa and bluebells. *R. mucronatum* formed snowy drifts here, and large specimens of the hybrid Camellias of the 'J. C. Williams' class were still flowering freely. 'Cornish Snow' (*saluenensis* × *cuspidata*), known previously to most of us only in the cut spray, was seen here 10 feet high, decked with its dainty white blooms. The collection of Magnolias at Caerhays is remarkably complete. We were just in time to see the last flower of *M. Sargentiana*, but the glory of the tall trees of *M. Sprengeri diva*, *M. Dawsoniana* and *M. Campbellii* was left to our imagination. The lovely yellow buds of *M. Fraseri*, rising from bronzed young leaves, were just expanding, and so were those of the many seedlings of *M. sinensis*. A plant of great rarity and interest was *Michelia doltsopa*, a compact evergreen bush probably 25 feet high, covered with white, fragrant, Magnolia-like flowers.

Among the host of lovely Rhododendrons perhaps the most impressive were the immense plants of *R. Griffithianum* and 'Loderi,' the white 'Sir Charles Lemon' reaching nearly 20 feet, great glossy-leafed specimens of *R. sinogrande*, and the broad hummocks of *R. Williamsianum* flowering with a freedom one had not imagined possible. The many fine hybrids made in this garden were well represented, among them the long-flowering 'Yellow Hammer' (*sulfureum* × *flavidum*), 'Robin Redbreast' (*orbiculare* × *Houlstonii*), 'Crossbill' (*spinuliferum* × *lutescens*),

and 'Royal Flush' (*cinnabarinum* × *Maddenii*) varying from pink to pale apricot.

A most enjoyable tea was generously provided for us by MR. and MRS. WILLIAMS, and after one last look at the Castle in its lovely silvan setting with the sun falling behind it, we unwillingly set out for Falmouth.

PENJERRICK

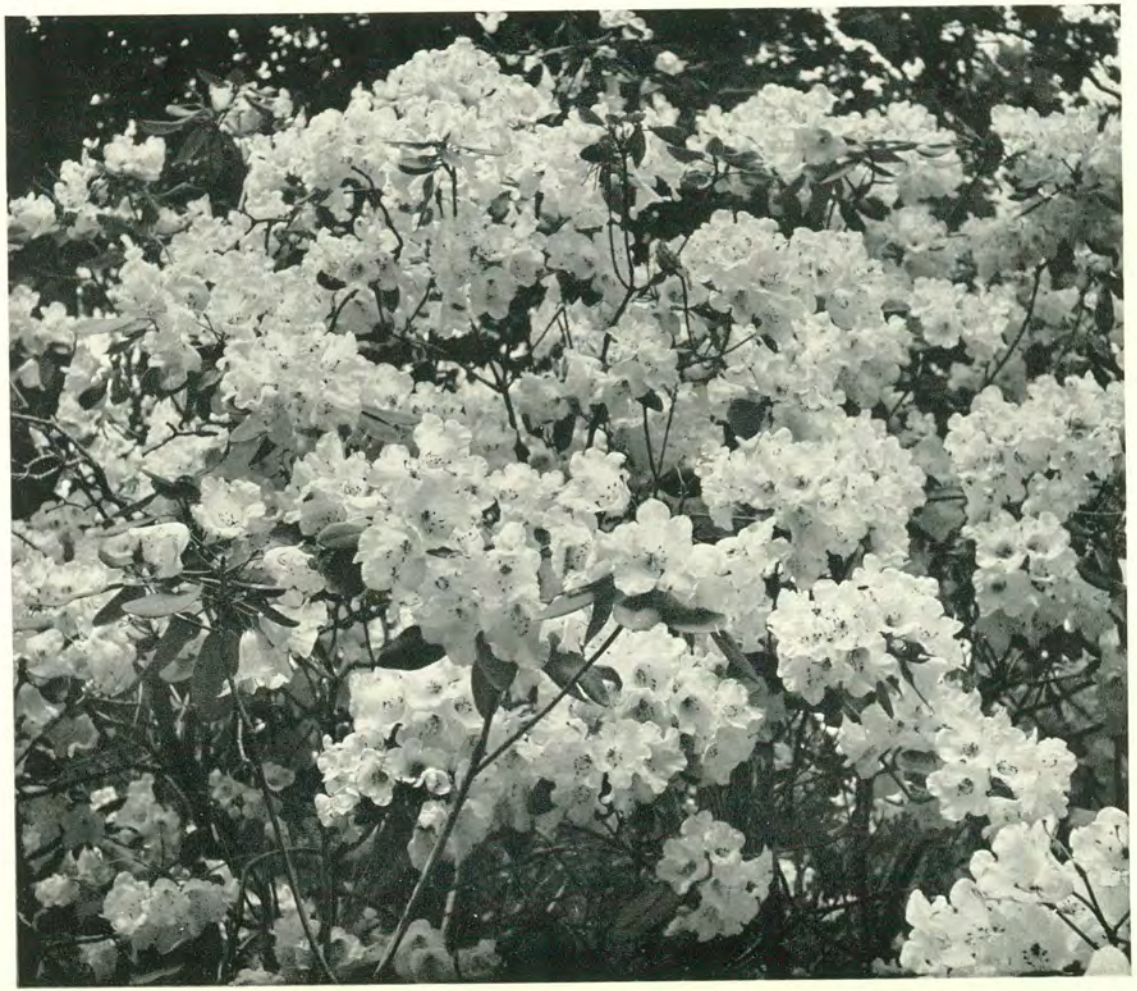
Rain fell heavily that evening, and when we left the following day low clouds threatened an unwelcome break in the weather. Luck was with us, however, and the appearance of the sun was not long delayed. We spent the morning at Penjerrick, the property of MR. W. T. FOX and the birthplace of the noted hybrid 'Penjerrick,' (Fig. 26) raised by a former gardener, SAMUEL SMITH, who was responsible for another first-class hybrid 'Cornish Cross.' MR. FOX'S uncle, the late ROBERT BARCLAY FOX, crossing *R. arboreum* and *R. Griffithianum* half a century ago, made 'Glory of Penjerrick,' mating this with *R. Thomsonii* to produce 'Barclayi.' 'Cornubia' was another of his successes. It was an exciting experience to see such distinguished plants in their real home, but there was much more to attract the eye as we wandered down the valley framed by immense beeches and other noble trees. A vigorous young specimen of *Rhododendron giganteum* has flowered here twice, although we were not favoured with a sight of its crimson blossoms. The fragrant *R. formosum*, its beautiful hybrid 'Tyermanii' and 'Lady Alice Fitzwilliam' were flowering abundantly, and among the species a large-flowered orange *R. concatenans* was most conspicuous. Some of the conifers here are very impressive, especially *Pinus Montezumae* 50 feet high, with long, widely-spreading needles, the graceful *P. patula*, *Dacrydium Franklini* the Tasmanian Huon Pine, with slender weeping branches, and *Picea Smithiana* with a straight, towering trunk. Great size was a notable feature of many other trees and shrubs. *Myrtus Luma*, for example, going up to 40 feet, its trunk clothed in smooth brown bark, *Tricuspidaria lanceolata* at least half that height, *Eucryphia cordifolia* and *Drimys Winteri* forming massive leafy pyramids, and *Feijowa Sellowiana* and *Lomatia ferruginea* of considerable stature.

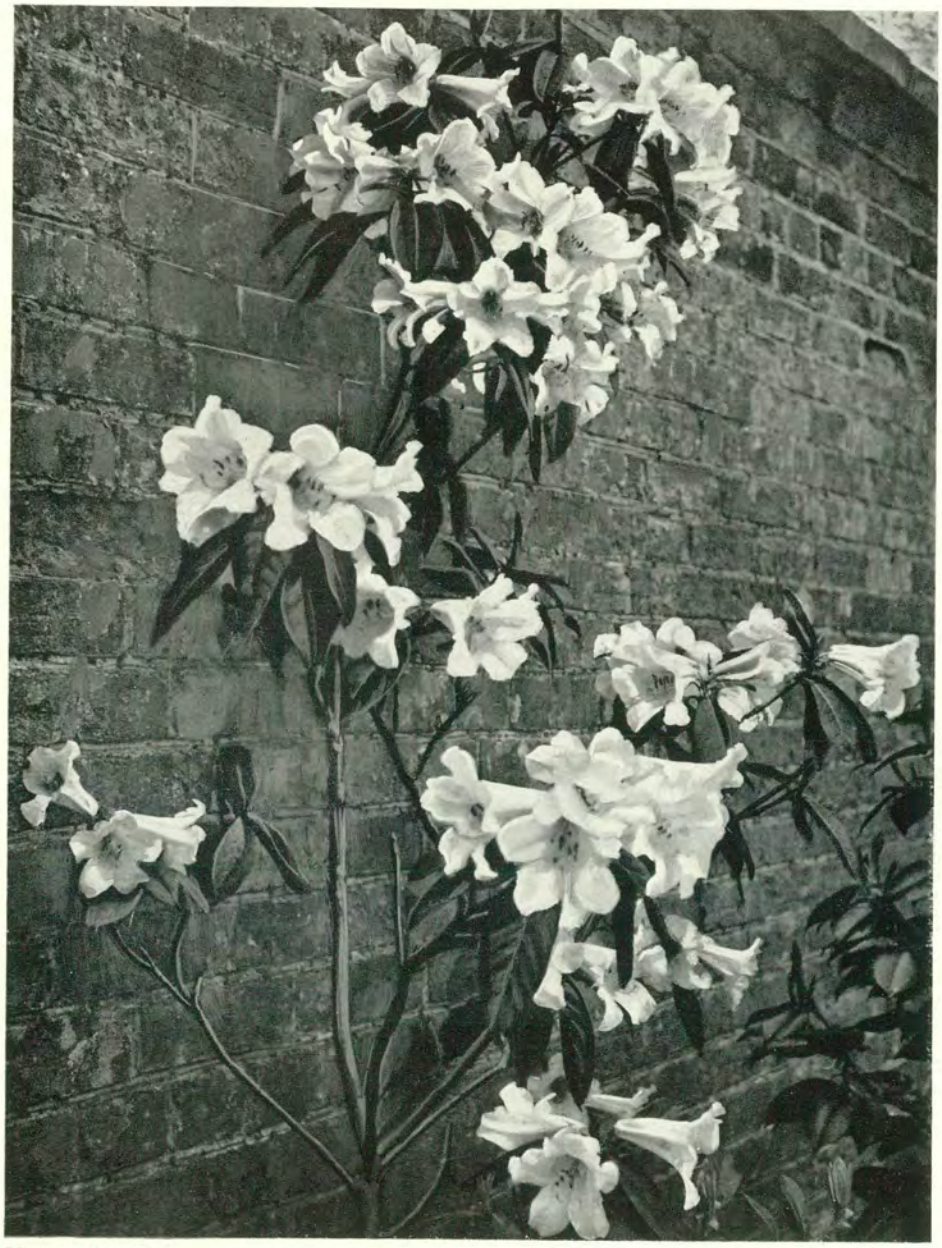
TRENGWAINTON

Luncheon at Penzance was followed by a hasty dash to Land's End, where we were allowed just time enough to scramble down the rocks and admire the turfy ledges covered with campion,

FIG. 26—*R.* 'Penjerrick' at Penjerrick (See p. 120)

*Photo, A. G. L. Hellyer*





*Photo, A. G. L. Hellyer*

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FIG. 27—*R.* 'Laerdal' (*R. Dalhousiae* × *Johnstoneanum*) at Trengwainton (See p. 121)

FIG. 28—*R.* 'Fragrantissimum' at Trewithen (See p. 122)

*Photos, A. G. L. Hellyer*

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FIG. 29—*R.* 'Royal Flush' (*cinnabarinum* × *Maddenii*) at Trewithen (See p. 122)

FIG. 30—*R.* 'Constance' at Exbury (See p. 115)

*Photo, A. G. L. Hellyer*

thrift and scilla. We were soon away again to visit Trengwainton the residence of COL. E. H. W. BOLITHO. In order that we might examine closely the flowers of his best plants COL. BOLITHO had kindly prepared a table exhibit of more than twenty vases of cut sprays. Before our tour of the garden began DR. COWAN gave us a short talk about these, explaining that a great many of the Trengwainton plants had been raised by COL. BOLITHO from seeds collected by CAPT. KINGDON-WARD on the 1926/28 expedition to Burma and Assam. *R. Taggianum* was represented by a lovely truss of solid white, yellow-blotched flowers cut from a fine healthy bush about 6 feet tall, which we saw later; *R. Johnstoneanum* of the same series was there together with its double-flowered form. This was interesting, although it lacked the quality of the type, and beside it on the table was 'Telltale,' a double rose-coloured hybrid produced by crossing it with *R. tephropeplum*. Another remarkable hybrid, created by COL. BOLITHO from a cross between *R. Dalhousiae* and *R. Johnstoneanum*, and named 'Laerdal' shortly before our arrival, had massive, long-tubed, Lily-like flowers of strong fragrance. (Fig. 27.) The Maddenii series was represented by a third species, *R. iteophyllum* which makes a small Azalea-like bush with an abundance of warm creamy flowers.

Some other exhibits were a splendid vermilion-scarlet, heavily-spotted *R. Elliottii*, the uncommon crimson *R. zeylanicum* and 'Gwilt King,' the intensely coloured result of its cross with *R. Griersonianum*, the rose-flushed, dark-leafed variety of *R. bullatum*, and a particularly good red form of *R. Keysii*. The large-leafed series were represented by the last truss from a big tree of *R. Macabeanum*, a huge compact truss from a pale cream-coloured seedling of *R. sinogrande*, and the rose-purple *R. lanigerum*. This was not all, for the group also included the delicately-hued 'Cornish Cream ' raised here from *campylocarpum* × 'Fortorb,' and a trio of pale, elegant beauties—'Countess of Haddington,' 'Sir Charles Lemon' and an exquisite wax-white *R. Griffithianum*.

Our walk round the garden revealed many other plants of interest. Among the Rhododendrons *R. tephropeplum*, *R. neriiflorum*, *R. orbiculare* and *R. Falconeri* were very fine, the most spectacular specimen being a huge bush of the white *R. Griffithianum*, laden with glistening white bells. Magnolias were well represented, as in all these great gardens, *Pieris Forrestii*, in the writer's opinion, the best yet seen, *Eucryphia lucida*, *Camellia reticulata*; and down the long drive a sea of blue hydrangeas, the first few flowers giving promise of a wonderful display.

TREWITHEN

After a second night at our Falmouth base we set out with eager anticipation for Trewithen, for it was already apparent that although a similar selection of the best species and hybrids was to be expected in every one of these Cornish gardens each would almost certainly contain something very special, either some plants of great rarity and interest or certain specimens in superlatively fine condition. We were never disappointed. MR. and MRS. G. H. JOHNSTONE, who met us on our arrival and accompanied us on our walk, have converted an area of woodland into a garden of great charm, containing a most comprehensive collection of trees and shrubs. Along either side of a wide grassy glade leading from the house, rare and choice plants claimed our attention, and beyond and behind these winding paths revealed fresh delights at every turn. Some of the large-leafed Rhododendrons were particularly fine. *R. Macabeanum*, about 18 feet across, bore a flower-truss at the tip of nearly every branchlet, and must have been a wonderful sight a little earlier when at the height of its season. *R. Hodgsoni*, approaching 20 feet and full of flower, was stripping its older bark to expose a smooth trunk, as these large-growing species are apt to do as they age. *R. Falconeri* and *R. eximium*, noted for its massive foliage, *R. argenteum* showing the shining undersides of its leaves, and *R. niveum*, distinct in its silvery-heliotrope flower, were all greatly admired.

Of the hybrids, a few which were especially good were 'Royal Flush' in pink and cream (Fig. 29), 'Frill,' a very pleasing white, 'Jennifer,' a dainty yellow, and 'Alison Johnstone,' raised by MR. JOHNSTONE from *yunnanense* × *concatenans*, forming dense bushes heavily laden with exquisitely-shaped cream flowers warmly flushed with pink.

Only a tithe of the other fascinating plants can be mentioned here. The Magnolias, of which there is an extremely good collection, including such rarities as *M. nitida*, almost made one wish the visit could have been a month or two earlier; but in that event we should have missed seeing a tree of *Prunus campanulata* 30 feet high glowing with carmine flowers, *Rehderodendron macrocarpum*, its arching branches wreathed with white, Styrax-like blossoms, *Enkianthus sinensis* (Forrest 29045) with globular ruby bells, and the towering *Drimys Winteri* and its variety *latifolia*, the latter a very distinct plant with large, laurel-like leaves. *Drimys aromatica* was here, of course, and also the modest *D. colorata* with silver-backed leaves. Among the Maples attempts to identify *Acer reticulatum*, a species with an unusually

narrow, glossy leaf, produced some wild guesses, although the bronze-foliaged *A. Hookeri* and *A. Wardii* presented less difficulty. Lofty bushes of *Schima khasiana*, grown into a hedge, a species of *Reevesia*, a species of *Litsea* with nodding, silver branch-tips, and *Corylopsis sinensis*, out of flower but with young foliage shot with red and pale green, may all be noted as plants one would like to see more frequently.

HELIGAN

The great size of many of the trees we saw has already been referred to, but in the garden at Heligan, St. Austell, visited by the courtesy of LT.-CMDR. H. H. THOMAS, some we saw were such as to evoke feelings of awe, not unmixed with regret that the garden, once well planted with fine material, has suffered unavoidable neglect. Many of the less robust things have, doubtless, perished; but of those that remain the growth is immense, so that here and there, for example, *Rhododendron arboreum* may be seen in real tree form, its unbranched trunks lifting a dense flowery crown of boughs to a height of 60 feet among the majestic Beeches which have sheltered it from infancy. DR. COWAN assured us he had not seen larger trees of this species in its natural habitat, and none so large was recorded by the late MR. F. R. S. BALFOUR in Western Scotland (*vide Rhododendron Year Book*, 1946, pp. 32–34). No exact measurements were made by the present writer at Heligan, but it may be of interest to record the approximate sizes of a few others. A shapely specimen of *R. argenteum* was in the neighbourhood of 35 feet high, *R. Thomsonii* 15 feet, *R. campylocarpum* var. *elatum* 12 feet, *R. Maddenii* a floriferous thicket of slender growths 10 feet, and 'Fragrantissimum,' filling the air with sweetness, 9 feet high and 15 feet across. One of the most striking was a vast tree of *R. Falconeri* in perfect condition; *R. Hodgsonii*, covered with flower, although not brilliant was really very handsome; *R. niveum* and *R. Fortunei* were also unusually good.

A large round-topped tree that appeared in the distance to be an unfamiliar species of Rhododendron proved, at close range, to be *Daphniphyllum glaucescens*, and nearby was a grand old Cork Oak, evidently of great age. A final surprise was in store for us in the form of a plant of *Camellia reticulata*, believed to be the largest in the country, planted against a wall but having long since outgrown the shelter provided for it. It reached upwards to a height of 20 feet or more, with branches extending in all directions. It afforded a good illustration of the long flowering season enjoyed by Camellias and many other shrubs in these

Western gardens, for even at this late date it still carried scores of fresh flowers although an enormous number had fallen.

TREGOTHNAN

We returned to Falmouth for our last night in Cornwall, and left early in the morning of Friday, May 6, prepared for a heavy day, for although we were to visit only one garden a longish afternoon drive lay before us. Our first halt was at Tregothnan, Truro, the property of the Viscount Falmouth, where we found MR. COURTS awaiting us. From this stately mansion, as from the wide lawns and terrace, and the paths leading from them, one received an immediate impression of that spaciousness and balance which proceeds only from masterly design.

Through a walled garden where *Buddleia Colvilei*, *Cestrum elegans*, *Lomatia ferruginea* and Leptospermums were conspicuous among a large number of evergreen shrubs we entered a broad avenue of Beech interplanted at intervals with noble groups of Thujas and Cypresses and affording shelter to a variety of Rhododendrons. We were informed that many of these were nearly a hundred years old, and they were certainly of great size. At a point where our path entered a grassy clearing there stood a truly majestic tree of *Cupressus macrocarpa* of smooth pyramidal outline, measuring fully 80 feet in height and horizontal spread. This garden contains many other extremely handsome specimen trees. The species of *Quercus*, and the varieties of Holly, at one time popular but rarely planted now, were interspersed with palms, bamboos, conifers and huge thickets of *Camellia japonica*. Here and there among the greenery flame-red pillars of *Embothrium* rose to a height of 40 feet or more, and *Eucalyptus Gunnii* formed billowing masses of rather sombre colour contrasting strongly with the young green of the forest trees and the bronzed blades expanding on the deciduous Magnolias.

Where we entered the more densely wooded area of the garden the ground was carpeted with bluebells, and here were some superb Rhododendrons. In one secluded spot the branches of *R. cinnabarinum* were drooping beneath the weight of flower, and the richly-coloured corollas of var. *Roylei*, on a bush 15 feet high, glowed warmly in the morning sunlight. An unusually fine specimen of *R. Keysii*, too, was flowering abundantly. Some other interesting plants were 'Gill's Triumph,' an old hybrid of *R. arboreum* × *R. Griffithianum*, a fine big red *R. arboreum* still in flower, the uncommon, narrow-leafed *R. sperabile* var. *weihsiense*, and 'Countess of Haddington.'

Near the walls of the house and terraces were discovered a good many attractive plants. There was a fine tree of *Chordospartium Stevensoni*, unfortunately not in flower, but easily recognizable by its pendent, whip-like branches. *Teucrium fruticans*, *Senecio Greyi*, and *Abutilon megapotamicum* were all quite at home here, *Clianthus puniceus* showed promise of an abundant display of flower, while *Akebia quinata*, *Lardizabala biternata* with long trails of young bronze foliage, and *Jasminum revolutum* had attained a great height. In a sheltered corner *Rosa bracteata* had been trained to a West wall, and must be lovely in flower, backed by the mellow grey stone.

It was with the greatest reluctance that we turned our backs on the last of the Cornish gardens and sped Northwards in the direction of Tintagel, where luncheon was awaiting us at the King Arthur's Hotel. Near St. Columb Major an incident occurred which might have had embarrassing results. The boot in the rear of the leading coach, opening unexpectedly, began to shed pieces of baggage along the highway, but fortunately these were observed and collected one by one by those following. Climbing towards Camelford in the early afternoon coach No. 2 developed some obscure engine trouble, which necessitated a series of tedious halts, with the result that we did not arrive at Minehead until after nine o'clock.

The next day we lingered a little over breakfast, as we had no morning engagements, and leaving Minehead tarried for a short time in Dunster before getting under way. Going via Bridgwater and Bristol we reached Gloucester as arranged in time for luncheon, and managed to persuade our couriers to give us half-an-hour for a visit to the cathedral. If one may at this point venture a word of criticism of the tour, it is that the time-table was rather too full. We should all have liked a little more time in places of historic interest, and a little more free time in the mornings and evenings to make those small shopping expeditions so vital to smokers and almost equally so to others away from home for a few days.

During the afternoon we spent an hour or two in the garden at Hidcote Manor, the first of the gardens to be taken over by the National Trust. It was in complete contrast to any other garden we had seen, and the perfect examples of hedging and topiary are worth going a long way to see. It is, of course, not primarily a Rhododendron garden, and as it has recently been described by MISS SACKVILLE-WEST in the Society's Journal we shall not detail its attractions here.

The three coaches went on to different destinations for the night; one to Stratford-on-Avon, one to Leamington, and the

third to Broadway. A perfect Sunday morning, after a colder night than gardeners care for in May, saw us on the way to North Wales. Evesham, Worcester, Kidderminster, Shrewsbury for our mid-day meal, Whittington and Chirk, and then down the valley of the River Dee through the Vale of Llangollen where the tree-covered slopes in their Spring dress formed a picture of the utmost beauty, and so finally to Bettws-y-Coed.

BODNANT

The next morning was sunny, with a slight breeze, and we left at an early hour to make the short journey to Bodnant. We were received by LORD and LADY ABERCONWAY, and after a brief pause in which to admire the magnificent view across the terraces towards the Snowdon range we set out on our tour of inspection, led by LORD ABERCONWAY, the HON. CHARLES McLAREN and MR. CHARLES PUDDLE. It had been arranged that the morning should be spent here and the afternoon devoted to a sight-seeing trip to Conway Castle, but the President most kindly suggested that those who wished might spend the whole day at Bodnant. The majority gladly accepted this invitation, for there was plainly far too much to be seen in one morning.

Situated above the River Conway on a South-west slope and covering an area of more than sixty acres, the garden at Bodnant consists of two main portions; an upper part around the house, containing lawns, flower-beds and terraces, and a lower part known as the Dell, through which the River Hiraethlyn, a tributary of the Conway, flows, comprising pinetum and wild garden. The story of the development of these grounds has been told elsewhere, and little will be said here except that they were originally laid out in 1874 and in succeeding years by the late MR. HENRY POCHIN, LORD ABERCONWAY'S grandfather, and that the terraces South-west of the house were designed and constructed by the late LADY ABERCONWAY and her son, our President between 1905 and 1914. When one observes the great size and luxuriant growth of the trees and shrubs it is difficult to believe that so much has been accomplished within this period.

It is no secret that Rhododendrons hold a high place in the President's esteem, but to spend the day in his garden is to realize that in order to plant it he has collected together almost everything of quality and rejected worthless plants lacking decorative value. This wide range of beautiful things has been so disposed as to form a collection of great interest, each item placed where it may develop naturally and show itself to the best advantage.

We strolled first down through the spacious terraces, noting

the fine buttressed stone walls affording shelter to a great variety of somewhat tender shrubs. The lovely white *Wisteria venusta* on the balustrading was especially noticeable as we descended to the Rose Terrace, which is arranged with beds separated by flagged paths, the beds containing tulips and other Spring flowers and edged with a variety of dwarf plants. At the next level is the Croquet Terrace, a velvety sward backed by a high wall with a shrub border at its foot. A large volume would be required were one to attempt to list all the plants here, for, as on the other terraces, the wall-space is well filled; and in all directions one can see fine specimens of notable trees and shrubs, including *Magnolia Campbellii*, *M. Delavayi* and an exceptionally blue form of *Cedrus atlantica glauca*. Next comes the Lily Terrace, containing a large formal pool in which many hybrid Waterlilies are growing. Borders of herbaceous flowers are set out around the sides of this terrace.

We descended again by way of a curved pergola to another section with formal beds, noticing on the way species of *Solanum*, *Tricuspidaria*, *Desfontainia*, *Eucryphia*, *Fabiana* and other choice genera, and last of all to the Canal Terrace with its long, rectangular bathing-pool. The two longer sides of this terrace have borders planted chiefly with blue flowers; it is framed at the North end by smoothly-trimmed yew hedges, and at the other end stands a garden house of unusual design.

At this point we left the terraces and made our way down a glen, where many of the smaller Rhododendrons were growing interplanted with primulas of the Bartley strain, towards the pinetum. (Figs. 32, 33.) One by one a series of noble conifers came into view. The largest of all is a specimen of *Abies grandis* planted in 1876 by JOHN BRIGHT, LORD ABERCONWAY'S great-uncle, and a short distance away stands an extremely fine *Cedrus atlantica glauca* of the same age. Planted a few years later, *Abies Lowiana* has attained a height of 125 feet. *Pseudotsuga taxifolia*, *Tsuga heterophylla*, *Sequoia sempervirens* and *S. gigantea* have also reached an enormous size. All along the Dell stream stand these handsome giants, and among them we discovered many less common species such as *Abies Pinsapo*, *A. bracteata*, *Pinus Bolanderi*, *Taiwania cryptomerioides*, *Juniperus Coxii* and *J. recurva*. Among the many interesting Rhododendrons in the Dell, 'Matador' (*strigillosum* × *Griersonianum*) was conspicuous. Resplendent in crimson-scarlet, with dark and shapely foliage, this and 'Laura Aberconway' (*Griersonianum* × 'Barclayi') which we saw later, are perhaps two of the very best of the larger Bodnant hybrids.

Continuing our walk up the Dell and recrossing the stream

we came back to higher ground where, in the Rhododendron Rock Garden, many of the delightful dwarf hybrids were flowering. In such hybrids as 'Elizabeth,' 'Ethel,' 'Dainty' and 'Charmaine,' the low-growing habit of *R. repens* has been combined with the free-flowering character of *R. Griersonianum*, *R. haematodes* and *R.* 'Shilsonii' to produce a race of brightly-coloured, floriferous plants eminently suitable for small gardens. *R. Williamsianum* is used in a novel manner to form a border around a circular pool occupying the centre of a small garden enclosed by a wall against which plants usually considered tender are growing happily. *R. bullatum*, *R. seinghkuense* and 'Princess Alice,' all of the Edgeworthii Series, are there.

A delightful aspect of Bodnant is that while accommodation has been found for an enormous number of species of certain genera it gives no suggestion of botanic garden arrangement. We came upon a collection of Daphnes planted in beds quartering a charming circular lay-out; Gentians in a series of rock-edged beds backed by drifts of varieties of *Rhododendron obtusum* and fastigiate Junipers; and members of the race of *R. obtusum* developed by MR. B. Y. MORRISON forming a colourful border in which unusual plants such as *Photinia glomerata* and *Vaccinium Mortinia* relieved any possible suggestion of monotony.

By no means the least unusual feature seen during the morning was the pleached walk of Laburnum laid out 70 years ago over twin Yew hedges. It was densely draped with golden blossom which would presently fall and carpet the pathway.

The morning itinerary was concluded with an inspection of the greenhouses, where we saw the collection of Java Rhododendrons, the white Cypripediums for which Bodnant is famed, the fernery, entered through a living curtain of *Russellia*, and a wide range of ornamental plants.

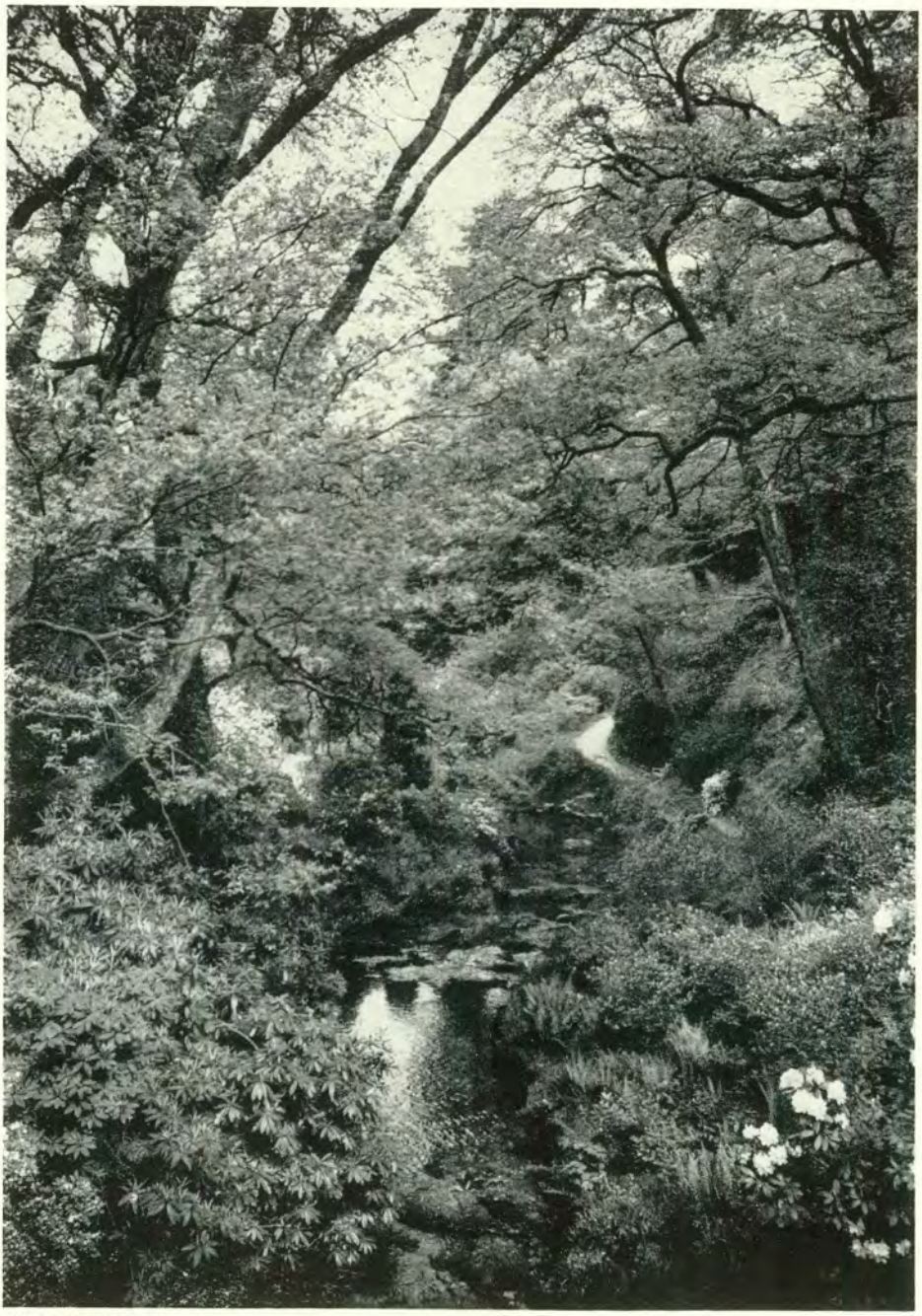
In the afternoon some members of the party wandered about by themselves in search of photographs and the remainder were taken for another delightful walk by the President, past the North side of the terraces and along the Magnolia Avenue where almost all the species are planted in pairs, with Camellias, Escallonias, *Hamamelis mollis* and other shrubs to extend the flowering season. Descending through the Rock Garden, constructed on both banks of a small stream tributary to the Hiraethlyn we crossed the Dell and climbed the slopes on the South-west side. Along the paths, shaded by the canopy of Douglas Fir and Pine, and drawing nourishment from a moist clay soil, are many grand Rhododendrons. The 'Penjerrick' walk, as its name indicates, exhibits a number of forms of that exquisite hybrid, both cream and pink, in company with other

FIG. 31—The Gardens at Penjerrick, Cornwall (See p. 120)

*Photos, N. K. Gould*

THE RHODODENDRON TOUR

FIG 32—The view from the Terrace at Bodnant (See p. 127)



*Photo, N. K. Gould*

THE RHODODENDRON TOUR

FIG. 33—Rhododendrons in the Dell at Bodnant (See p. 127)

distinguished *R. Griffithianum* hybrids such as 'Cornish Cream' and 'Beauty of Tremough.' Continuing up the Dell towards the Mill-pond at its head we found some more lovely conifers: the rare *Athrotaxis selaginoides* and *Dacrydium Franklini*, both Tasmanian; *Pinus Ayacahuite* and the glaucous form of *P. Montezumae* from Mexico; the Chinese *Cephalotaxus Fortunei*, *Larix Potaninii* and *Tsuga chinensis*. There must, however, be a limit to what one can see in a single day in a garden such as this; and we were obliged, all too soon, to make our way back, with a final quick look at the propagating department and the frames. There was no lack of good things here. At the foot of a sunny wall *Hesperoyucca Whipplei* had sent up its giant inflorescence, and *Beschorneria yuccoides*, not to be outdone, was opening greenish, Fuchsia-like flowers on a tall, coral-coloured scape. The frames contained a galaxy of choice plants including *Primula nutans*, *Alstroemeria pelegrina*, *Ourisia macrophylla*, *Calanthe tricarinata* and *Myosotidium nobile*. It was with gratitude that we took leave of our host and made our way back to Bettws-y-Coed, where the experiences of the day provided rich material for the after-dinner discussion which had become our usual evening diversion.

So came the last day of the tour with its long drive to London, and it might have been extremely fatiguing, but for the gracious thought of MRS. MARTINEAU, who invited us to visit her and rest awhile in her garden at Knowle in Warwickshire. It was restful indeed to leave the coaches and stroll in this simple garden along woodland paths bordered by forget-me-nots and bluebells, and later to sit on the terrace and enjoy the afternoon tea so generously provided for us.

Good work on the part of our drivers brought us to London in the early evening, and the first Rhododendron Tour was at an end. It was voted by all a great success, and many expressed hope that other garden tours of a similar character might be arranged for the future.

# THE RHODODENDRON SHOW 1949

By N. K. GOULD

THE exhibition arranged in conjunction with the Rhododendron Conference was memorable both for the extremely wide range covered by the exhibits and for the high quality of the flowers exhibited. The Society was greatly honoured by a visit by Her Majesty the Queen on the second day, and on both days the attendance was highly satisfactory. The arrangement of the Hall was admirable. Down the centre were the imposing floor groups, on the wall-spaces adjacent to the main entrance the larger exhibits of cut blooms, and on the long wall opposite a great collection of botanical paintings from the Royal Botanic Garden, Edinburgh. Along the aisles between the central display and the wall exhibits tiered tables accommodated most of the competitive classes, but the entries were so numerous that the classes overflowed into the annexes.

GROUPS

Occupying nearly the entire length of the North end of the hall MESSRS. W. C. SLOCOCK, LTD., of Woking, staged a superb collection, awarded the Gold Medal, consisting largely of hardy hybrids, with one or two examples of the more striking species. In the centre, huge bushes of 'Loderi' var. 'Game Chick' and var. 'King George' full of flower at once attracted the eye, and these were supported on one side by a mass of the rich rose-pink 'Betty Wormald' and on the other by 'Purple Splendour.' Some other components of this splendid group were 'Mrs. Furnival,' 'Margaret,' 'Mrs. Ashley Slocock,' 'Mrs. Davis Evans' and 'Faggetter's Favourite'; and at one end stood the finest bush of *R. litiense* we remember having seen exhibited, a mass of delicate sulphur-yellow flowers.

THE SUNNINGDALE NURSERIES, Windlesham, also won a Gold Medal for a large floor exhibit consisting entirely of small-flowered Rhododendrons in a restricted colour-range. While all the material used was good, there was nothing of outstanding novelty, and much of the merit of the exhibit lay in the tasteful and uncrowded arrangement. Several large bushes of *R. Augustinii* dominated one end, and were balanced by some upstanding specimens of *R. reticulatum* in a well-coloured form, *R. oreotrephes* and a pale *R. Schlippenbachii* in lovely condition. The corners were furnished with compact bushes of the pink Kurume Azaleas 'Azuma Kagami' and 'Hinomayo'; and the groundwork

consisted of smaller plants of various Lapponicum species among which *R. scintillans* was prominent, and several Azaleas of the Vuykiana group.

In MESSRS. HILLIER & SONS' exhibit from Winchester the groundwork was formed of small bushes of several good hardy hybrids arranged closely together, and rising above these were clumps of the smaller-flowered Azaleas including 'Azuma Kagami,' the carmine 'Benigiri,' 'Hinomayo' and 'Kirin' in their clear pink tones and the white 'Shin Seikai'; while even taller specimens of *R. concinnum*, *R. Augustinii* and *R. Vaseyi* mingled to produce a filmy cloud of pink and mauve. The exhibit was awarded the Silver-gilt Flora Medal.

From THE COMMISSIONERS OF CROWN LANDS, Windsor, came a large wall exhibit of cut sprays, all in fine condition, but too numerous to list. The front was occupied by massed Kurume Azaleas, and among those behind we noticed especially 'Lady Chamberlain,' *R. Davidsonianum*, *R. Augustinii*, *R. orbiculare*, *R. reticulatum*, *R. Vaseyi* and *R. campylocarpum*. The Silver-gilt Banksian Medal was awarded for this group.

MESSRS. J. WATERER, SONS & CRISP, LTD., of Bagshot, staged an exhibit consisting entirely of Azaleas, with a large centre feature of *R. obtusum amoenum*, around which were set bushes of 'Hinomayo,' 'Orange Beauty,' 'Fedora' and 'Fidelio,' a pair of deep rose-pink *malvatica-Kaempferi* hybrids, 'Betty,' an orange-flushed pink of the same group, and *R. mucronatum* in its large-flowered variety *Noordtianum*.

The exhibit from the KNAP HILL NURSERY, Woking, consisted mainly of some good specimen plants of the large-flowered hybrids, including the light pink 'Corry Koster,' 'Madame de Bruin' in cerise-red, 'Fastuosum plenum,' an old but indispensable double mauve variety, and 'Purple Splendour'; with an extra large bush of 'Loder's White' dominating the centre.

MESSRS. G. REUTHE, LTD., of Keston, staged a corner group of cut sprays of a large number of species and hybrids; MR. F. STREET, of Woking, put up a small floor group of pink Kurume Azaleas around a centre-piece of the older hardy hybrids; and the Belgian Ministry of Agriculture brought about thirty large pot- and tub-specimens, trained as pyramids, of double varieties of 'Azalea indica' in a wide range of colours. Unfortunately they were not labelled clearly enough to be very instructive.

An exhibit of outstanding interest from the ROYAL BOTANIC GARDEN, Edinburgh, consisted of nearly one hundred and eighty large, framed, coloured illustrations of Rhododendron species representing the series of the genus. Together with distribution maps, statistical tables and photographs of Rhododendrons in

their natural habitats these covered the wall for the whole length of the hall.

The group from the Society's gardens at Wisley took the form of a tiered wall display of vases of cut branches and trusses. A very extensive selection of species and hybrids, including practically everything flowering at Wisley at the time, was brought up. A second, and smaller table exhibit was designed to illustrate the propagation of Rhododendrons, and attracted a good deal of attention.

### COMPETITIVE CLASSES

The number of classes greatly exceeded that of the previous year, and for the most part they were well filled. The flowers shown represented a very large number of species and hybrids, and were generally of high quality. The first eight classes were open only to amateurs, the remainder open to all.

In Class 1, for one truss each of eight species, LORD ABERCONWAY'S entry, placed first, comprised bold trusses of *basilicum*, *Falconeri* and *rex*, a pale lilac *habrotrichum*, a fine clean *Griffithianum*, *Fortunei*, *campanulatum* and *haematodes*. MAJOR DE ROTHSCHILD showed a varied set for second place. They were the uncommon blood-red *gymnocarpum*, *anwheiense* with a tight truss of pale blush bells, the white, crimped blooms of *Roxieanum*, a pleasing orange *caloxanthum*, *chaetomallum*, *haematodes*, *crinigerum* and *theiocroum*, a mustard-yellow species of the Boothii Series. The third place was taken by SIR HENRY PRICE'S entry of *Wightii*, *Thomsonii*, *Falconeri*, a good rose *glischrum*, *campylocarpum*, *haematodes*, blood-red *arboreum* and *fictolacteum*.

LORD ABERCONWAY was the winner in Class 2, for one truss each of three species. He showed a perfect white *fictolacteum*, a fringed, shell-pink *vernicosum*, and *neriiflorum*. COL. R. S. CLARKE was second with a clear yellow *campylocarpum*, *strigillosum* and *vernicosum*. The third prize entry, from ADMIRAL WALKER-HENEAGE-VIVIAN, comprised a large, even truss of *Thomsonii*, *euchaites*, and a four-flowered truss of *Lindleyi*. There were five other entries, among them an interesting set from MRS. J. MAGOR: *Meddianum* var. *atrokermesinum*, large and intensely rich, the fragrant *Lyi*, and a white, heavily-spotted *irroratum*.

Class 3 called for one truss each of eight hybrids, and was won by LORD ABERCONWAY'S group, in which 'Thais,' 'Penjerrick,' 'Fair Maiden,' 'Siren' and *eximium* × *argenteum* were outstanding. Some equally lovely flowers in MAJOR DE ROTHSCHILD'S second prize entry were 'Idealist,' 'Naomi' var. 'Pixie,' 'Yvonne'

THE RHODODENDRON SHOW

FIG. 34—*R.* 'Fortune' (*R. sinogrande* × *R. Falconeri*)

The Loder Challenge Cup was awarded to E. de Rothschild, Esq., for this exhibit (See p. 133)

var. 'Pride,' 'Mariloo' and 'Nehru.' ADMIRAL WALKER-HENEAGE-VIVIAN was third with 'Singleton Blue,' 'Taranto,' 'Cornish Cross,' 'Earl of Athlone' and other good things.

In Class 4, for one truss each of three hybrids, MAJOR DE ROTHSCHILD was first with the intense, blood-red 'Querida,' the cream 'Carita,' and 'Fortune' with huge sulphur bells above glossy, crinkled foliage. The HON. JOHN McLAREN was second with the rosy-carmine 'Coreta,' 'Laura Aberconway' and *Hodgsonii* × *sinogrande*; and LORD ABERCONWAY third with 'Matador,' 'Queen Wilhelmina' × *Griffithianum*, and 'Cornish Cross' × 'King George.'

In Class 5, for a single truss of one species, the McLaren Challenge Cup went to the HON. JOHN McLAREN for a grand truss of the Kingdon-Ward rose-tinted *fictolacteum*. (Fig. 36.) ADMIRAL WALKER-HENEAGE-VIVIAN'S *Lindleyi* was second, and MAJOR DE ROTHSCHILD'S orange *chaetomallum* third. The Loder Challenge Cup, awarded in Class 6 for the best truss of a hybrid, was won by MAJOR DE ROTHSCHILD with a superb head of the remarkable 'Fortune.' (Figs. 33, 34.) The HON. JOHN McLAREN won second place with 'Laura Aberconway,' and SIR GILES LODER showed 'Loderi' var. 'Pearly Queen' for the third place. In the same class MRS. MAGOR and MR. J. B. STEVENSON showed 'Damaris' and LORD ABERCONWAY put in 'Cornish Cross' × 'Kewense.'

Class 7 required a set of six hybrids raised by, or in the garden of, the exhibitor, and the Crosfield Challenge Cup for the best entry was secured by MAJOR DE ROTHSCHILD with a group including 'Queen of Hearts,' 'Fortune,' 'Day Dream,' 'Naomi,' 'Idealist' and 'Gaul.' LORD ABERCONWAY won second place with 'Peace,' 'Asteno,' 'Blue Bird,' 'F. C. Puddle,' 'May Morn' and 'Lady Chamberlain' var. 'Bodnant Yellow.' SIR GILES LODER'S exhibit, placed third, contained some lovely 'Loderi' varieties, as well as the coral-pink 'Red Glow' and *Thomsonii* × 'Glory of Leonardslee.'

A magnificent spray of a good blue *Augustinii* won for LORD ABERCONWAY the first prize in Class 8, for a single spray of either a species or a hybrid. For the second place MAJOR DE ROTHSCHILD showed the amethyst 'Eleanore' (*desquamatum* × *Augustinii*), and SIR GILES LODER'S clear yellow *campylocarpum* secured third place.

A single truss of *R. arboreum* or one of its subspecies was specified for Class 9, the first and third places being taken by LORD ABERCONWAY and MR. STEVENSON respectively with fine trusses of *arboreum roseum*. MISS E. GODMAN'S neat specimen of *zeylanicum* filled the second place. The next class, for any other species of the Series Arboreum, attracted only two entries, a

lovely clear lavender *niveum* from MR. STEVENSON, and *argyrophyllum*, with a dense truss of rose-pink, from LORD ABERCONWAY.

In Class 11, for a truss of any species of the Series Barbatum, COL. CLARKE'S *strigillosum* was placed first, MR. STEVENSON'S heliotrope-shaded *habrotrichum* second, and LORD ABERCONWAY'S truss of the same species third. MAJOR DE ROTHSCHILD showed *anwheiense*, and SIR HENRY PRICE *habrotrichum*.

Class 12, for a truss or spray of any species of the Series Boothii, was well supported. LORD ABERCONWAY secured the first and second places with a spray of the deep yellow *megeratum* and a very floriferous purplish-rose *tephropeplum*; MISS GODMAN entered a pretty, clear pink *deleiense* for the third place. LORD ABERCONWAY also showed *leucaspis*, MAJOR DE ROTHSCHILD *theiochroum*; and *tephropeplum* came from MR. STEVENSON, ADMIRAL WALKER-HENEAGE-VIVIAN and MR. J. HOWLETT.

In Class 13 a truss of any species of the Series Campanulatum was required. MESSRS. SLOCOCK entered *Wallichii*, with lilac flowers and differing from *campanulatum* in the sparse leaf-tomentum, and won the first prize; LORD ABERCONWAY'S *lanatum*, with pale, sulphur-yellow bells and neat, brown-felted leaves, was placed second; and SIR GILES LODER'S light blue *campanulatum* third.

MAJOR DE ROTHSCHILD and MR. STEVENSON took the prizes in Class 14 with clear ivory-white exhibits of *Falconeri*. Some beautiful examples of *fictolacteum* appeared in Class 15, the HON. JOHN MCLAREN heading the prize-list with a noble head of the pink variety, LORD ABERCONWAY following with a white, crimson-blotched one, and SIR GILES LODER being third with a similar flower. Five other almost equally good specimens were entered.

In Class 16, for a truss of any species of the Series Falconeri not represented in the two earlier classes, MR. STEVENSON'S *rex*, with broad, lilac blossoms, was first, and the same species from LORD ABERCONWAY third. COL. CLARKE entered for the second place a nice truss of the pale yellow, maroon-blotched *arizelum*. The last-named species was also shown by several other exhibitors, and one example of *basilicum* came from Bodnant.

Class 17, for a truss of *Griffithianum*, was poorly supported, and only two prizes were awarded, to ADMIRAL WALKER-HENEAGE-VIVIAN and LORD ABERCONWAY. The next class, however, admitting any other species of the Series Fortunei, was better filled. SIR GILES LODER took the first prize with a fine tall truss of *Fortunei*, MISS GODMAN was second with *erubescens*, and ADMIRAL WALKER-HENEAGE-VIVIAN third with a bold truss of *calophytum*. LORD ABERCONWAY showed *vernicosum*, MAJOR

DE ROTHSCHILD *orbiculare*, and MR. STEVENSON a delicate mauve-pink example of *vernicosum* var. *euanthum*.

In Class 20 *grande* was beautifully shown by ADMIRAL WALKER-HENEAGE-VIVIAN, in a clear ivory-white form, and a truss of pale mauve-flushed, frilled flowers was entered by MISS GODMAN. The next class, for a truss of the Series Irroratum, contained only two entries, of the type species, from MRS. MAGOR and SIR HENRY PRICE. The Series Lacteum was represented in Class 22 by three prize-winning trusses of *Wightii*, from SIR HENRY PRICE, LORD ABERCONWAY and MR. ARMYTAGE MOORE; and one of the white *Traillianum* from MAJOR DE ROTHSCHILD.

Class 23 required a truss of a species of the Subseries Megacalyx, and MAJOR ADAMS-ACTON won the first prize with a lovely six-flowered truss of the fragrant white *Taggianum* in perfect condition. LORD ABERCONWAY'S *sinonuttallii* had seven massive white flowers supported by handsome rugose foliage, and the third place was occupied by a nice truss of *Lindleyi* from ADMIRAL WALKER-HENEAGE-VIVIAN. Other species of the Series Maddenii were catered for in Class 24, where the last-named exhibitor secured the only prize awarded with a good truss of *Johnstoneanum*.

Richly-coloured specimens of *haematodes* and *catacosmum* from Bodnant occupied the two first places in Class 25, for any species of the Subseries Haematodes, and a very dark form of *haematodes* from THE COMMISSIONERS OF CROWN LANDS was placed third. In Class 26, for any species of the Subseries Neriiflorum, LORD ABERCONWAY'S *neriiflorum* filled the first place, ADMIRAL WALKER-HENEAGE-VIVIAN was second with *euchaites*, and MISS GODMAN was awarded the third prize for *neriiflorum*. In the following class, for a species of the Subseries Sanguineum, other than *aperantum*, LORD ABERCONWAY showed an un-named species with flared, blood-red flowers, and the HON. JOHN MCLAREN entered a truss of *sanguineum* with small flowers of the darkest maroon.

Two interesting and rather uncommon flowers were shown in Class 28, for a truss of any species of the Series Taliense. LORD ABERCONWAY showed *Wasonii*, in a truss of eight creamy-yellow flowers, the stem bearing neat, ovate leaves coated beneath with thick cinnamon tomentum. SIR HENRY PRICE brought *taliense*, with a full truss of white, red-spotted flowers on red pedicels.

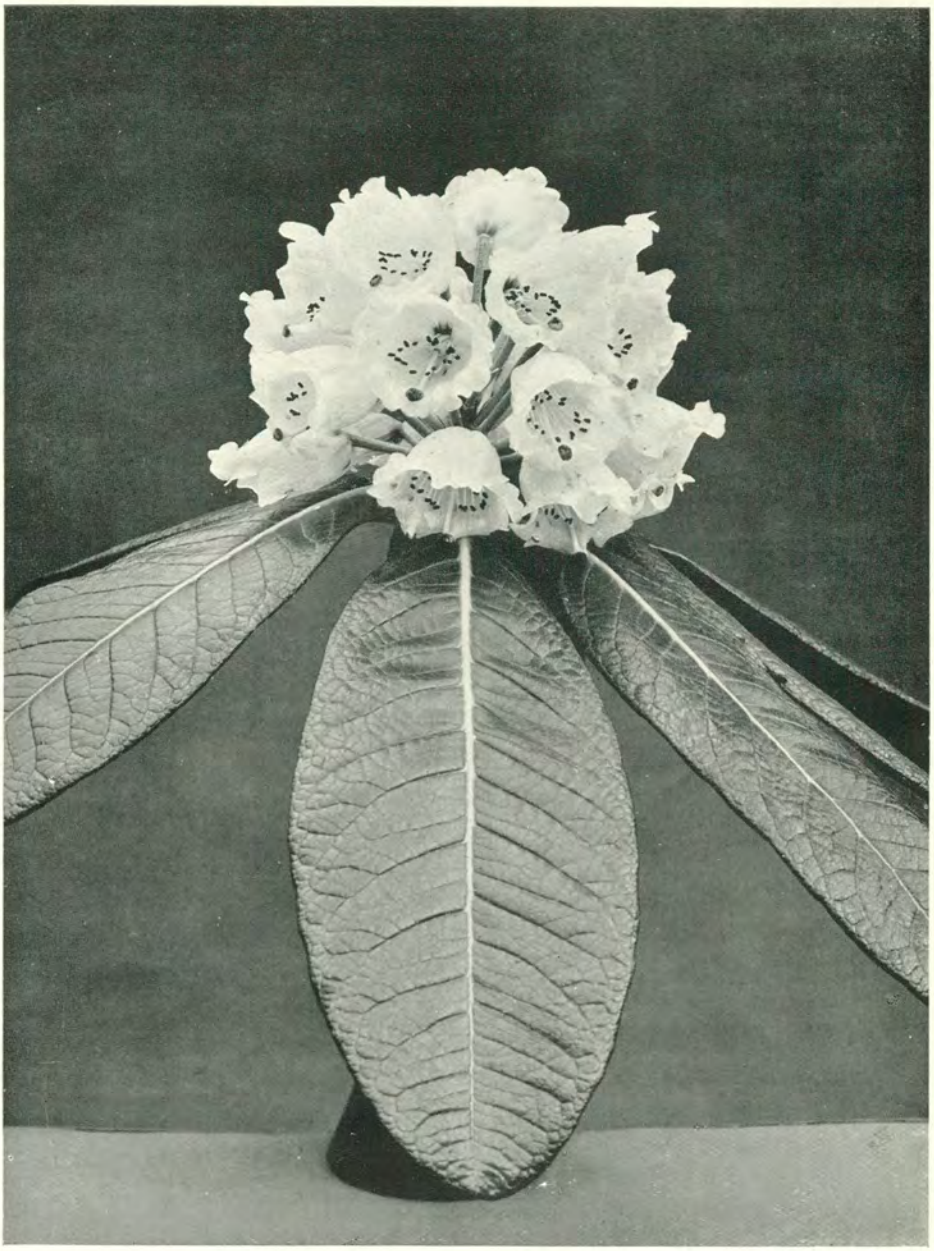
In Class 29, for the Series Campylocarpum, SIR GILES LODER won the first prize with a shapely branch of a clear yellow *campylocarpum*, and the same species gained second and third places for COL. CLARKE and MAJOR HARDY, respectively. The next

class, for the Subseries Martinianum or Selense, mustered only one exhibit—a spray of *rhaibocarpum* from LORD ABERCONWAY, with medium-sized, soft mauve-pink, frilled bells. *Williamsianum* was the only species forthcoming in Class 31, for the Subseries Souliei, and the prizes went to LORD ABERCONWAY, ADMIRAL WALKER-HENEAGE-VIVIAN and SIR GILES LODER, in that order. Similarly, the class for the Subseries Thomsonii produced only *Thomsonii* in slightly differing forms, from SIR GILES LODER, ADMIRAL WALKER-HENEAGE-VIVIAN and SIR HENRY PRICE.

Class 33, for a spray of one deciduous species of the Subseries Azalea, was much more popular. MR. STEVENSON took first prize with his rich pink *Schlippenbachii*, LORD ABERCONWAY'S dark-coloured *Albrechtii* was second, and a large specimen of *Vaseyi* from THE COMMISSIONERS OF CROWN LANDS was given the third place. There were seven other entries, including *reticulatum* and *quinquefolium*. In the next class, where three species were required, LORD ABERCONWAY made the best entry of *reticulatum*, *Schlippenbachii* and *Albrechtii*, and the second and third places were taken by exhibits from THE CROWN LANDS and MR. STEVENSON, respectively, with *reticulatum*, *Schlippenbachii* and *Vaseyi*.

Nine entries were received in Class 35, for a spray of any evergreen Azalea. ADMIRAL WALKER-HENEAGE-VIVIAN was awarded the first prize for a very large and dense branch of 'Hinodegiri'; SIR GILES LODER and THE CROWN LANDS showed almost equally fine specimens of 'Hinomayo.' 'Orange Beauty' came from Bodnant and MESSRS. WATERER; *pulchrum* var. *tebotan* was shown by MAJOR DE ROTHSCHILD; and MR. W. I. WHITAKER and MR. N. G. HADDEN both contributed 'Azuma Kagami.' For the three evergreen Azaleas asked for in Class 36 SIR GILES LODER selected 'Hinomayo,' 'Hinodegiri' and *mucronatum*, winning the first prize; the second went to MAJOR DE ROTHSCHILD, who entered 'Hinomayo,' 'Seikai' and 'Eddy'; and THE COMMISSIONERS OF CROWN LANDS put in *obtusum* var. *amoenum*, 'Hinomayo' and an unlabelled pink Kurume.

In Class 37 one spray of any species of the Series Anthopogon was specified. LORD ABERCONWAY staged a clear white *cephalanthum* and MR. STEVENSON *trichostomum* var. *radinum* in pale pink. The only entry in the next class, for the Series Campylogynum, was a rosy-lilac form of *myrtilloides* from COL. CLARKE. Only one prize was awarded in Class 39, for a spray of the Series Edgeworthii, and this went to MR. J. HOWLETT for a fragrant white flower shown as *seinghkuense* (K. W. 6793), but almost certainly *bullatum*.

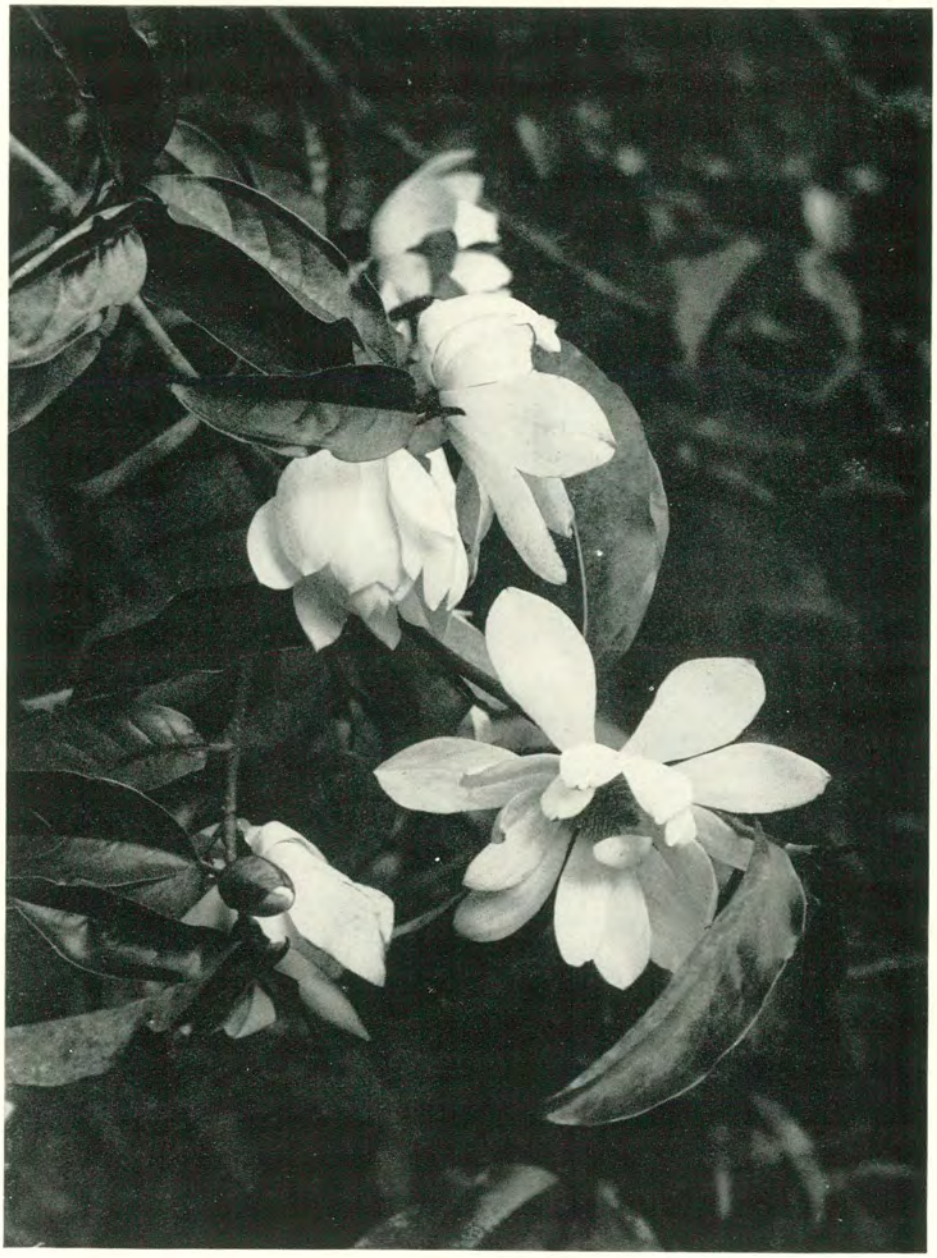


THE RHODODENDRON SHOW

FIG. 35—*R.* 'Fortune'

RHODODENDRON SHOW

FIG. 36—*R. fictolacteum*, the Kingdon-Ward rose-tinted form. Exhibited by the Hon. John McLaren. The McLaren Challenge Cup was awarded for this exhibit
(See p. 133)



THE GARDENS AT CAERHAYS CASTLE

FIG. 37—*Michelia Doltsopa* (See p. 147)

FIG. 38—*Michelia Doltsopa* (See pp. 147 and 149)

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FIG. 39—*R. leucaspis* × *bullatum* (See p. 151)

In Class 40, for a spray of the Series Glaucum, only the species *glaucum* was shown, in several forms. The prize-winners were SIR GILES LODER, MESSRS. SLOCOCK and ADMIRAL WALKER-HENEAGE-VIVIAN. In the next class, for the Series Heliolepis, SIR HENRY PRICE filled the first place with a large branch of a nice rosy-lilac *heliolepis*, and the same species was shown by SIR GILES LODER for the third place, MAJOR HARDY being second with a large-flowered lavender form of *rubiginosum*.

The Series Lapponicum, in Class 42, was represented by a goodly variety of kinds. SIR HENRY PRICE and COL. CLARKE chose *russatum*, taking first and second places; THE COMMISSIONERS OF CROWN LANDS were third with *scintillans*. LORD ABERCONWAY showed *ravum*, SIR GILES LODER *hippophaeoides*, MR. STEVENSON *cuneatum* and MAJOR DE ROTHSCHILD *chryseum*. In Class 43, for the Series Lepidotum, *Baileyi* was selected by both SIR HENRY PRICE and LORD ABERCONWAY, the only competitors. The next class, for a spray of the Subseries Forrestii, had one entry only, of *repens* var. *chamaethauma* (K. W. 5847) from COL. CLARKE.

MR. STEVENSON won the first place in Class 45, for a spray of *saluenense*, and the other two places were filled by *calostrotum* and *saluenense*, both from LORD ABERCONWAY. The Series Scabrifolium was represented in the following class by *spinuliferum*, which won the first prize for LORD ABERCONWAY and the third for SIR GILES LODER, and by *spiciferum*, shown by MAJOR DE ROTHSCHILD and placed second.

In Class 47, for a spray of any species of the Series Trichocladum, the first place was given to SIR HENRY PRICE'S *mekongense*, with small, lemon-yellow flowers and bronze-tinted leaves, LORD ABERCONWAY'S *trichocladum*, similarly coloured, coming second, followed by MR. STEVENSON'S *chloranthum*, in yellow shaded with terra-cotta.

Ten entries were received for Class 48, limited to *Augustinii*. The winning spray, from MR. STEVENSON, was of an excellent clear blue variety, and the next two, from LORD ABERCONWAY and THE COMMISSIONERS OF CROWN LANDS respectively, were also very choice. The following class, for other species of the same Subseries, could only boast two entries, both of *chasmanthum*, from MAJOR DE ROTHSCHILD and LORD ABERCONWAY, the first a bright blue, the latter a mauve-blue form.

LORD ABERCONWAY showed *timeteum* for the first place in Class 50, reserved for the Subseries Oreotrephes, and the same species from MAJOR DE ROTHSCHILD was given third place. Between these two came SIR GILES LODER'S *oreotrephes*. Only two species appeared in the next class, for the Subseries Polylepis.

MR. STEVENSON'S deep red-violet form of *pseudoyanthinum* won the first prize, and THE COMMISSIONERS OF CROWN LANDS entered a slightly paler form for second prize. SIR HENRY PRICE was given third place for his *concinnum*, and this species was entered by several other competitors.

In Class 52, for any species of the Subseries Triflorum, LORD ABERCONWAY entered a very bright *ambiguum*, winning first place; THE COMMISSIONERS OF CROWN LANDS being second with *xanthocodon*, a species with buff-yellow, tubular flowers and neat, elliptic leaves. ADMIRAL WALKER-HENEAGE-VIVIAN showed *bauhiniiflorum*, in appearance like a rather full-coloured *ambiguum*. The very decorative members of the Subseries Yunnanense made a striking display in Class 53, where a lovely compact branch of *caeruleum album*, from LORD ABERCONWAY, won the first prize. Next came a bright, clear pink *Davidsonianum*, also from Bodnant, and the same species in a somewhat paler form from MAJOR DE ROTHSCHILD was third. Among the other exhibits we noted *charianthum*, *pleistanthum* and *yunnanense*.

Class 54 catered for any species inadmissible in the foregoing classes, and in the first place appeared the new species *Aberconwayi* with typical saucer-shaped flowers flushed with rose-pink, from LORD ABERCONWAY, who also showed a very beautiful, wide-flared form of *concatenans*. MAJOR DE ROTHSCHILD entered a truss of the rich blood-red *gymnocarpum*.

Most of the later classes were for hybrids, starting with Class 55 for a single truss of any variety of 'Loderi.' MR. HOWLETT'S 'King George' was first, ADMIRAL WALKER-HENEAGE-VIVIAN showed the same variety for second place, and LORD ABERCONWAY'S 'Koodoo' was third. Several other very handsome specimens were entered. In Class 56, for any *Griffithianum* hybrid other than 'Loderi,' 'Penjerrick' or 'Mrs. Randall Davidson,' SIR HENRY PRICE showed a very striking truss of 'Lamellen,' LORD ABERCONWAY entered one of the *arboreum* hybrids, and the HON. JOHN McLAREN put up a good example of 'Cornish Cross.' Class 57 asked for a hybrid between *Griffithianum* and a hybrid, and here the two first places were occupied by *Griffithianum* × 'Cornish Cross' (un-named) and 'Camilla' with a high truss of blush-rose flowers on purple pedicels, both from Bodnant. From Exbury came 'Yvonne' var. 'Pride,' and several other exhibits of flowers of similar character were staged.

Class 58, for 'Penjerrick' or 'Mrs. Randall Davidson' attracted some entries of the highest quality. LORD ABERCONWAY, ADMIRAL WALKER-HENEAGE-VIVIAN, and MR. WHITAKER all showed 'Penjerrick' in the pink-tinted forms with red styles and

pedicels; MR. STEVENSON and MR. ARMYTAGE MOORE entered the almost white forms with yellow styles.

As was to be expected, Class 59, for any hybrid of the Subseries Campylocarpum or Souliei, other than 'Penjerrick' or 'Mrs. Randall Davidson,' was filled with a variety of fine flowers. THE COMMISSIONERS OF CROWN LANDS won the first prize with a lovely twelve-flowered truss of 'Gladys,' ADMIRAL WALKER-HENEAGE-VIVIAN was second with 'Unique,' and MAJOR DE ROTHSCHILD third with 'Carita' var. 'Golden Dream' in ivory-white relieved by crimson pedicels and nearly black stigmas. Among the other entries the most conspicuous was MR. STEVENSON'S pale lemon-yellow 'Damaris.'

LORD ABERCONWAY was without a rival in Class 60, for a hybrid of the Series Neriiflorum, and filled the three first places with glowing, blood-red flowers of 'Welkin,' 'Aspansia' and 'Hiraethlyn.' Class 61, for any *Thomsonii* hybrid, allowed exhibitors plenty of choice, and the entries were most varied. MAJOR DE ROTHSCHILD chose 'Cornish Cross' and his perfect truss won first place, ADMIRAL WALKER-HENEAGE-VIVIAN showed an immense head of 'Luscombei,' and SIR GILES LODER entered a neat, fourteen-flowered truss of 'Gem' with medium-sized, carmine blooms of most attractive form.

Class 62, for a truss of any hybrid of *Griersonianum*, provided a brilliant display. The first prize was awarded to LORD ABERCONWAY for an un-named hybrid of *Griersonianum* × *Delavayi* with a compact truss of narrow, crimson-scarlet bells and long, pointed leaves. COL. CLARKE took the second prize for *arboreum* × *Griersonianum*, similar in colour to the preceding, and the HON. JOHN MCLAREN'S exhibit of 'Laura Aberconway' was placed third. The last-named hybrid was also shown by LORD ABERCONWAY, with 'Matador' and 'Siren'; MAJOR DE ROTHSCHILD entered 'Nehru' and ADMIRAL WALKER-HENEAGE-VIVIAN 'Gwilt King.'

'Glory of Littleworth' came from MAJOR DE ROTHSCHILD and MR. HOWLETT, and was the only Azaleodendron represented in Class 63.

In Class 64, for a hybrid of the Series Cinnabarinum, LORD ABERCONWAY exhibited a spray of 'Lady Chamberlain' var. 'Bodnant Yellow' bearing six well-formed trusses. MAJOR DE ROTHSCHILD entered a rather warmer coloured variety of the same hybrid, and MRS. MAGOR showed 'Oreocinn,' a dainty flower of cream shaded with rosy-purple.

Class 65 admitted hybrids of which one parent is a species of the Series Maddenii or Edgeworthii. MAJOR ADAMS-ACTON won the first prize with a charming specimen of 'Perseverance' ('Lady

Chamberlain' × *Roylei*) which had long, bloomy bells of burnt orange suffused with rosy-purple. MAJOR DE ROTHSCHILD showed the only other entry, of 'Chaffinch' ('Countess of Haddington' × *ciliatum*) with a wide-flared, sweetly-scented, blush flower and neat, glossy foliage.

Hybrids between the Series Triflorum and Lapponicum were acceptable in Class 66, but the only entry was of 'Russautinii' (*russatum* × *Augustinii*) from SIR GILES LODER. The next class was for hybrids between the Series Triflorum and any series other than Lapponicum, and MR. HOWLETT secured the first prize with a very pretty branch of 'Eleanore' (*Augustinii* × *desquamatum*). The charming pale sulphur-tinted 'Peace' (*caeruleum album* × *concatenans*), entered by LORD ABERCONWAY, was second, and MAJOR DE ROTHSCHILD'S 'Biskra,' another very distinctive hybrid from *Roylei* × *ambiguum*, third.

In Class 68, for a hybrid of *repens* or *aperantum*, LORD ABERCONWAY, entered a superb spray of 'Elizabeth' which was placed first, MAJOR DE ROTHSCHILD'S 'Carmen' was second, and the third place was given to 'Blush,' a rose-pink hybrid from 'Ouida' × *aperantum*, from Bodnant. There was no entry in Class 69.

Class 70 admitted any hybrid between two species other than those provided for in earlier classes, and the judges selected MAJOR DE ROTHSCHILD'S 'Fortune' for the first place, MESSRS. SLOCOCK'S 'China' (*Fortunei* × *Wightii*) for the second, and an un-named seedling from *eximium* × *argenteum* from LORD ABERCONWAY for the third. The next class was open for any hybrid between a species and a hybrid and excluded from earlier classes. Here, MR. STEVENSON'S 'Blue Diamond,' of very rich colouring, found its way to the first place. MESSRS. SLOCOCK'S 'Goldfort' and LORD ABERCONWAY'S 'Cardinal' were given second and third places, respectively. Class 72 was for a hybrid between any two hybrids not provided for in the foregoing classes. 'Janet,' from MAJOR DE ROTHSCHILD, 'Thais,' from LORD ABERCONWAY, and 'Thunderstorm,' from MESSRS. SLOCOCK, were the winning trio.

There were but two entries in Class 73, for six hardy hybrids raised by nurserymen. MESSRS. SLOCOCK and MAJOR HARDY both arranged representative selections. In Class 74, for a species suitable for the rock garden, MAJOR DE ROTHSCHILD showed *impeditum* and THE COMMISSIONERS OF CROWN LANDS entered both *scintillans* and *impeditum*.

Class 75 was the only class requiring a specimen plant in bloom, not to exceed 4 feet in height, and it is rather surprising that there were not more entries. THE COMMISSIONERS OF CROWN

LANDS brought a perfect bush of 'Hinomayo' and also a compact specimen of *Aberconwayi* with many pale pink trusses.

LORD ABERCONWAY was the sole exhibitor of Rhododendron leaves in Class 76, and he showed *calophytum*, *eximium* × *sinogrande*, *Hodgsonii*, *sinogrande*, 'Sir Charles Lemon' and *Falconeri*.

The final class, 77, for a vase or bowl of flowers, to be judged for their decorative value, comprised three entries, each very different from the others. SIR GILES LODER arranged, in a large and wide glass vase, a colourful mixture of yellow and orange Azaleas, with *Augustinii*, *russatum* and *Roylei* for contrast. *Williamsianum*, *campylocarpum* and other species all found a place, but overcrowding was avoided, and the effect was very gay and pleasing. The second prize exhibit, arranged in a grey glazed vase by the HON. JOHN McLAREN, consisted of branches of ivory-white and yellow flowers, with a bold splash of blood-red low down on one side. The branches had been defoliated, and the lack of foliage made good by the introduction of rather heavy leaves of *sinogrande* or something similar. MAJOR ADAMS-ACTON contributed a simple arrangement on a smaller scale in a tall blue vase. The foundation consisted of *Augustinii*, and with this *Albrechtii*, *yunnanense* and a few flowers of the 'Lady Chamberlain' type were tastefully associated. A small spray of *campylocarpum*, introduced near the centre, provided charming contrast in colour and tone.

# RHODODENDRONS AT CAERHAYS CASTLE

By CHARLES WILLIAMS, M.P.

THERE is a common saying among English and Scotch gardeners, "Oh, you can grow anything in Cornwall." Many years ago we were fortunate enough to learn that we were up against a climate that gave us some advantages but also obstacles to overcome that are not known in most up-country gardens.

Our first enemy is wind as we stick out into the Atlantic like a sign-post and get the full force of every gale from N.E. to West to S.E. without any protection and we were faced with the fact that unless we overcame wind we could grow very few things.

Then there is the legend that "Oh, you get no frost." We do not get as much frost as up the country but we get enough to carry a donkey on the pond at Caerhays for over a week at a time and the sea-water often comes in there. That is one side of frost, but we have a special trouble that far less often affects up-country people. We have few of the bright cold autumn days that really harden off plants for the winter. Very often we get in October, November or December mild moist days after a dry September that induce an early flow of sap. Then a frost comes and the veins of our plants are full of rising sap. These freeze and burst just like an ill-protected pipe in a house. Perhaps the worst instance of this was the mild autumn of 1938. Late in that year there came a sudden change and, although this took place all over the country, with us the damp and mildness of November was much more marked and the result from a sheer killing point of view far worse. We had a young *Magnolia Campbelli* flowering for the first time. The flowers were perfect in the following March and the new growth had just begun in May when it all suddenly withered and the plant died down to ground level. This is only one instance of many plants in that year, but with an ordinary up-country autumn this plant would have survived.

On the other hand, we have one great advantage in that although our trees and shrubs do not ripen their wood so well yet we have more days in the summer and late spring which are damp and have a certain amount of mist or light rain. Therefore, if Cornish plants are sufficiently protected from wind and especially from late spring gales which will strip ordinary trees, such as sycamores or oaks, of every leaf in May and are also protected so that when we get a dry period the winds—particularly summer winds—do not scorch up everything, then we do get a better growth on our plants. If we neglect the wind factor,

no matter from what quarter it may come, then our Rhododendrons just don't grow.

We were slow to learn these things and often only got the knowledge by accident and also the first principles of Rhododendron cultivation. Perhaps the two best things ever done at Caerhays were entirely due to pheasants. About 1897 a long laurel hedge was put round the edge of the top of the hill behind the house purely to give shelter from wind and ground draught for the pheasants. This has now become the main protection for many of our best trees and shrubs, and without it few of the Rhododendrons there would have grown to even half their present size.

The pheasant also loved to make a nice sun-bath under small Rhododendrons and of course scratch the surface roots. To stop this broken sticks were placed round the plants. Then we realised that this was not only the perfect protection but also a perfect trap to collect any leaves drifting around. In due course the sticks rotted and with the leaves became good leaf-mould collected and placed in exactly the right position with the minimum of labour. In other words, quite by chance we arrived at Nature's plan of supplying plants with natural humus. Naturally we also collect all the leaves and rubbish we can to add to this and well-rotted ivy is as good as anything.

Of course, shelter and cultivation plus damp summers have one disadvantage; i.e. brambles and ivy grow at a great pace and brambles layer much more freely in Cornwall. I sometimes look at Norfolk and Sussex brambles. Their growth in feet is about equal to a Cornish growth of a yard.

The first real help we got in our wind battle was *Pinus insignis* which was freely planted in Cornwall. These came in during the 1850's and my grandfather began to plant them at Caerhays. A few years ago one became dangerous to the house and when we cut this one down the trunk was 126 feet long.

My grandfather also collected some Azaleas during his honeymoon in Holland in 1852. We still have two of these but they have never been really well grown.

He only planted a few things within the walls round the house and some of the old 'Cornish Scarlet' in the drive, two of which are now 40 feet high and 50 inches round the trunk a foot above the ground.

In the nineties my father saw Indian Rhododendrons growing well at Heligan and began to plant *arboreums* outside this wall and also made a special new garden for *Rhododendron Aucklandii.* These are now big plants of 20 feet high and have grown into a dense mass. I think they were all but one raised from seed

and he learned the value of seedlings every time if you want first-class plants. The exception was a very fine form that came from Heligan.

He also planted there one of the very early plants of *R. Shilsonii*, which is now about 18 feet high and 20 feet through. We have always considered this one of the three or four best red hybrids for shape and quality. The colour is so much cleaner than almost all the deeper red hybrids that flower later and you seldom see a truss which is not perfect.

There are also about ten plants of the original *R. Williamsianum* and some of these have been able to grow and maintain their real shape: by this I mean full round plants of up to 4 feet high and 12 feet through that are always perfect in foliage all the year round and are usually covered with pale pink flowers so much nicer in quality of colour than most of the Chinese pink Rhododendrons.

In this part of the garden there are some *repens* and hybrids of *repens*, a big *Davidsonianum* hedge, two nice pale *Augustinii* and several other hybrids.

My father also rather before this time bought some of the New Zealand tree ferns that came over to the 1888 Colonial Exhibition and placed them in an old quarry up the drive. They have come up wild from seed in several places and are of great ornamental value planted with Rhododendrons.

About then he made two rockeries outside the wall going up the drive. In the one above the drive he grew several Rhododendrons such as *Maddenii* and in the centre the ordinary *Camellia reticulata* as a standard but when the Chinese Rhododendrons came along he had to destroy this so as to make a place for the smaller forms of Chinese Rhododendrons. Now the best things there are a batch of *R. repens*—a lovely pale form of *R. Augustinii*—which was my mother's favourite plant, and a big old plant of *Maddenii* which must be over 50 years old and is 8 feet high; 'Tebotan,' that queer semi-double Azalea, and a good plant of *R. Wallichii*, which is one of the most vivid colours in the garden, quite hardy, but to retain its colour it must have a shady place.

In the nineties he began hybridizing Rhododendrons. He crossed the blood-red form of *arboreum* with both *Thomsonii* and 'Mrs. Butler'; also both blood-red and white *arboreum* with *Aucklandii*. Here the big laurel fence first became a dominant factor and at the top of the wood about 1900 he put the *Aucklandii* hybrids in the flat centre at the top and the *arboreum* hybrids along the West end of the wood.

Just outside the *Aucklandii* garden mixed with some more

RHODODENDRONS AT CAERHAYS CASTLE

FIG. 40—*R. sinogrande* (See p. 145)

*Photos, J. E. Downward*

RHODODENDRONS AT CAERHAYS CASTLE

FIG. 41—*R. sinogrande* in flower (See p. 145)

tree ferns are four species, *Falconeri*, 22 feet high and 22 feet round, *argenteum* (*grande*), a really big *auriculatum*; this was one of WILSON'S original plants. There is also a very clean form of *sutchuenense* with no blue in the pink. There have come up wild from seed here *Falconeri*, *sutchuenense* and a natural wild hybrid of *argenteum* × *sutchuenense* which is quite one of the largest and best of any early pink hybrids I have seen. It flowered well for the first time in February 1949. The contrast between the foliage of the *Falconeri* and tree ferns I would venture to emphasize as it is this sort of placing that develops the full beauty of the two forms of foliage as both are in their natural conditions with the semi-shade given by Oaks and Chestnuts—which incidentally are ideal leaf-mould producers. (Fig. 47.)

West of the tree ferns is a path running towards the sea and there are a lot of small Rhododendrons on the top side such as *repens* and two hybrids of *moupinense* and quite big plants of *Azalea amoena*. Below are two big plants of the pink *grande*—a raucous violent unpleasant colour—and further down are several fair *Aucklandii* and *sinogrande*. There is a nice group of *moupinense* × *leucaspis* and several beds of various species such as *lutescens*, *hippophaeoides*, *sinogrande* and *flavidum*, with a good many other of the smaller species, such as *didymum*, *repens* and *floccigerum*. Beyond these is a very big bed of mixed Kurumes in front of a hedge of 'Loder's White,' which is a very strong grower and likes the rather heavier soil at this end of the wood. Towards the end of this path and well up in the wood there are some big *sinogrande* (Figs. 40, 41); several *sutchuenense* pink *arboreum* hybrids, one of which is almost always out in January; a big plant of *sutchuenense* × *calophytum* 11 feet across; and a nice group of very good Azaleas which were given to my father by the late COLONEL STEPHENSON CLARKE.

Behind the big fastuosa Bamboos above the *Aucklandii* are one *Magnolia Campbelli* and three *M. Veitchii*, all about 50 feet high. (Fig. 46.) I have included these Magnolias in this account as they are a substitute for Oaks and all round them are growing a lot of Azaleas and Camellias and from these the idea came that we might just as well have flowering trees in the wood as Oaks, with the additional advantage of a much finer foliage. I include the Camellias because their foliage forms a good background for Azaleas and often you can break up the heaviness and lack of colour in Rhododendrons for many months of the year with the various *C. saluenensis* hybrids and *reticulata* species that begin to come out in January.

When you get up to the Laurel hedge there is above it a long strip of wood running roughly south to north.

At the south end of this wood there are a certain number of Waterer hybrids broken up by *Camellia oleifera*, which flowers in November, and also some of the *Aucklandii* × 'Broughtonii' hybrids made by P. D. WILLIAMS and picked off a plant grown by his brother, JOHN WILLIAMS, at Scorrier. There are a lot of these in the woods at Caerhays—some quite good whites, a few clean pinks, an awful red and a queer plant which grows here and which we have always kept because of its quaintness. This plant shows the worst quality of *Aucklandii* and trails along the ground as if it was trying to copy *repens*. So far, in the course of, I suppose, some 50 years, it has never yet grown to 2 feet high in spite of being in good health and well looked after.

There are two inside windscreens; i.e. well within the wood—one of the red berry form of Stranvaesia and the other of Bamboo *fastuosa*—which form two sides of a square and so make some protection for our best *Magnolia Dawsoniana*.

Above is a group of original Chinese species—*auriculatum*, *sutchuenense* and *calophytum*—but they were planted rather close and, although well protected and with lots of leaf-mould, they tend to show signs of age. Below these is a big plant of *Magnolia Sprengeri* var. *diva* and a nice plant of *R. zeylanicum*. Next to the *M. Dawsoniana* is a group of our *R. Griersonianum* × *eriogynum* hybrid.

Below is a bed of the Rhododendron 'Yellow Hammer' that quite often comes out in the autumn and flowers for several months; also clumps of *Camellia saluenensis* hybrids (Fig. 42), and four good-sized plants of the old semi-double *Camellia reticulata* grown as standards. Almost next to the 'Yellow Hammer' is a line of *R. Keysii*, some *aureums* and a group of 'Blue Tit' followed by *Maddenii*, a chance seedling of which quite true to type has come up just opposite below the ride.

Going along the wood are big plants; i.e. over 20 feet high, of what we call 'Cornish Loderi'—a hybrid of *Aucklandii* and *discolor*.

Then we come to the 'Red Admiral' (*arboreum* × *Thomsonii*). The larger of these plants run up to 22 feet high and mixed with these all along the wood are the 'Mrs. Butler' cross. This is perhaps likely to make the biggest plant of all the Caerhays hybrids and should take the place of the old 'Cornish Scarlets,' with the additional advantage that it is a far larger flower and, like most crosses with *Fortunei* blood, strongly scented.

There is a standard plant of *Magnolia Delavayi* which is about our finest foliage plant. The flowers are often underestimated because people will look at them at the wrong time of day. They are perfect only for a couple of hours and as they develop fully by night it is of little use looking at them after 7 A.M.

RHODODENDRONS AT CAERHAYS CASTLE

FIG. 42—*R. Broughtonii* with *Camellia Williamsii* (See p. 146)

Almost below this is the *R. lutescens* × *spinuliferum* hybrid now called 'Crossbill.' The first head gardener at Caerhays, JAMES MARTIN, who really did all the raising of Caerhays seeds until after the First War and was a good judge of beauty, once said to me: "I cannot think why your father ever made an ugly thing like that." He was right when they were small plants as their rather mixed yellow-orange colour is not nice close but now they are a group of 18 feet high the colour at 50 yards or more is very pleasant and tends to look well against the *M. Delavayi*. (Fig. 45.)

There used to be a long row of *Rhododendron ciliatum* but this was broken up to put in groups of Rhododendrons such as *haematodes*, *Griersonianum* and *oleifolium*. There are also some *auriculatum* hybrids here and 'Golden Oriole.'

The main flat at the top of the wood is divided by a broad ride that runs almost west to east. On the northern side is our largest plant of *Magnolia Delavayi*, with *Rhododendron Hookeri* and a group of 'Dr. Stocker' in front of it; also a single specimen of *Michelia Doltsopa*, the finest of all our evergreen shrubs, and which when out on a mild day scents the wood for at least 50 yards round. (Figs. 37, 38.) The main and indeed the original feature of this part of the wood is the two Rhododendron hybrids *Aucklandii* crossed with blood-red *arboreum* and white *arboreum*, while there is a row of four plants of *sutchuenense* × *arboreum* along the ride. These when out are quite white and are one of the best of our white *arboreum* × *sutchuenense* hybrids. When the *arboreum* × *Aucklandii* are going over there follows the *zeylanicum Aucklandii* cross made by P. D. WILLIAMS of Lanarth which is rather deeper in colour than the red *arboreum* cross. These two *Aucklandii* hybrids were made by my father when he had seen the original pink hybrid of *arboreum*/*Aucklandii* at Heligan.

At the far top corner there is a large background of *auriculatum* hybrids that have become one solid mass but there are three or four other single plants of this cross farther along the wood and the length of their flowering period is probably more extensive than any of our hybrids except 'Yellow Hammer.' Among other plants is a good 'Mrs. Henry Shilson,' two fair plants of *cinnabarinum*, two very big plants of 'Bodartianum' and a group of *yunnanense* × *Roylei* which are very close to each other in form but vary in colour. They tend to overflower and become one dense mass of bloom. The whole of this piece has been broken up by a few Magnolias, such as *Delavayi* and *Sargentiana robusta*, and three or four big evergreen Oaks. Perhaps the *M. Delavayi* is the best single plant we have in the garden and this, with the *R. auriculatum* hybrids, usually gives

us some flower to look at from July to late November. We have picked quite a good truss at Christmas.

There are two groups of *Aucklandii* crossed with *campylocarpum*—one made by SMITH of Penjerrick and the other at Caerhays. These vary in colour from a flower with pink tinge to clean yellow. When they had been flowering for some years a seedling came up in the *Aucklandii* garden, clearly made by a bee, which is equal in colour to the best of the yellows, and clearly by the same cross. I think that the late flowering of the *auriculatum* was the reason why my father went in for WILSON'S Chinese Rhododendrons. He knew that there was this late tendency (or occasionally very early in *Fortunei*) and wanted to increase the flowering period of Rhododendrons and this the *auriculatum* did. The first *auriculatum* flower from Caerhays was sent to my father in Scotland, who wired to SIR EDMUND LODER to come over to see it, and this immediately changed his mind on the value of WILSON'S collection. There is also a group of a selected form of *Ririei* that is a strong colour and much more pleasant than most of this species; indeed, because of its earliness, it must rank high in any collection of Rhododendrons.

At the south-west end and below the main ride are two of the original plants of *Camellia saluenensis*. Below is a big old plant of *R. Fortunei*, a group of 'Fragrantissimum,' some fair-sized *triflorum* and two *orbiculare*. These were good plants ten years ago: they then tried to layer but age and the war has almost finished them. I am inclined to think that unless this plant is allowed to layer when it is over 8 feet through you are fighting against Nature and the branches become too long and thin to give sufficient sap to support the very large number of flowers even if the seed does not set or can be taken off.

Beyond are two of the original *Camellia saluenensis* and some of the best of the *saluenensis japonica* Camellia hybrids such as 'St. Ewe'; *Eucryphia glutinosa* (more often known in gardens as *pinnatifolia*); *Magnolia Wilsoni* and then a big bed of *R. Davidsonianum*, followed by an opening in the laurels where there are several plants of a dark form of *R. Augustinii*.

Next come two big plants of *Magnolia Delavayi*. In front of these are several plants of the 'Humming Bird' (*R. Williamsianum* × *haematodes*), and a young seedling of *Magnolia Wilsoni* —the last seedling my father sowed himself and this out of doors. In front of the *M. Delavayi* is also a strip of some of the smaller forms of blue mountain Rhododendron and the Delavayi forms their background.

In the next opening is a group of *R. Martinianum* × *Williamsianum* which keeps a good form of round bush and has as a

background tall plants of red and white *Aucklandii* hybrids, while on the flank is a big *Michelia Doltsopa* which has been photographed. (Figs. 37, 38.)

Behind there is a large plant of Rhododendron 'Loderi' given to my father by SIR EDMUND LODER. This has always had space and was layered so it has been able to grow and is now 33 yards round and 16 feet high. About the bottom centre of this section and just above the laurel hedge is a hedge of *Rhododendron Davidsonianum*. The *arboreum* × *Aucklandii* hybrids formed the original feature of this section of the wood but a lot of WILSON'S original plants were put in here. The best is a big *R. calophytum* and a really nice group of *Houlstonii* with a lot of the *decorum* series. Also a few old White *Aucklandii* hybrids like 'Standishi' and other Rhododendrons as 'Sir Charles Lemon' and 'Beauty of Littleworth,' all broken up by Magnolias. There is a good single plant of *sinogrande*; this is, I think, our best specimen plant and as good a yellow as any of them. There is also, quite close to it, a small group that have rather grown into each other.

At the eastern end of the dividing ride the ground slopes down, at first gradually and then steeply, towards the drive, and the top part of the slope contains two *sinogrande*, two of the best *Thomsonii arboreums*, a single *Thomsonii* and a large group of *barbatum* which was one of the first species put out in the wood.

Rather below are a big lot of *Maddenii* and at the bottom two 'Loderi.' The original bed of 'Yellow Hammer' is at the top of the slope and that cross pleased my father very much because it is as good a yellow as almost any Rhododendron, very free flowering and almost anybody's plant. It is easy to grow and can be kept quite small without very drastic treatment and so can be grown by far more people than—say—*sinogrande*. 'Sir Charles Lemon'—another of his favourites—has made a good group here. He and P. D. WILLIAMS put it for colour and foliage very high. One day I was going round with a fairly competent gardener when the young growth was still upright but just about to flatten out; the near cinnamon colour of the underleaf showed up well in the sun, and he considered it the best thing in the garden on that particular day. Below there are several old *decorum* and three or four plants of the *Maddenii* × *Roylei* hybrid. The pink form is often called 'Royal Flush.' Both grow freely and in a mild damp autumn they often throw out a few flowers in October or November. On the house side of this there is a nice plant of *niveum*, and close to this a big *Falconeri* grown in a small quarry just below the Laurel hedge.

This forms the top plant of a clearing that runs some way down the hill facing about north-east. It contains a largish group of *neriiflorum* and several *lacteum*: some of these are not a good form but two or three are really fine yellows. It is, I think, the most difficult of all Rhododendrons to grow at Caerhays and they never showed the robustness of the Werrington ones. It is apt to die in bits and fade out even if reasonably well looked after. I suspect it prefers a less damp climate and I am inclined to think that it is a plant with a very definite age limit. There are a good many other species here, including *Davidsonianum*, which comes up naturally from seed.

To the west of this and well up from the back of the house is a large clearing made by the big gale of 1929. At the bottom is a long Crinodendron hedge and a ride. The main group here is *calophytum* × *sutchuenense* and 'Mrs. Butler.' These plants have never been cleared out and form one mass. There is a line of *auriculatum* hybrids, containing a few plants of MR. STEVENSON'S very fine 'Polar Bear' cross *diaprepes* × *auriculatum*, a bed of *floccigerum* which has a tremendous variety of colours, some nice plants of *eriogynum*, also a pink *Magnolia stellata*, which does well, and another group of *Maddenii* hybrids.

Incidentally, my father crossed *Griersonianum* with *eriogynum* a good many years ago, and we have four or five groups of this scattered about the wood in different places. They are inclined to over-flower but can be cut back and then break easily. We usually cut some of these hard every year, the *arboreum* hybrids, *Davidsonianum* and other similar species just after flowering, but the smooth-barked Rhododendrons resent cutting intensely and I can only remember pure *Aucklandii* breaking once or twice on the old wood.

Below this and immediately behind the wall opposite the front door is a large block of the old 'Cornish Scarlet.' Some have been cut out and here we have several *Aucklandii* which have done well and were put in at the same time as the first I mentioned. There is a path along behind the wall and next to the wall are quite a lot of various species and hybrids that were originally put there in the seed pans when enough had been taken out and were left in case anyone wanted them. It is curious how these have survived for over twenty years and grown into each other. On the top side of the path there are several plants of *R. moupinense* and some of the best of the smaller Chinese species. This bank is fairly hot and dry and a good deal of it is covered with *Erica mediterranea* which seeds itself all over the place, and a big plant of Pieris which shows up well over the wall from the front door.

Going down the hill at the corner of the wood facing north-east is a big quarry below and two smaller ones above the path. In the first small one is our largest plant of *R. orbiculare* which we have allowed to layer itself. At the top of these quarries are several species and on the west side are two big *auriculatum*; also an old bed of *sulfureum* which got over-crowded during the war and are tending to die out. In the most western of these two small quarries is a nice plant of both *Magnolia Watsoni* and *M. Delavayi*. The bank is covered with *intricatum* and a considerable number of various wild seedlings have come up. At the top is a group of *orbiculare* × *Houlstonii* which my father made very many years ago. This is an attractive pink free flowering and a really good constitution.

In the big quarry below the path there used to be three very big *grande* which were replaced by WILSON's Chinese at the early part of the century. There is an *auriculatum* which was the plant my father used for crossing as it flowered early; a nice *orbiculare*; a *chartophyllum*; a *pseudo-chrysanthum* and at the bottom of the quarry the old *calophytum*, which was moved when a big plant, which flowered well after moving for some years but is now failing. WILSON's *Fortunei* and a very early hybrid Camellia are also there.

On the house side there is a line of *R. Fargesii* backed by *lutescens*. (Fig. 43.) There are a few self-sown *argenteum*, a lot of *lutescens* which on one bank come up like mustard and cress, and also some *Davidsonianum* seedlings. Curiously, although *Davidsonianum* and *lutescens* are often both out at the same time, they never have as yet produced a natural seedling. *R. lutescens* comes out first but with us it is out for many months of the year and so there have been many years when they could have crossed.

As we go down the road to the house, at the top of a Cornish wall of about 3 feet high is *repens* along the top and several groups of various small hybrids made by my father; *leucaspis* × *bullatum* is, I think, the best of these and really sweet scented (Fig. 39); also some species such as *Valentinianum* and *leucaspis* itself. There is a single plant of one of FORREST's original *Camellia saluenensis* which has a perfectly round flower of a rather harsh pink and a group of three plants, two a pale pink that are less perfect in shape than the single plant, and another very like it in colour and form of flower. There is also a very fine red *Meddianum* hybrid made by CHARLES MICHAEL which we call after him. He began life with the keepers and then came into the woods when quite young almost fifty years ago. He and GEORGE BLANDFORD have planted most of the things in the

wood. Both were away for the First War, but since that they have given their whole time to the plants and it is largely due to them that so many of our shrubs do well. CHARLES MICHAEL succeeded MARTIN as head gardener and he and my father would often look at a place several times before they decided to put in a particular plant. Since MARTIN left there has not been any major operation of planting in which CHARLES MICHAEL has not been fully consulted and there is no doubt that much of the natural beauty of the place owes itself to his very close co-operation with my father.

Turning away to the left as we go down this path is another that leads to the big tree fern quarry—these, as I said before, I believe, came to England for the Colonial Exhibition in 1888—and along here are a few *R. Aucklandii* and a good many *sino-grande.*

Below and along the drive are a lot of Azaleas which stretch in groups placed at intervals much of the way along the drive to the top lodge. Many of these are my father's hybrids and some have become large plants or groups of plants. As this drive is exposed to north and east winds it is not of much use for large-leaf Rhododendrons, but Azaleas and other deciduous shrubs do well here. There is a large Benthamia (*Cornus capitata*) about a third of the way up and about the middle a long opening which is filled with various Cherries and Azaleas. There are a few good groups of Rhododendrons worth mentioning. A very fine white *arboreum* which has not a big truss, but a quite exceptionally white flower; one of the 'Broughtoni' hybrids that has a smaller truss than most of them but is, I think, the whitest flower we have of this cross; a bed of *concatenans*; a large group of *lutescens* and *mucronulatum* which are next to each other, and fair-sized plants of 'Nobleanum.' These usually have a good many flowers soon after if not before Christmas. There are also one or two lots of *Camellia saluenensis* hybrids just opposite them. An opening was cut right up the hill into the wood and filled with Hydrangeas that have now become a dense mass. This is seldom without one or two woodcock in winter. There are some old Japanese Maples and at the top end of the drive about six double Camellias and a group of hybrid Camellias, both of which last here for a long time, and I have seen flowers on one of the doubles in June well after all the other Camellias are over.

A good deal of the drive was planted over fifty years ago, but the development has been going on more or less the whole time and there are several Rhododendron hybrids, mostly of the smaller forms. One big group of *eriogynum* × *auriculatum* and *Griersonianum* × *auriculatum* make a nice show when all

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FIG. 43—*R. Fargesii* with *R. lutescens* in foreground (See p. 151)

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FIG. 44—*R.* 'Snow Bunting'

FIG. 45—*R.* 'Crossbill' (See p. 147)

FIG. 46—*Magnolia Veitchii* 60 ft. high (See p. 145)

THE GARDENS AT CAERHAYS CASTLE

FIG. 47—Tree Ferns in the woodland (See p. 145)

RHODODENDRONS AT CAERHAYS CASTLE

FIG. 48—*R. calophytum*

the Azaleas are over and we have lately put out some of the *eriogynum* × *Griersonianum* hybrid which is doing well.

I am afraid I have missed out very many things, but I have tried to give some account of how this wood garden has been made in order to grow those things that naturally fit into our countryside. My father did not aim at big colour effects or vistas and when quite young realized that before he put in any plant he had to consider the result of wind from every possible quarter. He would look at a place many times and almost always after 1920 with CHARLES MICHAEL at least once before he decided what to plant. The result has been that between them they often succeeded in growing strong, healthy plants. As a very distinguished American visitor said to me last summer when he was going round the garden: "These plants seem to have the position and situation that Nature intended for them." But he regretted not having brought his gum-boots.

# NOTES ON SOME HARDY HYBRID RHODODENDRONS

By FREDERICK STREET

DURING a recent "spring-clean" of the office I discovered a parcel of old catalogues published by several of the well-known Surrey firms specialising in Rhododendrons. The oldest of these catalogues is one dated 1886 and it is interesting to see how many varieties it contains which are still grown to-day. Not only are several of those listed widely grown but they are considered better than many newer varieties. The following list shows the varieties contained in the catalogues of 1886 which are still grown and are worthy of the stars (shown against them below) accorded for merit in the *Rhododendron Handbook:*

| | |
|---|---|
| *'Broughtonii' | 2/6 |
| *'Cynthia' ('Lord Palmerston') | 2/6 |
| **'Doncaster' | 5/– |
| **'Fastuosum Fl. Pl.' | 2/6 |
| *'Joseph Whitworth' | 3/6 |
| **'Lady C. Mitford' | 10/6 |
| ***'Lady Eleanor Cathcart' | 2/6 |
| *'Lady Grey Egerton' | 10/6 |
| *'Mrs. R. S. Holford' | 3/6 |
| *'Sappho' | 5/– |

The prices are those of 1886. I have added these not so much as a comment on the present-day value of the pound but to show which were new in 1886 and which had been in cultivation for some time. It takes between thirty and forty years for a new Rhododendron of outstanding merit to become available at the lowest economic price when considerations of rarity have been discounted. It will be seen that 'Broughtonii,' 'Cynthia,' 'Fastuosum Flore Pleno' and 'Lady Eleanor Cathcart' were old in 1886. The synonym for 'Cynthia'—'Lord Palmerston'—is a further indication of the probable date of the introduction of these varieties, namely—between 1840–1850. One of the oldest is 'Lady Eleanor Cathcart' and, as may be seen from the star rating, it is still a very fine Rhododendron. The prices shown are for the usual young plants about 18 inches to 2 feet high. 'Doncaster' is probably of the same vintage as the older plants despite the higher price. It is slower growing and takes

longer to reach the height of 18 inches being of wide and bushy habit.

Of the two most expensive plants in the list, which may be assumed to be the two most recent introductions, 'Lady Clementine Mitford' has received greater public favour in recent years than 'Lady Grey Egerton.'

There are probably two reasons for this discrimination. 'Lady Clementine Mitford' is a first-class Rhododendron—good habit, handsome foliage, large flowers and truss of fine colour make it difficult to fault. The young growth is covered with a white tomentum and is almost as pretty as the flower. In addition, it is perfectly hardy and reliable. 'Lady Grey Egerton' is, perhaps, a little taller growing tending to be leggy. Before the war the colour, soft lilac mauve, was not popular. "No mauve or white" was a rule in many gardens. Whether or not it was a good rule is outside the scope of these notes. Now, with a return to favour or perhaps, more accurately, a lessening of disfavour of all things Victorian, this colour is being more widely used in planting schemes. This seems to be a link with renewed interest in Victorian painters and furniture and, in the garden, an increase in the planting of Conifers.

The other plants in this list are too well known to need further description—with the possible exception of Rhododendron 'Joseph Whitworth.' This plant always reminds me of one of the most knowledgeable men on Hardy Hybrid Rhododendrons that I have known. It was my privilege to work under him for two and a half years when he was the Rhododendron Foreman at a well-known Surrey Nursery. He always became angry if anyone referred to this plant as '*Sir* Joseph Whitworth.' He maintained that it did not necessarily follow that if a man was knighted the plant was also knighted! 'Joseph Whitworth' is one of the few survivors of another colour which was in favour at the end of the last century. The flowers, of good texture, are dark purple lake in colour with black spots in the throat. They form a good truss which stands up well from the large leaves. The habit is bushy resembling that of 'Doncaster.' It is late flowering and hardy. Probably because of its fine habit it is one of the few survivors of many of similar colour. These include 'Cetewayo,' 'Caractacus,' 'Nero,' 'Baron Schroeder' (W. H. Punchard), 'Old Port,' and several others. Most of these, except the two last named, are now lost to cultivation.

The next list contains those plants which were listed in the catalogue of 1886 and which are still widely grown to-day although they are not given the honour of the stars in the *Rhododendron Handbook*. These are:

| | |
|---|---|
| 'Baron Schroeder' (W. H. Punchard) . . | 2/6 |
| 'Chionoides' . . . . . | 2/6 |
| 'Everestianum' . . . . . | 2/6 |
| 'Garibaldi' . . . . . | 5/– |
| 'Govenianum' . . . . . | 1/6 |
| 'John Walter' . . . . . | 3/6 |
| 'Lady Annette De Trafford' . . . | 3/6 |
| 'Michael Waterer' . . . . . | 2/6 |
| 'Mrs. Tom Agnew' . . . . . | 3/6 |
| 'Old Port' . . . . . | 3/6 |

The following plants are included in the other catalogues all of which are over fifty years old. All of these are in cultivation to-day:

'Sir James Clarke'
'Mrs. John Kelk'
**'The Bride'
'Lady Strangford'
'Prometheus'

Some of the lesser known of the varieties listed above are worthy of comment.

'Baron Schroeder' (W. H. Punchard) and 'Old Port' are both interesting and delightful. 'Old Port' is probably the best known. This is a fine hardy hybrid Rhododendron. Its habit is good—one seldom sees a bad plant. Strangely enough, it prefers full sun to part shade. It is hardy and free flowering, hardly ever missing a season without a fine show of bloom. For an old variety it has a good sized truss and the colour is as rich as the name (bouquet, unfortunately, is lacking). The texture of the flower is good and if it were transmuted into liquid it would, undoubtedly, weep on the side of a glass. I had prepared a plant of this variety for Chelsea Show in 1947 which came into flower a fortnight before the show, travelled to the show and lasted well for the whole time. Incidentally, this same plant flowered again in fine quality for the show in 1948 despite the fact that it was not replanted in the Nursery until June 1947.

I describe Rhododendron 'Baron Schroeder' (W. H. Punchard) with some diffidence. This variety is lost in the limbo of the "Y's" and "Z's" of the Handbook—"not now up to the standard of cultivation in the British Isles." It is the only plant so described in the *Rhododendron Handbook* that I have included in my list taken from the 1886 catalogue. My reason for making a plea in its favour is the interest it aroused at Chelsea Show in 1948. This was a difficult show. The date was a little later than usual and the Season about a fortnight early. Most of the plants

one had prepared for the show were either over before it started or they came out with distorted blooms as the result of being artificially held back. This made it necessary to take every plant from the open that was suitable. (I may say that in showing Rhododendrons these are always better than those that have been nursed with special care; it is not possible to do better than Nature.) 'Baron Schroeder' (W. H. Punchard) was one of these plants. The particular plant I chose for the show was in perfect condition—freshly opened with about two pips at the top of the truss still to come out. It is a dark rich plum colour with a golden centre melting into the flower. In fact, the combination is not unlike the inside and outside of a ripe Victoria plum. Again, the flower has a fine rich texture which adds considerably to its charm. One thing it lacks in comparison with 'Old Port'—the habit in a young plant is inclined to be ungainly. But as a large specimen when over 4 feet in height it forms a beautiful shrub. It is possible that its poor habit as a young plant may be the reason for its relegation.

To appreciate the beauty of some of these older Hybrids it is necessary to follow the rules given by MISS GERTRUDE JEKYLL in her book *Wood and Garden*—the "Beckford" of Gardening, for the best arrangement of colour. Using her suggestions for the grouping of colours, charming effects can be obtained with Hardy Hybrid Rhododendrons both old and new.

The most outstanding Rhododendron in the foregoing list is 'Garibaldi.' I venture to prophesy that this plant will return to popularity as soon as stocks are available. The flower is quite distinct. It forms a good sized truss and the individual flowers are frilled in the same way as those of 'John Walter' and 'Purple Splendour.' These reflect the sunlight which greatly adds to the beauty of the plant. The colour may best be described as bright, light red with a hint of salmon. It is a pure colour for an old Rhododendron with no trace of mauve. The nearest modern Hardy Hybrid in colour is 'J. H. Van Nes' which is not often seen in flower as it is bud tender. The only fault in 'Garibaldi' is that the habit of the plant is inclined to be wiry. But even this is not bad enough to condemn a plant with such a beautiful flower and colour.

'Sir James Clarke' has given precedence to 'B. de Bruin.' These two Rhododendrons are much the same in every respect. They are both tall, rather leggy growers. They form loose trusses of red flowers, the foliage is similar and both flower late in the season. Of the two, 'Sir James Clarke' is probably the better being more bushy in habit and finer in colour. It has that brick red shade which is not often seen in Hardy Hybrid

Rhododendrons being more characteristic of *Griersonianum* hybrids. The reason for 'B. de Bruin' being in wider cultivation is probably because of the skill and enthusiasm of our friends in Holland where it was raised.

'The Bride' is a beautiful plant—as the name implies. A pure white flower with a green centre forming a compact truss of fair size. The habit is compact and bushy, the foliage, although small, is glossy and of good colour. It is a hardy plant. One fault must be admitted—as with other *caucasicum* hybrids it is susceptible to the Rhododendron fly. The origin of this plant is most interesting and is described in full in the *R.H.S. Journal* for 1850 by the raisers—MESSRS. STANDISH AND NOBLE. Briefly, it is an inbred form of *caucasicum album*.

I have described a few of the lesser known varieties in detail —some of which can only be regarded as Museum Pieces. There are few examples of many of them still in cultivation. Perhaps the first list of "starred" Rhododendrons from the 1886 catalogue is the most interesting. Most of these plants are over 100 years old and, as may be seen from the stars and countless examples in gardens in all parts of the country, they are as popular now as ever.

# A REVIEW OF RHODODENDRONS IN THEIR SERIES

## III. *The Campanulatum and Fulvum Series*

BY DR. J. MACQUEEN COWAN AND H. H. DAVIDIAN, B.Sc.

IN a review of Rhododendrons in their series, the Campanulatum Series is clearly one which should have priority, because this loosely bound group of purely Himalayan species is acknowledged to be a heterogeneous assemblage. Along with this series we are reviewing the Fulvum Series, a small group of five species confined to Yunnan and the adjoining parts of south-east Tibet and Burma. The species of the two series are closely connected, but it is also true that, in varying degree, they are affiliated to species of other series, particularly the Arboreum, Lacteum and Taliense Series. Thus it follows that, since a close relationship seems to exist between selected species in these several series, all five series must be studied before the inter-relationships are fully understood; but meanwhile we are considering only the two most closely connected series and leaving the arrangement of the species to be decided upon later, making it clear that there is no implied suggestion that the Campanulatum and Fulvum Series should be permanently combined.

It is admitted that the Campanulatum Series as it stands is an artificial rather than a natural association, although it may be argued that the species are best placed together as a matter of convenience. When, however, this plan is adopted it is difficult to find common characteristics sufficiently outstanding to distinguish the group, as can be inferred from the comments upon the series in *The Species of Rhododendron.* In the appropriate introductory paragraphs the series is defined by the rather vague statements that all the species "agree in the general shape, texture and rounded apex of the leaf." and later that, "the leaves in the Series Campanulatum tend to be rounded at both ends"; and that, "this character along with the glabrous ovary keeps them apart from members of the Arboreum Series." If we agree that the species which now comprise the Campanulatum Series are best held together as, "a somewhat heterogeneous assemblage," then we have no alternative but to depend upon the above criteria to distinguish them, because the species have no other common characteristics. And if we accept this view we must also admit that the species within the series are no more closely allied to each other than are some of them to

certain other species now in other series. Then further, recognising that we are dealing with a mixed assemblage, we must note that the characters in which the species of this series disagree are, in point of fact, those which in other instances have been regarded as important enough to be used as criteria in distinguishing one series from another. As we have indicated, the affinity of the Campanulatum Series is divided, the various species of the series being akin in a closer or more distant degree to species in the Arboreum, Fulvum, Lacteum and Taliense Series. Concerning the future status of the series the question to be considered is, whether the Campanulatum Series should be retained in its present form; whether the variation with regard to the truss, the flower colour, the ovary and the indumentum should be admitted within the limits of a single series. It may be proposed on the one hand, that the series be expanded to include species of the Fulvum Series, making it scarcely more heterogeneous than it is at present; on the other hand, evidence can be adduced to support the suggestion that the species of the five above-mentioned series should be re-arranged in some other manner. No matter which plan is ultimately preferred it can be shown to have advantages and disadvantages, and a decision as to the most natural or most convenient arrangement is best postponed until all five series have been carefully examined.

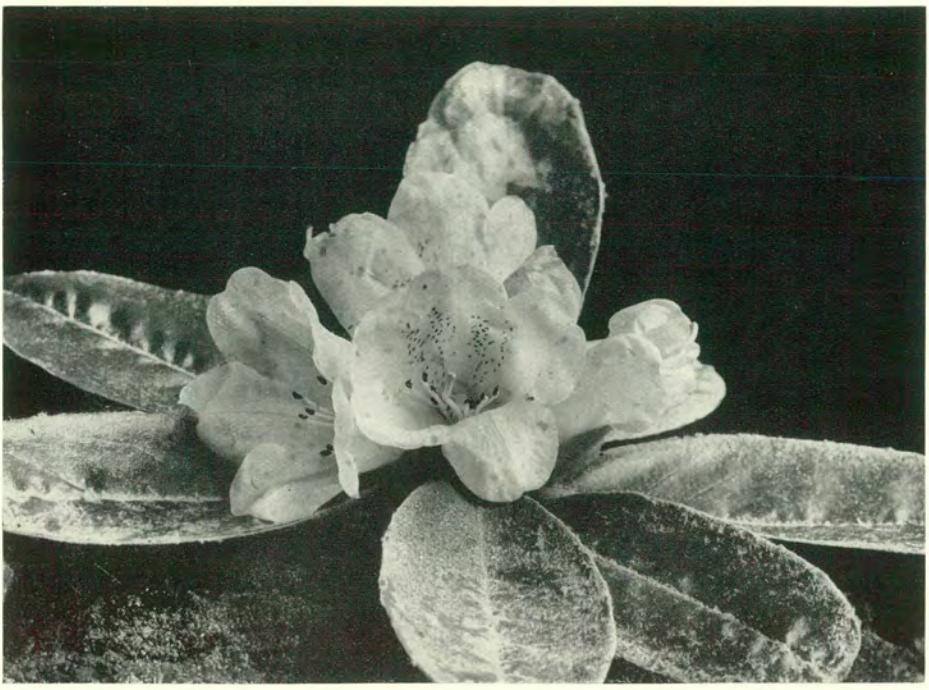
As to the Fulvum Series, this is a small series which presents no great difficulty, but involves some problems of relationship which will be interesting to discuss. Much of what has been said with regard to the Campanulatum Series applies to the Fulvum Series, the two series are closely affiliated, separable by size and shape of leaf, yet otherwise in close harmony. Here, again, we find a certain admixture within the series and an affinity with species of other series, in this instance notably the Arboreum Series; and this must be taken into account before subdivision or amalgamation or any other adjustment of the series is made.

In *The Species of Rhododendron* the distinguishing features of the Fulvum Series are set out in the following terms, "The species of this series are at once distinguished by the narrowly elongate glabrous ovary which develops into a sickle-shaped fruit. The following subordinate characters may be noted: the long narrow oblanceolate or obovate leaves, the open trusses and the long thin pedicels. The indumentum varies. In *R. fulvum* and *R. fulvoides* it is of so peculiar a nature as to be quite distinctive for these two species." Taking the main characters, the sickle-shaped fruits and glabrous ovary, it may be said that these together are on the whole dependable criteria, although the ovary is often minutely puberulous and the capsule is sometimes

THE CAMPANULATUM AND FULVUM SERIES

FIG. 49—*R. campanulatum* in the Benmore Gardens (See pp. 164–166)

FIG. 50—*R. fulgens* (See pp. 169–170)



THE CAMPANULATUM AND FULVUM SERIES

FIG. 51—*R. lanatum* (See pp. 170–171)

not so long and so curved as to be readily recognizable as a sickle-shaped fruit, distinct from the glabrous and sometimes curved fruits of species in the Campanulatum and other series; the fruits of *R. campanulatum* are sometimes long, thin and distinctly curved. But, while there is agreement in the series with regard to the characters just mentioned, looked at from another point of view there is wide divergence. If, for example, due weight is placed upon the significance of the indumentum as a diagnostic criterion, as it has been given say in the Parishii subseries, then the Fulvum Series must be regarded as an admixture of species. *R. fulvum* with *R. fulvoides* is unique among Rhododendrons in the structure of its indumentum; and, as to indumentum, widely separated even from other species of the Fulvum Series.

In summing up these introductory remarks, the most important point to notice is that the two series—the Campanulatum and the Fulvum Series—consist of several linked but distinctive groups of species, scarcely more closely allied to each other than they are to other groups of species in other series. The relationships are indicated in the following account of the main characteristics of the species, and it will cause no confusion and avoid repetition if we take the two series together.

HABIT. The species of both series are medium to large shrubs or small trees up to about 30 feet high, but smaller forms of most species are recorded.

BRANCHLETS. In the Campanulatum Series *R. Sherriffii* is unique in its glandular (as well as hairy) branchlets. The densely tomentose branchlets are a diagnostic characteristic of *R. lanatum* and *R. tsariense*; in *R. campanulatum* and *R. fulgens* the branchlets are usually glabrous; in other species they are more or less floccose. In the Fulvum Series the branchlets of all species are clothed with a short, usually dense tomentum.

LEAVES. The size and shape of the leaf, though variable, is a character of importance in distinguishing between members of the two series. The indumentum and its structure is a criterion useful diagnostically for various species or groups of species in both series. The leaves of species of the Campanulatum Series are, generally speaking, rounded, elliptic-obovate to obovate, sometimes elliptic, sometimes oval; and usually rounded or obtuse, both at the apex and at the base. Those of the Fulvum Series are oblanceolate or obovate, sometimes oblong-obovate, obtuse or sharply acuminate at the apex; narrowed to the base or obtuse. The under sides of the leaves in both series are usually covered with a thick or thin continuous wool, often of a rusty brown colour. The indumentum sometimes consists of

scattered tufts of hairs; sometimes the tufts are sparse or almost absent as in certain forms of *R. campanulatum*, *R. Wallichii* and *R. fulgens*. Mop-like hairs are the unique feature of *R. fulvum* and *R. fulvoides*. Then, *R. fulgens*, *R. Wallichii* and *R. Sherriffii* all have distinctive types of hair differing in this respect from other species in the series.

The petiole is characteristically woolly in *R. lanatum* and *R. tsariense*, glabrous in *R. fulgens* and *R. Sherriffii*, variable in other species of the Campanulatum Series; usually sparsely to densely tomentose and with a short tomentum in species of the Fulvum Series.

INFLORESCENCE. The inflorescence is a loose, racemose umbel usually 5–12-flowered in the Campanulatum Series, but 2–6-flowered in *R. Sherriffii*, *R. miniatum*, and *R. tsariense*; and 6–18-flowered in the Fulvum Series. Unlike other species *R. fulgens* is an exception in which the truss is compact as in *R. arboreum*.

The densely tomentose rachis and pedicels are characteristic of *R. lanatum* and *R. tsariense*; in *R. miniatum* the rachis is moderately, never densely, tomentose; it is glabrous in other species of the series except *R. Wallichii* in which, as in species of the Fulvum Series, the rachis is either glabrous or more or less tomentose.

CALYX. A small or minute calyx is a common feature of species in both series. The only noteworthy exception is *R. miniatum* in which the calyx is sometimes as much as 1·4 cm. long, a useful diagnostic feature.

COROLLA. The shape of the corolla is fairly uniform, campanulate or more usually funnel-campanulate in both series, with a single exception, *R. fulgens*, in which the corolla is tubular-campanulate as in *R. arboreum*. As to flower colour there is considerable variation—the flowers of *R. fulgens*, *R. miniatum* and *R. Sherriffii* are a deep blood-red, of *R. lanatum* usually pale yellow spotted purple, of *R. campanulatum* and *R. Wallichii*, various shades of lilac or rosy-purple, spotted, and of *R. tsariense* white or pink. The flowers of all species of the Fulvum Series are variable, white to rose, with (but sometimes without) crimson spots and a crimson blotch at the base.

STAMENS. In both series the number of stamens is constantly 10, they are unequal in length; the filaments are puberulous at the base, with the following exceptions—*R. fulgens*, *R. miniatum* and *R. Sherriffii* in which they are glabrous; *R. campanulatum* is a variable species in this respect.

OVARY. In the Campanulatum Series the ovary varies considerably in shape, oblong-ovoid to oblong or narrowly elongate-

cylindric. The ovary is not constantly glabrous; note particularly *R. lanatum* and *R. tsariense* where the ovary is densely tomentose. Typically the ovary is 5-celled, but it is 8-celled in *R. fulgens*, 5–8-celled in *R. campanulatum* and 5–6-celled in *R. Wallichii*.

In the Fulvum Series the ovary is narrowly elongate-cylindric, glabrous or minutely puberulous, and varies from 5- to 10-celled.

CAPSULE. In shape and size the fruit, in species of the Campanulatum Series, is variable, broad and stout, oblong-cylindric or narrowly elongate-cylindric; 1·3–3·8 cm. long, 3–8 mm. broad; straight or occasionally slightly or moderately curved. Except in *R. lanatum* and *R. tsariense*, where the capsule is fawn or rusty tomentose, it is glabrous or sometimes with a few hairs.

In all species of the Fulvum Series the capsule is narrowly elongate-cylindric; 2–5 cm. long, 3–6 mm. broad; slightly or moderately curved; glabrous or minutely puberulous.

KEY TO THE SPECIES

A. Leaves rounded, widest at the middle, obtuse at the base; capsule broad and stout, or elongate-cylindric, slightly or moderately curved.
  B. Ovary glabrous; branchlets, petiole and pedicel glabrous (sometimes more or less hairy).
    C. Flowers lilac or pale lilac to rosy-purple.
      D. Indumentum on lower surface of leaf usually continuous, suede-like or smooth, rarely patchy or absent, composed of branched (ramiform) hairs . . . *R. campanulatum*
      D. Indumentum on lower surface of leaf discontinuous, of scattered tufts, composed of sheaf-like (fasciculate) hairs . . *R. Wallichii*
    C. Flowers deep blood red.
      D. Inflorescence compact, 8–14-flowered, indumentum (continuous, woolly, rarely sparse or absent) composed of sheaf-like (fasciculate) hairs . . . . *R. fulgens*
      D. Inflorescence lax, 2–6-flowered, indumentum not composed of fasciculate hairs
        E. Branchlets eglandular, calyx often up to 1·4 cm. long, corolla 2·8–3 cm. long, branches of hairs long and narrow . . . . . *R. miniatum*
        E. Branchlets glandular, calyx 3–5 mm. long, corolla 3·5–4 cm. long, branches of hairs short and broad . . . *R. Sherriffii*
  B. Ovary densely tomentose; branchlets, petiole and pedicel densely tomentose.
    C. Flowers sulphur-yellow, leaves 6–12 cm. long *R. lanatum*
    C. Flowers white or pink, leaves 2·2–6·2 cm. long *R. tsariense*

A. Leaves oblanceolate to obovate, widest above the middle, usually narrowed to the base; capsule narrowly elongate-cylindric, slightly or moderately curved (sickle-shaped).

B. Indumentum on the lower surface of the leaves brown or tawny, more or less granular, composed of mop-like (capitellate) hairs . . . *R. fulvum*

B. Indumentum on the lower surface of the leaves whitish or fawn, not granular, smooth, more or less woolly, composed of tree-like (dendroid) hairs . . . . . *R. uvarifolium*

DESCRIPTION OF SPECIES (AMP. ET EM.)

**R. campanulatum** D. Don in Mem. Wern. Soc., III, 410 (1821), and in Prod. Fl. Nep., 153 (1825); Wall. Cat., 756 (1828); Lodd. Bot. Cab., XX, t. 1944 (1833); Don's Gard. Dict., III, 844 (1834); Sweet, Brit. Fl. Gard., III, t. 241 (1835); Florists Mag., I, 83 (1836); D. C. Prod., VII, 721 (1838); J. C. Loudon, Arb. & Frut. Brit., II, 1147 (1838); Loud. Arb. Brit., 589, t. 1114; Hort. Univ., I, 255 (1839); Bot. Mag., LXVI, t. 3759 (1840); Gard. Chron., 749 (1844); Fl. des Serres, V, 477–480 (1849); Hook. f. in Journ. Hort. Soc., VII, 78, 100 (1852); Brand. For. Fl., 281 (1874); Clarke in Hook. f. Fl. Brit. Ind., III, 466 (1882); Gard. Chron., XI, 695 (1892); ibid., XV, 570 (1894); ibid., LXXI, 300 (1922); Garden, XLVIII, 104, 108 (1895); ibid., LIX, 294 (1901); Journ. Hort., Ser. 3, LVIII, 556 (1909); Schn. Ill. Handb. Laubh., II, 491, 493 (1909); Millais, Rhododendrons, 133 (1917), and ibid., Ser. 2, 99 (1924); Basu, Ind. Med. Pl., t. 571 (1918); Tagg in The Sp. of Rhod., 177 (1930); Notes R.B.G. Edin., XIX, 228 (1937); Kew Bull. Misc. Inf., No. 2, 96 (1939); Bean, Trees & Shrubs, II, 347 (1914); Rhod. Handbook, 14 (1947).

HABIT: a shrub, 60 cm.–5·50 m. high; branchlets glabrous or sometimes hairy, those below the inflorescences 5–7 mm. in diameter.

LEAVES: lamina leathery, elliptic or obovate or oval or oblong-elliptic, 5–15·8 cm. long, 2·4–7·8 cm. broad; apex obtuse; base obtuse or rounded or semicordate; upper surface smooth, more or less glossy, glabrous at maturity, midrib grooved, primary veins 12–16 on each side, impressed; under surface clad with a thin or thick, felted or woolly, fawn to rusty-brown indumentum forming a continuous covering, or sometimes with numerous separate tufts of hairs, rarely glabrous, midrib prominent, hairy or glabrous, primary veins obscured; petiole 0·8–3·4 cm. long, glabrous or hairy.

INFLORESCENCE: a racemose umbel of 6–12 flowers; rachis 0·6–3·4 cm. long, glabrous or hairy.

PEDICELS: 0·9–3·6 cm. long, glabrous or hairy.

CALYX: minute, 5-lobed, 0·5–2 mm. long, lobes rounded or pointed, glabrous outside, margin ciliate or eciliate.

COROLLA: broadly campanulate, 2·8–4·5 cm. long, white, rosy-white and various shades of rosy-purple, more or less purple spotted within on the upper side, glabrous or sometimes hairy at the base outside; lobes 5, rounded, 1·2–2 cm. long, 1·7–2·8 cm. broad, notched.

STAMENS: 10, unequal, 1–4 cm. long; filaments puberulous at base or sometimes glabrous.

PISTIL: 2·1–4·7 cm. long; ovary elongate-cylindric, 5–7 mm. long, glabrous or rarely with a few hairs, 5–8-celled; style glabrous, stigma lobulate.

CAPSULE: narrowly elongate-cylindric, 1·4–3·8 cm. long, 5–7 mm. broad, slightly or moderately curved, glabrous or rarely with a few hairs.

HABITAT:

*N.W. Himalaya.* Wall. Cat. 756, T. ANDERSON in 1857. CLEGHORN in 1896. BISKAM 2278. G. S. HART 78. J. H. LACE 320, 911, 1570. C. E. PARKINSON 3975. G. WATT 958, 3331, 8640, 9969, 13575. J. R. DRUMMOND 2761, 22498, 22707, 22759, 25254. COOPER 5736, 5737, 5926.

*Nepal.* LAL DWOJ 172.

*N.E. Himalaya.* J. D. H. no number, no date. RIBU AND RHOMOO 15/6/12. CAVE 6719, 6726, 6727, 6918, 6926, 6933, 30/5/13, 29/5/14, 15/5/15. G. WATT 5245, 5291, 5292, 5295, 5296, 5374. COOPER 155. W. W. SMITH 3272.

*Bhutan.* COOPER 1960, 2217, 2592, 3480, 3498, 3527, 3528, 3906, 4102, 4286. LUDLOW AND SHERRIFF 3087. Alt. 9,000–14,000 ft.

The well-known *R. campanulatum* (Fig. 49), which is one of the commonest plants of Rhododendron forest in the Himalayas, is also one of the most widely distributed, for it spreads from Kashmir to Bhutan. Among Indian Rhododendrons it is one of the earliest to be known, for WALLICH sent home seed in 1825. It is a species variable in size and shape of leaf, and particularly with regard to the indumentum on the under surface of leaf—the indumentum may be thick, a continuous felt over the whole surface, or patchy or scurfy or indeed absent; variation is evident also as to the shape, size and the colour of the flower. Numerous

variant forms occur not only in cultivation but also in the wild, and, moreover, in cultivation *R. campanulatum* hybridises freely. In the past some of these forms have been given specific or varietal names and it would appear that, in some instances, this status has been given to plants which are presumably hybrids. In considering *R. campanulatum*, we are concerned with a number of those names, which may be regarded as applicable to *R. campanulatum* in the wider sense; in alphabetical order they are as follows: *R. aeruginosum*, *R. Batemanii*, *R. campanulatum* var. *Campbellii*, *R. Edgari*, *R. nobile*, *R. planifolium* and *R. Wallichii*, and we comment upon them in turn.

*R. aeruginosum*: The name *R. aeruginosum* was given by HOOKER to a plant which he collected in Sikkim at an altitude of 15,000 ft. and which he described and figured as a species in *The Rhododendrons of Sikkim-Himalaya*, in 1849. Three years later, when he wrote his account of *The Climate and Vegetation of East Nepal and the Sikkim Himalaya* he had come to the conclusion that this species did not differ from *R. campanulatum* and in this work the name now appears as a synonym. Again, in his herbarium the plant is named in his own hand-writing *R. campanulatum* var. *aeruginosum*. In *The Flora of British India* the full synonymy with *R. campanulatum* is retained, while in *The Species of Rhododendron*, *R. aeruginosum* is listed as a separate species. The correct status of this plant is a matter of opinion. Between *R. campanulatum* and *R. aeruginosum* there is one, but only one significant difference, viz.: young foliage with metallic lustre, unfolding leaves quite glabrous above—*R. aeruginosum*: no metallic lustre on leaves, unfolding leaves loosely tomentose above—*R. campanulatum*. It is our opinion that *R. aerugin osum* on this one character does not merit more than varietal status.

*R. Batemanii*: The name was published in 1863 by SIR JOSEPH HOOKER in the *Botanical Magazine* (t. 5387) describing a plant which had been raised by MR. J. BATEMAN and presented to Kew. Regarding the differences between *R. campanulatum* and *R. Batemanii* nothing need be added to HOOKER'S note. "As a species it resembles *R. campanulatum* in certain respects, attaining about the same stature, and having the leaves clothed below with similar ochreous tomentum; but the whole habit is far more robust, the foliage larger, and much longer and narrower, the stout branches tomentose; the flowers are of a very different colour and it further differs essentially in the ten-celled ovary."

When describing this plant, HOOKER presumed that it had been raised from seed sent home by BOOTH from Bhutan. Subsequent writers, with whom we agree, have pointed out that in

its characters *R. Batemanii* is intermediate between *R. campanulatum* and *R. arboreum*. It has been further suggested that the plant is a hybrid and that it is probably a natural cross between the two above species. In later literature the name *R. Batemanii* appears with varying status; in *The Flora of British India*, as a synonym of *R. campanulatum* var. *Wallichii*, and in *The Species of Rhododendron* as a synonym of *R. campanulatum*.

In the absence of definite evidence as to the origin of this plant we can come to no final conclusion. We have seen the plant at Castle Kennedy to which MILLAIS refers and specimens in our herbarium confirm that *R. Batemanii* is intermediate between *R. campanulatum* and *R. arboreum*. Whilst there is perhaps a strong presumption that *R. Batemanii* was raised from seed sent from Bhutan, it must be pointed out that there is no conclusive evidence to this effect. It will be agreed that mistakes often occur in garden labelling, and if *R. Batemanii* is in fact a natural cross, it is strange that neither CAVE nor WARD nor COOPER nor LUDLOW AND SHERRIFF came across the plant again in Bhutan or adjoining territory where the two plants are most abundant. Further, we may remark that there is no direct evidence to prove that the plant which appeared in MR. BATEMAN'S garden is not a spontaneous garden hybrid. What conclusion should be drawn from the existing evidence? We may state that there is support for the view that the plant is a hybrid. With regard to its origin, we can only say that this is uncertain. In the absence of definite information clearly we ought not to assume that *R. Batemanii* is a Himalayan species or a variety of one of the Himalayan species.

*R. campanulatum* var. *Campbellii:* This plant, which MILLAIS describes, closely resembles *R. Batemanii*, particularly in the shape of the leaves; and in general appearance, like *R. Batemanii*, it would appear to be intermediate between *R. campanulatum* and *R. arboreum*. Certain specimens differ from *R. campanulatum* and *R. Batemanii* in that the flower stalks and the margin of the calyx are glandular. Again nothing is known of the origin of this plant. Suggestions have been made that it too may have been introduced by BOOTH from Bhutan, that it may have been raised from seed sent by COLONEL SYKES about 1840, that it may be a natural hybrid; and moreover that it may be a cross raised in cultivation. All that is definitely known is the fact that it has for long been a garden plant. We are probably safe in assuming this plant also to be a hybrid.

*R. Edgari:* This is a name of no standing, which appears in GAMBLE'S *Darjeeling List*, and in *The Flora of British India* under *R. campanulatum* in synonymy.

*R. nobile:* The name *R. nobile* appeared in WALLICH's catalogue (No. 1521) and the corresponding sheet in his herbarium has specimens of two different plants mounted upon it, the one said to be from Kumaon, the other is *R. nilagiricum* from southern India. WALLICH's name, however, has never been associated with a description nor validly published. But the name *R. nobile* has also been applied to plants in cultivation, notably to a plant at Castle Kennedy in Wigtonshire. This plant has no connection with WALLICH's specimens and how the name came to be applied to the Lochinch plant "is something of a mystery." Once more the plant in cultivation has intermediate features which suggest that it may be a hybrid between *R. campanulatum* and *R. arboreum*. The petiole, pedicel, calyx, ovary and style are sometimes glandular. Again the origin of this plant is unknown and we have little hesitation in assuming it to be a hybrid.

*R. planifolium:* This name was published by NUTTALL in 1853 in HOOKER's *Journal of Botany*, and in *The Flora of British India* it is quoted in synonymy under *R. campanulatum* var. *Wallichii*.

*R. Wallichii:* Although this species has sometimes been regarded as a variety of *R. campanulatum*, there is good reason for regarding it as distinct, as is explained in the comments which later follow the description.

To sum up, *R. campanulatum* is a variable species; we recognise one distinctive variety var. *aeruginosum*; *R. Wallichii* we regard as a separate species. Both *R. campanulatum* and *R. arboreum* have been long in cultivation and they hybridise freely. We suspect that plants supposed to have been raised from seed collected in the wild are in fact early garden hybrids of the two species; *R. Batemanii*, *R. campanulatum* var. *Campbellii* and *R. nobile* have the characteristics, and suggest the range of variation, that would be expected from such a cross; admittedly we have no definite evidence of their hybrid origin, but there is also no evidence to support a contrary view.

**R. campanulatum** D. Don **var. aeruginosum** Hook. f. MS.

*R. aeruginosum* Hook. f. in Rhod. Sikk. Himal., 23, t. 22 (1849); Millais, Rhododendrons, 111 (1917), and ibid., 77, Ser. 2 (1924); Tagg in The Sp. of Rhod., 176 (1930); Rhod. Handb., 3 (1947).

HABITAT: *Sikkim.* J. D. H. no number, no date. Alt. 13,000–14,000 ft.

As is pointed out above, the variety differs from the species in that the young foliage of the variety has a metallic lustre. The unfolding leaves are quite glabrous above.

**R. fulgens** Hook. f. in Rhod. Sikk. Himal., 27, t. 25 (1849), and in Journ. Hort. Soc., VII, 79, 100 (1852); Fl. des Serres, VIII, 109, t. 789 (1852–3); Bot. Mag., LXXXVIII, t. 5317 (1862); Clarke in Hook. f. Fl. Brit. Ind., III, 466 (1882); Schn. Ill. Handb. Laubh., II, 491, 493 (1909); Bean, Trees & Shrubs, II, 357 (1914); Millais, Rhododendrons, 172 (1917), and ibid., Ser. 2, 145 (1924); Tagg in The Sp. of Rhod., 178 (1930); Rhod. Handb., 39 (1947).

HABIT: a shrub, 60 cm.–3 m. high; branchlets glabrous, those below the inflorescences 5–7 mm. in diameter.

LEAVES: lamina leathery, broadly obovate or oval or oblong-obovate or obovate-elliptic, 5·3–12·4 cm. long, 2·4–7 cm. broad; apex rounded or obtuse; base rounded or obtuse or slightly cordate; upper surface more or less glossy, glabrous, midrib grooved, glabrous, primary veins 12–14 on each side, impressed; under surface clad with thick, dense, brown or tawny, woolly indumentum forming a continuous covering, or sometimes with numerous separate hair tufts with large bare areas, or sometimes glabrous; midrib prominent, glabrous, rarely covered with hairs, primary veins covered with hairs or bare; petiole 0·3–2·8 cm. long, glabrous, more or less glossy.

INFLORESCENCE: a *compact rounded truss* of 8–14 flowers; rachis 0·8–2·4 cm. long, glabrous.

PEDICELS: 0·4–1·5 cm. long, crimson tinted, glabrous.

CALYX: small, 5-lobed, 1–3 mm. long, lobes rounded, crimson tinted, glabrous.

COROLLA: *tubular-campanulate*, fleshy, 2–3·3 cm. long, 2·6–4·5 cm. across, *deep blood-red* without spots, with 5 black-red nectaries in the 5 basal pouches; lobes 5, rounded, 0·8–1·5 cm. long, 1–1·8 cm. broad, notched.

STAMENS: 10, unequal, 0·6–2·2 cm. long; filaments glabrous, white, or pink tinted at base; anthers chocolate brown.

PISTIL: 1·2–2·2 cm. long; ovary conoid or elongate-cylindric, 4–5 mm. long, furrowed, glabrous, 8-celled; style glabrous, longer than the stamens or shorter than some, pinkish; stigma small, black, truncate.

CAPSULE: narrowly elongate-cylindric or oblong, stout, 1·3–3 cm. long, 4–8 mm. broad, slightly curved, glabrous, purplish-glaucous.

HABITAT:

*Sikkim.* J.D.H. No number, no date. T. THOMSON in 1857. G. H. CAVE 28/5/17, 6919, 6920. G. WATT 5271.

*Bhutan.* COOPER 3905, 4101. LUDLOW AND SHERRIFF 3075, 3090, 3239.

*Assam.* WARD 11587.
*Tibet.* LUDLOW AND SHERRIFF 1297.
Alt. 11,000–14,000 ft.

The well-known *R. fulgens* has a wide distribution in the Himalayas, from Nepal to Bhutan, at elevations of 10,000–14,000 ft. A fine figure was published in the *Botanical Magazine* in 1862 (t. 5317) drawn from a plant that had flowered at Kew twelve years after its introduction by SIR J. D. HOOKER. When exhibited by SIR EDMUND LODER in March 1933, it was given an Award of Merit. Although linked with *R. campanulatum*, which it resembles in habit of growth, shape of leaf and glabrous ovary, *R. fulgens* shows a close similarity to its associates *R. arboreum* and *R. barbatum*, in colour and shape of flower, and in its compact truss. As to the indumentum on the under side of the leaf, this is usually a continuous, brown or tawny tomentum closely resembling the indumentum of the leaves of *R. campanulatum*; but in structure the hairs which compose the indumentum are matched only by those of a number of species in other series. In spite of these striking differences, however, it cannot be denied that *R. fulgens* and *R. campanulatum* are closely akin. The only species likely to be confused with *R. fulgens* is *R. miniatum*, which has, however, a loose truss with few flowers, a large calyx and floccose branchlets. (Fig. 50.)

**R. lanatum** Hook. f. in Rhod. Sikk. Himal., 17, t. 16 (1849), and in Journ. Hort. Soc., VII, 79, 100 (1852); W. Thompson, Engl. Fl. Gard., I, 113 (1852); Rev. Hort., IV, 161 t. 9 (1855); Floricult. Cat., XXI, 49 (1853); Fl. des Serres, VII, 109, t. 684 (1851–2); Horticulteur France, t. 7 (1858); Clarke in Fl. Brit. Ind., III, 467 (1882); Schn. Ill. Handb. Laubh., II, 487, 490 (1909); Millais, Rhododendrons, 200 (1917), and ibid., Ser. 2, 169 (1924); Bean, Trees & Shrubs, III, 390 (1933); Notes R.B.G. Edin., XIX, 228 (1937); Tagg in The Sp. of Rhod., 179 (1930); Rhod. Handb., 52 (1947).

HABIT: a shrub or tree, 30 cm.–3 m. high; branchlets *densely tomentose* with white, tawny or brown cottony *tomentum*, those below the inflorescences 3–7 mm. in diameter.

LEAVES: lamina leathery, elliptic or obovate or oblong-obovate, 6–12 cm. long, 1·8–5 cm. broad; apex obtuse or rounded or sometimes shortly acuminate; base obtuse or narrowed; upper surface glabrous, midrib grooved, more or less woolly, primary veins 8–15 on each side, impressed; under surface including the midrib and primary veins clad with a thick dense, brown or white to rust-coloured woolly

indumentum forming a continuous covering; petiole 0·5–2·6 cm. long, *densely woolly.*

INFLORESCENCE: a racemose umbel of 5–10 flowers; *rachis* 0·3–1 cm. long, *tomentose.*

PEDICELS: 0·9–2 cm. long, *densely covered with* a whitish to brown cottony *tomentum.*

CALYX: minute, 5-lobed, 0·5–2 mm. long, lobes rounded or acute, glabrous to densely hairy outside.

COROLLA: broadly campanulate, 3·2–4·8 cm. long, *pale sulphur-yellow, sprinkled inside at back with red spots*; lobes 5, 1·2–1·8 cm. long, 1·2–2·4 cm. broad, rounded.

STAMENS: 10, unequal, 1·5–3·5 cm. long; filaments hairy at base; anthers dark brown.

PISTIL: 2·4–4·2 cm. long; *ovary* oblong-ovoid or oblong, 4–6 mm. long, furrowed, *densely tomentose*, 5-celled; style glabrous, stigma lobulate.

CAPSULE: 1·5–2·5 cm. long, 4–8 mm. broad, elongate-cylindric, slightly or moderately curved, *with* fawn or rusty *tomentum.*

HABITAT:

*East Himalaya.* J. D. HOOKER no number, no date. G. WATT 5294, 5490, 5616, 5730. RIBU AND RHOMOO 15/6/12, 15/4/14. CAVE 29/5/17, 29/5/14, 12/2/23, 746, 751, 6723, 10/12/17. W. W. SMITH 3268.

*Bhutan.* COOPER 2148, 3484, 3490, 3874, 3987, 3990. LUDLOW AND SHERRIFF 3063, 3074, 3089.

*Assam.* WARD 8288, 11580.

Alt. 12,000–14,000 ft.

This plant of the Sikkim Himalaya was first found by HOOKER in 1851 on the rocky spurs of mountains and gullies at 10,000–12,000 feet. It was introduced into cultivation the same year. Subsequently it has been collected in Bhutan, Assam and Tibet. It is not very common in cultivation and is shy to flower, but well grown plants may occasionally be seen in gardens; there are several in the Royal Botanic Garden, Edinburgh. (Fig. 51.)

From members of the Campanulatum Series, except *R. tsariense*, *R. lanatum* differs markedly in its densely tomentose ovary; the branchlets, petiole, pedicel and capsule are usually densely woolly. From the closely allied species *R. tsariense*, it differs in the colour of the flowers and in the size of the leaves.

**R. lanatum** Hook f. **var. luciferum** Cowan in Notes R.B.G. Edin., XIX, 228 (1937); Rhod. Handb., 52 (1947).

HABITAT: *Tibet.* LUDLOW AND SHERRIFF 1762—type, 1389, 1557, 1558, 1608, 1610.

The variety differs from the species in its larger, more pointed leaves. The Tibetans use the wool from the under sides of the leaves as wicks for their lamps.

**R. miniatum** Cowan in Notes R.B.G. Edin., XIX, 229 (1937); Rhod. Handb., 62 (1947).

HABIT: a shrub, 1·50–4·60 m. high; branchlets floccose, those below the inflorescences 3 mm. in diameter.

LEAVES: lamina elliptic, obovate or oblong, 3·3–5·5 cm. long, 1·5–3 cm. broad; apex obtuse or rounded, mucronate; base cordulate or rounded; upper surface glabrous, opaque, midrib grooved, more or less hairy, primary veins 6–10 on each side, impressed; under surface clad with a thick, woolly, fawn indumentum forming a continuous covering, midrib prominent, glabrescent, or obscured; petiole 6–9 mm. long, tomentose or glabrescent.

INFLORESCENCE: shortly racemose, 4–6-flowered; rachis about 5 mm. long, tomentose.

PEDICELS: 5–6 mm. long, glabrous or sparsely hairy.

CALYX: large, 5-lobed, unequal, *up to* 1·4 *cm. long*, fleshy, crimson, glabrous.

COROLLA: funnel-campanulate, 2·8–3 cm. long, fleshy, *deep crimson*; lobes 5, 1–1·2 cm. long, 1·2–1·6 cm. broad, notched.

STAMENS: 10, unequal, 1·2–5 cm. long; filaments glabrous, anthers dark brown.

PISTIL: 2·8–3 cm. long; ovary narrowly elongate-cylindric or oblong, 4–5 mm. long, furrowed, glabrous, 5-celled; style glabrous, rose or white.

CAPSULE: narrowly elongate-cylindric, 1·4 cm. long, 3 mm. broad, straight, grooved, glabrous.

HABITAT: *Tibet.* LUDLOW AND SHERRIFF 1710—type, 1627.

*R. miniatum* was discovered by LUDLOW AND SHERRIFF in 1936 in S. Tibet, growing in Rhododendron and Fir forest and beside cliffs on the edge of Rhododendron zone. It has not yet appeared in cultivation but it would make an attractive garden plant.

It is allied to *R. fulgens* but is distinguished by the large calyx, up to 1·4 cm. long, the few-flowered lax truss, and the floccose branchlets. Both species have deep crimson flowers and are easily distinguished from their allies.

**R. Sherriffii** Cowan in Notes R.B.G. Edin., XIX, 231 (1937); Rhod. Handb., 88 (1947).

HABIT: a shrub or tree, 1·80—6·10 m. high; branchlets hairy,

*glandular*, about 3 mm. in diameter below the inflorescences.

LEAVES: lamina oval or obovate or oblong-elliptic, 4·5–6 cm. long, 2·5–4 cm. broad; apex rounded or obtuse; base rounded or obtuse; upper surface glabrous at maturity, midrib grooved, primary veins 7–10 on each side, impressed; under surface clad with a thick, brown, continuous indumentum, midrib raised, glabrescent or obscured; petiole 1·2–1·5 cm. long, glabrous.

INFLORESCENCE: a short raceme of 4–6 flowers; rachis about 4 mm. long, glabrous.

PEDICELS: 1–2 cm. long, glabrous.

CALYX: 5-lobed, unequal, 3–5 mm. long, carmine, with a thin glaucous bloom, lobes rounded, glabrous.

COROLLA: funnel-campanulate, fleshy, 3·5–4 cm. long, rich *deep carmine* with small deep magenta patches at the base of each petal; lobes 5, 0·6–1·4 cm. long, 1·4–1·6 cm. broad, notched.

STAMENS: 10, unequal, 2·2–3 cm. long; filaments glabrous.

PISTIL: 3·6–4·3 cm. long; ovary oblong-conoid, about 5 mm. long, furrowed, glabrous, 5-celled; style glabrous, carmine, stigma lobulate.

CAPSULE: 1·3 cm. long, 7 mm. broad, straight.

HABITAT: *Tibet.* LUDLOW AND SHERRIFF 1390—type, 2751. Alt. 12,500 feet.

LUDLOW AND SHERRIFF collected this plant in 1936 in S. Tibet at elevations of 11,500–12,500 feet, growing in Rhododendron forest above the Bamboo zone, and on steep hillsides near the edge of the Fir and Larch zone. The species was described in the Notes from the Royal Botanic Garden, 1937, and named after CAPTAIN SHERRIFF. Seed was obtained and distributed. It is a remarkable plant not only for the beauty of its flowers but also for its unusual characteristics, and it is with great interest we are looking forward to seeing it as an established plant in cultivation.

*R. Sherriffii* is so distinctive that it does not fit well into any recognised series, and it was tentatively placed in the Campanulatum Series near *R. fulgens*, which also has a glabrous ovary, thick indumentum and dark carmine flowers. However, *R. Sherriffii* widely deviates from the Campanulatum Series in its glandular branchlets and in the structure of its indumental hairs. The latter character suggests a relationship with the Lacteum Series, and yet our plant is by no means typical of that series. In leaf shape it agrees with species of the Thomsonii Series, but stands wide apart because of the thick indumentum

of the leaf under surface. For the present it may best be retained in the variable Campanulatum Series.

**R. tsariense** Cowan in Notes R.B.G. Edin., XIX, 232 (1937); Rhod. Handb., 98 (1947).

HABIT: a shrub, 60 cm.–3·6 m. high; branchlets about 3 mm. in diameter below the inflorescences, *densely tomentose* with white or tawny or brown tomentum.

LEAVES: lamina leathery, obovate or elliptic-obovate, 2·2–6·2 cm. long, 1–3 cm. broad; apex obtuse or rounded, or shortly acuminate; base obtuse; upper surface glabrous, midrib grooved, more or less woolly, primary veins 8–10 on each side, impressed; under surface including the midrib clad with a dense fawn or rust-coloured woolly indumentum forming a continuous covering; petiole 0·5–1·1 cm. long, *densely woolly.*

INFLORESCENCE: a short raceme of 2–5 flowers; rachis 3–5 mm. long, *densely tomentose.*

PEDICELS: 0·6–1 cm. long, *densely tomentose* with fawn or brown tomentum.

CALYX: minute, 5-lobed, 0·5–1 mm. long, lobes rounded or acute, slightly to densely hairy outside, margin ciliate or eciliate.

COROLLA: campanulate, 2·6–4 cm. long, *pink or white*; lobes 5, 0·9–1·2 cm. long, 1·3–1·6 cm. broad, emarginate.

STAMENS: 10, unequal. 1·1–2·8 cm. long; filaments hairy at base.

PISTIL: 2·7–3·2 cm. long; *ovary* oblong-ovoid or oblong, 4–5 mm. long, *densely tomentose*, 5-celled; style glabrous.

CAPSULE: about 2 cm. long, 5 mm. broad, cylindric, *with* cinnamon-coloured *tomentum.*

HABITAT:

*Tibet.* LUDLOW AND SHERRIFF 1636—type, 1303, 1364, 2210, 2766, 2894.

*E. Bhutan.* LUDLOW AND SHERRIFF 2858.

This plant was collected by LUDLOW AND SHERRIFF in S. Tibet and E. Bhutan in 1936, growing in Rhododendron and mixed forests and on cliff edges, at elevations of 10,500–14,500 feet.

It is akin to *R. lanatum*, but differs in the colour of the flowers and in the size of the leaves.

**R. Wallichii** Hook. f. in Rhod. Sikk. Himal., 4, 5 (1849); Fl. des Serres, V, 477–80 (1849); Tagg in The Sp. of Rhod., 180, 181 (1930); Cowan in Notes R.B.G. Edin., XIX, 233 (1937); Rhod. Handb., 101 (1947). *R. campanulatum* D. Don var. *Wallichii* Hook. f. Bot. Mag., LXXXII, t. 4928

(1856); Brand. For. Fl., 282 (1874); Millais, Rhododendrons, 259 (1917), and ibid., Ser. 2, 259 (1924); Bean, Trees & Shrubs, II, 347 (1914).

HABIT: a shrub, 1·80–3 m. high; branchlets glabrous or floccose, those below the inflorescences 4–6 mm. in diameter.

LEAVES: lamina leathery, elliptic or obovate or oblong, 5·2–12 cm. long, 2·2–5·8 cm. broad, apex obtuse or rounded; base cordate or obtuse; upper surface dark green, smooth, glabrous at maturity, midrib grooved, primary veins 10–15 on each side, impressed; *under surface dotted with numerous or sometimes few powdery* ferruginous or brown *hair tufts which do not form a continuous indumentum*, midrib prominent, primary veins slightly raised; petiole 0·4–2·8 cm. long, glabrous or sometimes tomentose, grooved above, rounded below, often tinged with red.

INFLORESCENCE: a raceme of 5–10 flowers; rachis 0·5–2 cm. long, glabrous or hairy.

PEDICELS: 1–2·5 cm. long, glabrous or hairy.

CALYX: minute, 5-lobed, 0·5–2 mm. long, rarely 3 mm., lobes rounded or triangular, glabrous or hairy outside, margin ciliate or eciliate.

COROLLA: broadly campanulate, 2·5–5 cm. long, lilac or pinkish-mauve more or less dotted with deeper rose-coloured spots, or white; lobes 5, 0·8–1·5 cm. long, 1–2·6 cm. broad, rounded, notched.

STAMENS: 10, unequal, 1–3·6 cm. long; filaments puberulous at base; anthers purple-brown.

PISTIL: 2·3–4 cm. long; ovary narrowly elongate-cylindric, 4–8 mm. long, glabrous, rarely with a few hairs, 5-6-celled; style glabrous, stigma lobulate.

CAPSULE: elongate-cylindric, narrow or stout, 1·5–3 cm. long, 4–7 mm. broad, slightly or moderately curved, glabrous.

HABITAT:

*Nepal.* LAL DWOJ 454.

*Sikkim.* G. WATT 5383. J. H. LACE 2273.

*Bhutan.* COOPER 2147, 2149, 2489, 2503, 3238, 3851, 3492, 4120. LUDLOW AND SHERRIFF 19, 20, 22, 3578.

*Assam.* WARD 11612.

Alt. 10,000–14,000 feet.

*R. Wallichii*, which was discovered by HOOKER in the Sikkim-Himalaya, was described by him in 1849. Later he regarded this species as a variety of *R. campanulatum*. In the *Botanical Magazine*, Vol. LXXXII, 1856, t. 4928, we read, ". . . When Dr. Hooker prepared his description on its native mountain he considered this to be a new species, which he named after our

lamented friend Dr. Wallich, not being then aware of the sportive nature of *Rhododendron campanulatum*, of which he afterwards, and no doubt justly considered it to be a mere variety, with the rusty down of the foliage nearly obsolete." It continues, "In the variety the petioles of the leaves are deeply tinged with red, and the scales of the leaf-bud are also red," and the varietal characters given are, "foliis subtus pilis articulatis ferrugineis sparsim tomentosis v. subglabris, corollis immaculatis."

In *The Flora of British India*, 1882, p. 466, *R. Wallichii* appears as a variety of *R. campanulatum*, and the varietal characters are now said to be "leaves elliptic or oblong, tomentum beneath lax often caducous, petiole densely woolly."

In *The Species of Rhododendron*, 1930 (as in MILLAIS' *Rhododendrons*), *R. Wallichii* is reinstated as a species and the distinguishing characters given in the Key, p. 175, are: "indumentum numerous separate hair tufts—*R. Wallichii*; indumentum a continuous covering—*R. campanulatum*." We find that this distinction is not constant. In *R. campanulatum* the indumentum is variable—thin or thick, fawn to rusty-brown forming a continuous covering or consisting of numerous separate tufts of hairs, or rarely the leaves are glabrous; in *R. Wallichii* the indumentum is thin, ferruginous or brown, with numerous tufts of hairs not continuous or sometimes the hair tufts are few.

When the structure of the hair is examined there is, however, a clear distinction between the two species, in *R. campanulatum* the hairs have a thin flexuous stem with numerous long, narrow thread-like branches; while in *R. Wallichii* they have a stout stem with short, broad branches and usually a characteristic dichotomous branching. Although the two species closely resemble each other, and are scarcely separable by the naked eye when certain forms are compared, yet the difference in the structure of the indumentum is so marked that we consider *R. Wallichii* merits distinctive specific rank. (Fig. 53.)

**R. fulvum** Balf. f. & W. W. Sm. in Notes R.B.G. Edin., X, 110, 132 (1917); Millais, Rhododendrons, Ser. 2, 146 (1924); Hutch. in Bot. Mag., CLXII, t. 9587 (1939–40); Tagg in The Sp. of Rhod., 290 (1930); Rhod. Soc. Notes, III, 93 (1925–31); Bean, Trees & Shrubs, III, 378 (1933); Rhod. Handb., 40 (1947). *R. fulvoides* Balf., f. & Forrest in Notes R.B.G. Edin., XII, 112 (1920); Millais, Rhododendrons, Ser. 2, 145 (1924); Tagg in The Sp. of Rhod., 289 (1930); Bean, Trees & Shrubs, III, 378 (1933); Rhod. Soc. Notes, III, 94 (1925–31); Rhod. Handb. 39 (1947).

THE CAMPANULATUM AND FULVUM SERIES

FIG. 52—*R. fulvum* (See pp. 176–179)

FIG. 53—*R. Wallichii* (See pp. 175–176)

THE CAMPANULATUM AND FULVUM SERIES

FIG. 54—*R. uvarifolium* (See pp. 179–182)

HABIT: a shrub or tree, 90 cm.–7·60 m. high; branchlets 5–8 mm. in diameter below the inflorescences, moderately or densely tomentose with short grey to cinnamon-coloured tomentum.

LEAVES: lamina leathery, oblanceolate or sometimes oblong-lanceolate or obovate; 6–26·5 cm. long, 2–8·6 cm. broad; apex shortly acuminate or obtuse; narrowed to the base or obtuse; upper surface glabrous at maturity, midrib grooved, primary veins 12–21 on each side, grooved; under surface covered with a granular indumentum of *mop-like hairs, yellowish to deep cinnamon*, midrib prominent, hairy or glabrescent, primary veins more or less obscured by the indumentum; petiole 1–2·4 cm. long, moderately or densely tomentose with short tomentum.

INFLORESCENCE: a racemose umbel of 8–15 flowers; rachis 0·6–2·2 cm. long, hairy or glabrous.

PEDICELS: 1–3 cm. long, hairy or glabrous.

CALYX: minute, 1–2 mm. long, 5-lobed, lobes acute or rounded, glabrous.

COROLLA: campanulate or funnel-campanulate, 2·6–4·38 cm. long, white or white flushed rose or pink, or deep rose, with or without crimson blotch at base, spotted or not spotted; lobes 5, sometimes 6, 1–1·6 cm. long, 1–2·4 cm. broad, emarginate.

STAMENS: 10, unequal, 1·1–3·4 cm. long; filaments puberulous at the base.

PISTIL: 2·3–4 cm. long; ovary narrowly elongate-cylindric, 6–9 mm. long, grooved, glabrous or sometimes with a few hairs, 5–10-celled; style glabrous.

CAPSULE: narrowly elongate-cylindric, moderately or slightly curved, 2–3·8 cm. long, 4–6 mm. broad, glabrous.

HABITAT:

*Yunnan.* FORREST 8989—type, 9001, 11842, 11940, 12115, 12967, 13400—type of *R. fulvoides*, 13029, 13556, 13952, 15660, 15777, 16140, 16515, 17426, 17502, 17636, 17671, 17681, 17730, 17854, 17940, 17952, 17965, 18079, 18207, 18267, 18310, 18364, 18369, 18756, 18819, 18828, 23293, 24110, 24124. 24135, 24314, 24623, 25483, 25726, 25727, 25744, 25745, 25936, 25944, 25958, 26039, 26360, 29300, 29303. HANDEL-MAZZETTI 8850. ROCK 7662, 7665, 7998, 8146, 8738, 8760, 8790, 8883, 9119, 9222, 9223, 10931, 11016, 11023, 11034, 11044, 11048, 11351, 16978, 17124, 18339, 25052, 25054, 25102, 25106, 25110, 25124, 25148, 25149, 25151, 25425,

25426, 25431, 25468. MCLAREN C43, D271. YÜ 13909, 19047, 19677.

*Burma.* FORREST 25020, 25076, 26451, 27816, 27819. WARD 1564. FARRER 874.

*Assam.* WARD 8300.

*Tibet.* FORREST 14499, 14988, 15278, 16516, 16720, 16721, 18628, 19192, 20020, 20075, 20363, 20816, 21810, 21814, 21815, 21820, 21896, 21897, 21898, 22768, 22902, 22903, 22917, 22918, 22943. ROCK 10214, 11168, 11225, 22004, 22092, 22097, 22111, 22461, 22596, 22599, 22603, 22909, 23007, 23011, 23027, 23028, 23487, 23488, 23497, 23505, 23508. LUDLOW AND SHERRIFF 1357.

*Szechuan.* FORREST 21589.

Alt. 8,000–14,500 feet.

"The type of the Fulvum Series, *R. fulvum* Balf. f. & W. W. Smith"—we quote from SIR ISAAC BAYLEY BALFOUR'S footnote to his description of *R. fulvoides*—"is a plant of the Shweli-Salween divide . . ." "This new species *R. fulvoides* we must look on as a geographical form of the Fulvum type from the Mekong-Salween divide . . ." "From the Kari Pass on the Mekong-Yangtze divide, FORREST has brought specimens which do not separate from *R. fulvoides*, and on the mountains N.E. of Chungtien close to the Eastern boundary of N.W. Yunnan FORREST found a plant which seems to be also this *R. fulvoides*."

When the descriptions of the two species, *R. fulvum* and *R. fulvoides*, are compared it will be seen that in structure, and in shape of leaf, inflorescence and flower the recorded differences are so insignificant as to be nearly negligible. In *The Species of Rhododendron* it is noted under *R. fulvoides*, "this species is very near indeed to *R. fulvum*." One distinction, however, is given, "the granular leaf indumentum is coarser than that of its ally, often becoming almost scurfy. It is commonly also of a lighter ochraceous tint."

It is often easy, among plants in cultivation, to pick out those one would regard as *R. fulvum*, with a deep cinnamon indumentum, from those one would regard as *R. fulvoides*, with a buff or tawny indumentum. Looking at various plants one may notice a "coarse" or less "coarse" granularness of the indumentum, but it will be seen that this is not correlated with variation in colour. Many plants are intermediate in colour, and in "coarseness"; and it is merely a matter of opinion under which name many specimens are better placed. The structure of the indumentum of *R. fulvum* is unusual; under the microscope the hairs are seen

to have a short stalk surmounted by a head of densely clustered branchlets, they have a characteristic mop-like appearance, which imparts to the indumentum its granularness, which can be observed by the naked eye. In structure the hairs of *R. fulvoides* are identical. Among Rhododendrons it is only in these two species that hairs of this kind are to be found. Since there is no structural difference between the two species, and as to the colour and "coarseness" of the indumentum there are intermediates between the extreme forms, the retention of the two specific names cannot in our opinion be justified. *R. fulvoides* can at best be regarded as a distinctive form, not confined to any particular locality within the whole range of geographical distribution.

*R. fulvum* received an Award of Merit when exhibited by LORD ABERCONWAY in April 1933. (Fig. 52.)

**R. uvarifolium** Diels in Notes R.B.G. Edin., V, 213 (1912); Millais, Rhododendrons, 215, 256 (1917), and ibid., Ser. 2, 189, 255 (1924); Tagg in The Sp. of Rhod., 292 (1930); Bean, Trees & Shrubs, III, 401 (1933); Rhod. Handb., 99 (1947). *R. Monbeigii* Rehd. & Wils. in Pl. Wilsonianae, I, 536 (1913); Millais, Rhododendrons, 215 (1917), and ibid., Ser. 2, 189 (1924). *R. niphargum* Balf. f. & Ward in Notes R.B.G. Edin., X, 125 (1917); Millais, Rhododendrons, Ser. 2, 194 (1924); Tagg in The Sp. of Rhod., 291 (1930); Bean, Trees & Shrubs, III, 400 (1933); Hutch. in Bot. Mag. CLX, t. 9480 (1937); Rhod. Handb., 65 (1947). *R. dendritrichum* Balf. f. & Forrest in Notes R.B.G. Edin., XII, 103 (1920); Millais, Rhododendrons, Ser. 2, 126 (1924); Tagg in The Sp. of Rhod., 288 (1930); Rhod. Handb., 28 (1947).

HABIT: a shrub or tree, 1·20–10·60 m. high; branchlets 5–8 mm. in diameter below the inflorescences, moderately or densely tomentose with short white or grey tomentum.

LEAVES: lamina leathery, oblanceolate or oblong-oblanceolate or obovate, 7–24·5 cm. long, 2·2–7·2 cm. broad; apex shortly acuminate or obtuse, rarely rounded; narrowed to the base or sometimes obtuse; upper surface dark green, semi-rugulose, glabrous at maturity, midrib grooved, primary veins 14–21 on each side, impressed; under surface covered with a thin or thick *white or ash-grey* or sometimes fawn, continuous indumentum, midrib prominent, glabrous or hairy, primary veins raised, glabrescent or hairy; petiole 1–2 cm. long, slightly to densely tomentose, tomentum short, whitish.

INFLORESCENCE: a racemose umbel of 6–18 flowers; rachis 0·6–1·5 cm. long, hairy or sometimes glabrous.

PEDICELS: slender, 1–3·1 cm. long, slightly to moderately hairy.

CALYX: minute, 0·5–1 mm. long, 5-lobed, lobes rounded or triangular, glabrous, rarely hairy.

COROLLA: campanulate or funnel-campanulate, 2·7–4 cm. long, white or white flushed rose or pale rose or pink, with or without crimson blotch at base, spotted crimson on the posterior side or not spotted; lobes 5, 0·7–1·2 cm. long, 1·1–2·3 cm. broad, emarginate.

STAMENS: 10, unequal, 1·3–3·5 cm. long; filaments puberulous at the base.

PISTIL: 2·4–3·5 cm. long; ovary narrowly elongate-cylindric, 5–9 mm. long, grooved, glabrous or minutely puberulous, 5–8-celled; style glabrous.

CAPSULE: narrowly elongate-cylindric, slightly or moderately curved, 2–5 cm. long, 3–4 mm. broad, glabrous or sometimes puberulous.

HABITAT:

*Yunnan.* FORREST 5072—type, 10292, 10639, 10914, 11421, 11738, 12435, 13035, 13923, 13990, 14034, 14751, 14891, 15216, 15358, 15444, 15964, 16366—type of *R. dendritrichum*, 16519, 17096, 17408, 19734, 23107, 23308, 23309, 29306. WARD 324—type of *R. niphargum*. ROCK 3643, 8216, 8218, 8350A. 8360, 8424, 8450, 8714, 8746, 9174, 9775, 11045, 11075, 11386, 11391, 11504, 18281, 18520, 24251, 24254, 24256, 24258, 24604, 24653, 24660, 24865, 25112, 25113, 25114, 25251, 25352, 25419, 25421. MONBEIG 171. WARD 4995, 5033. MCLAREN D18, D42. YÜ 7869, 7924, 10699, 13911, 14952, 15654.

*Szechuan.* FORREST 16267, 20501, 22198. ROCK 17394.

*Tibet.* FORREST 16531, 18613, 18627, 18629, 18915, 21816, 21817, 22762. ROCK 22042, 22096, 22537, 22997, 23517. WARD 5660, 7122.

Alt. 7,000–14,000 feet.

The name *R. uvarifolium* was given by Diels in 1912 to a plant collected by FORREST in 1904, in N.W. Yunnan, in Rhododendron forest at an elevation of 7,000–8,000 feet, on the ascent of the Ninchang Pass from the Yangtze valley to the Chung-Tien plateau.

Another plant collected by Monbeig in Yunnan was described as *R. Monbeigii* by REHDER AND WILSON in 1913, but it exactly matches *R. uvarifolium*, and the name appears in synonymy in *The Species of Rhododendron*.

Then again in 1913, WARD collected a plant (No. 324) at Beima-shan, Yunnan, growing in Fir forests, which was described in 1917 as *R. niphargum*. Its affinity was stated to be with *R. uvarifolium* from which it was said to differ in its broader leaves not obtuse and not acuminate, in the larger pedicels and flowers, and in the corolla which is puberulous inside. Further gatherings—we have now ample material—show that the distinguishing characters are not constant. In *R. uvarifolium* the leaves are narrowly or broadly oblanceolate, and in *R. niphargum* they are narrowly or broadly oblanceolate or oblong-oblanceolate or obovate. In both species the leaf size is very variable and the stated distinctions with regard to the pedicels and flowers do not hold. (Fig. 54.)

Furthermore, in 1920 still another species *R. dendritrichum* was founded on FORREST'S No. 16366, a plant which had been collected on the Mekong-Salween divide in March 1918. There is no diagnosis, nor any affinity indicated in the original description, but in *The Species of Rhododendron* it is listed in the Fulvum series, where its affinity undoubtedly lies. The remark is made that, "This stands by itself in this small series, differing from the other four in the character of its woolly indumentum, while unmistakably in correspondence with them as regards flowers and fruit." There is no doubt that *R. dendritrichum* is very distinct from *R. fulvum* and, though similar in flower and fruit, at first sight it would appear to differ from *R. uvarifolium* and *R. niphargum*. When we look at the type sheet of *R. dendritrichum* we see that the leaves on the under sides are covered with a rather thick, woolly, buff or tawny indumentum (which is, however, easily rubbed off) apparently very different from *R. uvarifolium* and *R. niphargum* where the indumentum is thin, plastered and ash-grey in colour.

Although there is no distinction between the species as far as the leaves and flowers are concerned, there would appear to be a good distinction in the indumentum—thickness and colour, though it was observed that the structure of the undumentum of both is similar. When, however, we examine the indumentum in a large number of gatherings, it is clear that the "thin white felty indumentum" of *R. niphargum* may be very thin almost plastered or, on the contrary, very distinctly felty or indeed woolly. There would still appear to be a distinction as to the colour of the indumentum, but in FORREST'S gathering No. 18629 in which four specimens are mounted on a single sheet, two of these show a buff or tawny indumentum, two an ash-grey indumentum. There are other sheets where the colour of the indumentum is intermediate between the two extremes. There is no

doubt that the plant to which the name *R. dendritrichum* was attached is but a form of the plant well known in gardens under the name *R. niphargum*. It is unfortunate that all plants in cultivation are under this last name, since the prior publication of the name *R. uvarifolium*, according to the International Rules of Nomenclature, brings *R. niphargum* into synonymy.

## LIST OF SPECIES AND SYNONYMS

*aeruginosum* Hook. f. = CAMPANULATUM var. AERUGINOSUM
CAMPANULATUM D. Don
CAMPANULATUM D. Don var. AERUGINOSUM Hook. f. MS.
CAMPANULATUM D. Don var. *Wallichii* Hook. f. = WALLICHII
*dendritrichum* Balf. f. & Forrest = UVARIFOLIUM
*Edgari* Gamble Darjeeling List = CAMPANULATUM
FULGENS Hook. f.
*fulvoides* Balf. f. & Forrest = FULVUM
FULVUM Balf. f. & W. W. Sm.
LANATUM Hook. f.
LANATUM Hook. f. var. LUCIFERUM Cowan
MINIATUM Cowan
*Monbeigii* Rehd. & Wils. = UVARIFOLIUM
*niphargum* Balf. f. & Ward = UVARIFOLIUM
*planifolium* Nutt. = WALLICHII
SHERRIFFII Cowan
TSARIENSE Cowan
UVARIFOLIUM Diels
WALLICHII Hook. f.

NOTE: ? × *R. Batemanii*; ? × *R. campanulatum* var. *Campbellii*; ? × *R. nobile* see *R.* CAMPANULATUM.

# THE RHODODENDRONS OF HONG KONG

By G. A. C. HERKLOTS

IN the Colony of Hong Kong, an area of 391 square miles, there are six species of Rhododendron. One of these only occurs on the Island and to the best of my knowledge has not yet been found in South China. Three grow on a few mountains in the New Territories but not on the Island. These, and the two common species, are also known from South China. All six species have been described and illustrated by the writer in Volume IX of the *Hong Kong Naturalist*, 1938, and in *Food and Flowers*, Number 2, 1948; as these journals are not accessible to many a short description with local notes is given of each below.

## *Rhododendron Simsii* Planchon

This is by far the most abundant of the native species occurring in the valleys of Island and mainland almost as low as sea-level and on the slopes of hills and mountains up to about 3000 feet. It is at its best in the lower valleys and in this it differs markedly from all the other local species. The flowering season extends from January to June, the plants being at their best in April. The young branches and leaves are more or less covered with rusty stiff or silky hairs. The flowers are almost sessile and usually three, sometimes two, are developed from the same scaly bud; the inner scales are very hairy. The colour of the flower varies a little with the habitat; it is usually scarlet, the upper petal with reddish-purple spots and flecks. Thousands of plants imported from Kwangtung are cultivated on Hong Kong Island and many thousands occur wild in the Colony. This species is found in many provinces in China, in the Luchu Archipelago and throughout Japan. Diameter of flower about 2 inches. (Fig. 55.)

## *Rhododendron Farrerae* Tate

This is a mountain species. It is never found at low altitudes and only occurs on bare exposed hillsides and rocky cliffs from several hundred feet above the sea to the extreme summit of the mountains at 3000 feet. It is common on Victoria Peak on the Island and in the New Territories. It is often bare of leaves, or nearly so, at the time of flowering. The young foliage is covered with long rusty hairs but these soon disappear, except perhaps on the petiole, and the leaves thicken and darken, become perfectly smooth and dark green above and develop a network of rusty coloured veins below. The branches are produced characteristically in whorls. The flowers, on short stalks, are developed

singly or in pairs. Their colour varies from a pale to a dark purple-pink. The upper petal is smaller than the others and has crimson flecks or spots. Branches of this species in bud, imported from China, are sold in Hong Kong at the Chinese New Year Fair which is held at the end of February or in early March. These buds open when the branches are stood in water. Diameter of flower less than 2 inches. (Fig. 59.)

### *Rhododendron ovatum* Planchon

In the New Territories this species is very local in its distribution; it is abundant on the northern slopes of the Hunchbacks and on the eastern slopes of Ma on shan, the neighbouring peak, at about 2000 feet; it also grows on Lan Tau peak at 1000 feet and again, more abundantly, above 2000 feet. In China it is widely distributed.

This species is evergreen and the small leaves are green on both sides. The young foliage is particularly attractive being bright red and pink. Shrubs flower freely when only 2 or 3 feet high, but they may grow to 15 feet. In my opinion it is the most beautiful of the Hong Kong species. The first time I saw it was in April 1930 when, from the summit of Grassy Hill, 2139 feet, I looked across Tolo Harbour and noticed five miles away high up on the Hunchbacks conspicuous white patches which appeared like snow. I descended, sailed across in my yacht, and climbed the mountain to find that the white patches were bushes of this Rhododendron literally covered with blossoms. Only one flower develops in each bud. The flower when fully open is quite flat; the upper petal, the largest, is about 1 inch across. The flowers are white with a few, or more, spots of deep crimson-purple on the lower edges of the uppermost petal and on the upper margin of each adjacent petal. Sometimes the spots are heavy and more widely distributed and there may be a zone of pale yellow in the centre of the upper petal. The buds are often faintly tinged with pink, especially of those flowers which when open are heavily spotted. The filaments of the five stamens are white, hairy on the lower half, the anthers are pink or mauve; the style is white and the stigma is pale yellowish-green. The flowers possess a delicate fragrance which, from a mass of blossom, is very pleasing. The flowering season is March and April. Diameter of flower 2 inches or a little more. (Fig. 56).

### *Rhododendron simiarum* Hemsley

In China this species (formerly known as *R. Fordii*) is recorded from the Phoenix Mountain, Swatow in Kwangtung; in Hong Kong it is only known from three mountains in the New


RHODODENDRONS FROM HONG KONG

FIG. 55—*R. Simsii*, from a drawing by G. A. C. Herklots (See p. 183)


FIG. 56—*R. ovatum*, from a drawing by G. A. C. Herklots (See p. 184)


RHODODENDRONS FROM HONG KONG

FIG. 57—*R. simiarum*, from a drawing by G. A. C. Herklots (See pp. 184–185)



RHODODENDRONS FROM HONG KONG

FIG. 58—*R. Westlandii*, from a drawing by G. A. C. Herklots
(See p. 185)

FIG. 59—*R. Farrerae*, from a drawing by G. A. C. Herklots
(See pp. 183–184)


RHODODENDRONS FROM HONG KONG

FIG. 60—*R. Championae*, from a drawing by G. A. C. Herklots (See pp. 185–186)

Territories at elevations of from 1600 to 2000 feet above sea-level. It is abundant on the steep, precipitous northern slopes of the Hunchbacks where it grows to about 15 feet in height, plants on the extreme exposed summit being of course smaller. Seedlings of all sizes are abundant beneath the trees. It grows in association with evergreen Oaks, *Schima Noronhae*, *Sterculia lanceolata*, *Machilus Thunbergii* and other evergreen trees; it may form almost pure stands. This species is very easy to recognize by its characteristic leaves. They are 4½ inches long, dark green above, the lower surface covered with a white or cork-brown powder, and the margins are curved downwards.

From six to twelve flower buds develop from a single apical bud which is covered with large bracts. The flower buds, as they push through the bracts, are rose bengal in colour (H.C.C. 25–25/2). As the cup-shaped flower unfolds the colour changes gradually to lighter tints of this hue (H.C.C. 25/2–25/3) and finally a fully opened flower may appear almost white. The inner surface is almost pure white with some greenish-yellow or reddish spots on the upper petal. This species is in flower in April and in early May. Diameter of flower 3 inches. (Fig. 57.)

### *Rhododendron Westlandii* Hemsley

This species was first discovered in 1886 by MR. A. B. WESTLAND on Lan Tau peak. In the colony it is known also from two other districts on the mainland but not from the Island. It has been recorded from the Phoenix Mountain, Swatow in Kwangtung, and from Hainan. The tree grows to 20, or occasionally 25, feet in height, on the southern slopes of the Hunchbacks and on the south-western slopes of Ma on shan (saddle mountain). It apparently does not grow on the precipitous northern slopes where *R. Fordii* and *R. ovatum* are to be found.

The leaves, which may be 5 inches long, are deep green and glossy above, slightly paler below and often with a red petiole. Flowers are borne in groups of five or six at the ends of the branches. In colour they are clear orchid-purple of the lightest tint (H.C.C. 31/3); the upper petal is spotted conspicuously with orange. The flowers are very fragrant and are certainly the most fragrant of the local species. In some seasons flowers are borne in abundance and the trees are then very beautiful. The flowering season is March and early April. Diameter of flower 3 or 3½ inches. (Fig. 58.)

### *Rhododendron Championae* Hooker

I do not think that this species occurs anywhere other than on Hong Kong Island. It has been recorded from Ma on shan

but I have never found it there though I have searched on several occasions. It was first described as a shrub of 6 or 7 feet in height but I know one tree 25 feet high and a second one 12 feet high. Since the war these are the only two specimens of this species I have seen (some had been cut during the war) but there may be others on the precipitous northern slopes of Victoria Peak. The leaves are very characteristic. The young leaves are glabrous above and have numerous white hairs on the lower surface and on the midrib; on the margin of the blade are two rows of hairs, one vertical and one in the plane of the leaf. In old leaves these hairs are black, probably due to an accumulation of city soot. Hairs are very conspicuous on the petioles.

Occasionally the flowers possess six instead of five petals. The flowers are borne in groups of five at the ends of the twigs; they are protected in the bud by exceedingly sticky bracts. As the buds push through they are seen to be of a clear pale rose-pink. The flowers on opening are very pale pink but they gradually fade to white. There are yellow markings on the upper petal. The flowers are fragrant but not as fragrant as those of *R. Westlandii*. The smaller of the two trees, when in flower, can easily be seen from the city of Victoria, 1500 feet below, standing out as a patch of white against a background of green. Flowering season April. Diameter of flower 4 to 4½ inches. (Fig. 60.)

# RHODODENDRON AWARDS FOR 1949

**Rhododendron 'Bulbul'** **A.M.** March 29, 1949. This particularly fine hybrid was obtained by crossing *R. bullatum* with *R. moupinense.* The flowers usually occur in pairs and are white in colour with faint yellow spotting. The stamens are long with distinct, chocolate-coloured anthers. Exhibited by Edmund de Rothschild, Esq., Exbury.

**Rhododendron 'Coronation Day'** ('Pink Shell' × 'Loderi') **A.M.** May 24, 1949. A strong growing, hardy shrub for the large garden. Its leaves are 6 inches long and 2 inches across, elliptic-oblanceolate with an undulate margin. The truss is large, flat-topped and made up of about eleven flowers, the corolla being 4½ inches long and 4½ inches wide with usually 6 to 7 lobes. These are of a delicate, mottled China Rose colour (H.C.C. 024/1) with a dark crimson blotch in the throat. Exhibited by C. E. Colbourne, Esq., Romsey. (**Fig. 23.**)

**Rhododendron eclecteum** (yellow form) **A.M.** March 29, 1949. A fine form of this variable species carrying umbels of about twelve Primrose Yellow (H.C.C. 601/3) flowers. The elliptic, dull green leaves are 3 inches long by 1½ inches wide. Exhibited by Edmund de Rothschild, Esq., Exbury.

**Rhododendron 'Elna'** ('Etna' × *Elliottii*) **A.M.** June 14, 1949. A very showy variety with a dome-shaped truss often up to 13-flowered. The broadly funnel-shaped corolla, borne on a viscid pedicel, is 2½ inches long and 3 inches wide, Scarlet in colour (H.C.C. 19/1) with pronounced brown spotting. The leaf is 7 inches long and 2 inches broad, narrow elliptic, and covered beneath with a loose brown tomentum. Exhibited by Lord Aberconway, C.B.E., LL.D., V.M.H., Bodnant.

**Rhododendron 'Fittra'** **A.M.** April 26, 1949. (*Fittianum* × *racemosum.*) A low growing shrub with small, elliptical leaves of dull green. The truss is globular, containing up to 30 flowers coloured Mallow Purple (H.C.C. 630/1); stamens distinct, with purple filaments and light brown anthers. Exhibited by Messrs. Hillier & Sons, Winchester. (**Fig. 24.**)

**Rhododendron 'Hawk'** (*Wardii* × 'Lady Bessborough') **A.M.** May 24, 1949. A very fine yellow hybrid which was raised by the late Mr. Lionel de Rothschild. The flat-topped, loose truss is made up of Sulphur Yellow flowers (H.C.C. 1/3) on long pedicels. The five-lobed corolla is funnel-shaped, 2 inches long and 2½ inches broad, with deeply emarginate lobes. The leaves are 4 inches long, elliptic with undulate margins, dark green above, pale beneath. Exhibited by The Commissioners of Crown Lands, Windsor. (**Fig. 21.**)

**Rhododendron 'Iliad'** ('Nereid' × *Kyawi*) **A.M.** June 14, 1949. A vividly coloured hybrid with funnel-shaped flowers 2½ inches long and 3 inches wide, of Blood Red (H.C.C. 820/3). The blooms hang in a loose, flat-topped truss, on villose pedicels. The leaves are 6 inches long and 2 inches wide with a glossy surface and recurved margins; the underside is covered with brown tomentum, soon becoming glabrous. Exhibited by Edmund de Rothschild, Esq., Exbury.

**Rhododendron 'Jack the Ripper'** **A.M.** May 24, 1949. A hardy flowering shrub from the cross of 'Erebus' and 'Jacquetta.' Its fine dark colouring, Blood Red (H.C.C. 820/2) with faint spotting on the upper three lobes makes the plant outstanding; the filaments are red, with black anthers. The leaves are up to 6 inches long and 2 inches wide, lanceolate with a loose, brown tomentum beneath. Exhibited by Lord Aberconway, C.B.E., LL.D., V.M.H., Bodnant. (Fig. 25.)

**Rhododendron 'Jibuti'** (*Griersonianum* × 'Gill's Triumph') **A.M.** June 14, 1949. A strong growing shrub with oblanceolate leaves about 7 inches long and 2 inches wide; dark green above, light green beneath with pronounced midrib. The large truss is conical, with each flower borne on a viscid pedicel. These are campanulate, glaucous, and a pleasing Neyron Rose (H.C.C. 623/1) with a dark venation. Exhibited by Edmund de Rothschild, Esq., Exbury. (Fig. 22.)

**Rhododendron 'Kenneth'** **A.M.** April 12, 1949. A hybrid between *R.* 'Hiraethlyn' and *R.* 'Elizabeth,' having glossy, dark green, broadly lanceolate leaves 5 inches long and 1½ inches wide, slightly pubescent beneath. There are 8-10 flowers in the truss with a petaloid calyx and a funnel-shaped corolla 3 inches wide and 2½ inches long; both are of Geranium Lake (H.C.C. 20). Exhibited by Lord Aberconway, C.B.E., LL.D., V.M.H., Bodnant.

**Rhododendron 'Lady Berry'** **F.C.C.** May 24, 1949. A very fine hybrid from the cross between 'Rosy Bell' and 'Royal Flush.' The plant has an erect habit, with oblanceolate leaves about 4 inches long, bright green above and densely scaly beneath. The loose truss contains about five pendulous flowers; each fleshy corolla is 2½ inches wide and 3 inches long, attractively coloured Rose Opal (H.C.C. o22/3) inside and outside Jasper Red (H.C.C. o18/1), gradually paling towards the five-lobed mouth. Exhibited by Edmund de Rothschild, Esq., Exbury. (Fig. 1.)

**Rhododendron lanigerum** **A.M.** March 29, 1949. This large-leaved species, belonging to the Falconeri series, was collected by Capt. F. Kingdon-Ward in Assam. The leaves reach a length of 10 inches and are clad beneath with a woolly felt. The dense truss is made up of 20-25 tubular-campanulate, Carmine flowers (H.C.C. 21/1-21/2) each 2¼ inches long, and 2 inches wide. Exhibited by Col. E. H. Bolitho, D.S.O., Trengwainton, Penzance.

**Rhododendron 'Queen of Hearts'** **A.M.** April 26, 1949. A striking plant with the parentage of *R. Meddianum* × 'Moser's Maroon.' The dome-shaped truss is made up of sixteen flowers of Chrysanthemum Crimson (H.C.C. 824) spotted with black on the three upper lobes. The corolla is 2½ inches long and 3 inches across, the lobes being deeply emarginate while the red calyx has large acuminate lobes. The leaves are elliptic-lanceolate, 4¼ inches long and 2¼ inches broad, covered beneath with loose brown tomentum. Exhibited by Edmund de Rothschild, Esq., Exbury.

# RHODODENDRON COMMITTEE MEETINGS 1949

MARCH 1, 1949—MR. J. B. STEVENSON, V.M.H., in the Chair, and eight other members present.

**Exhibit**

*Rhododendron* 'Early Stir' (*strigillosum* × *irroratum*), from COL. THE LORD DIGBY, D.S.O., M.C., T.D., Cerne Abbey, Dorchester, Dorset.

MARCH 15, 1949—MR. J. B. STEVENSON, V.M.H., in the Chair, and seven other members present.

**Exhibit**

*Rhododendron* 'R. W. Rye' (*chrysodoron* × *Johnstoneanum*), from the RT. HON. EARL OF STAIR, K.T., D.S.O., Lochinch, Stranraer. As the specimen submitted had been damaged by frost the Committee wished to see the plant again, at a future meeting.

MARCH 29, 1949—MR. J. B. STEVENSON, V.M.H., in the Chair, and thirteen other members present.

**Awards Recommended**

*Award of Merit*

To *Rhododendron* 'Bulbul' (*bullatum* × *moupinense*) (votes 14 for, 0 against), as a hardy flowering shrub, from E. DE ROTHSCHILD, ESQ., Exbury, nr. Southampton.
To *Rhododendron eclecteum* (yellow form) (votes 12 for, 0 against), as a hardy flowering shrub, from E. DE ROTHSCHILD, ESQ.
To *Rhododendron lanigerum* (votes 9 for, 3 against), from COL. E. H. BOLITHO, D.S.O., Trengwainton, Heamoor S.O., Penzance, Cornwall.

**Other Exhibits**

*Rhododendron patulum* and *R. virgatum* (white form), from the DIRECTOR, R.H.S. Gardens, Wisley, Ripley, Surrey.
*Rhododendron* 'Fine Feathers' var. 'Primrose' from LORD ABERCONWAY, C.B.E., LL.D., V.M.H., Bodnant, Tal-y-Cafn, Denbighshire.
*Rhododendron* 'Spinulosum' (*spinuliferum* × *racemosum*) and *R. Macabeanum* from E. DE ROTHSCHILD, ESQ., Exbury, nr. Southampton.
*Rhododendron Johnstoneanum*, *R. spiciferum* and an unnamed specimen to be sent to Edinburgh for identification from COL. E. H. BOLITHO, D.S.O., Trengwainton, Heamoor S.O., Penzance, Cornwall.
*Rhododendron fulgens*, from MAJOR A. G. HARDY, Sandling Park, Hythe, Kent.
*Rhododendron fulgens* (?) to be sent to Edinburgh for naming, from MICHAEL HAWORTH-BOOTH, ESQ., Farall, Haslemere, Surrey.

APRIL 12, 1949—MR. J. B. STEVENSON, V.M.H., in the Chair, and sixteen other members present.

**Awards Recommended**

*Award of Merit*

To *Rhododendron* 'Kenneth' ('Hiraethlyn' × 'Elizabeth') (votes unanimous), as a hardy flowering shrub, from LORD ABERCONWAY, C.B.E., LL.D., V.M.H., Bodnant, N. Wales.

*Selected for Trial at Wisley*

*Rhododendron* 'Mrs. Wery' (*malvatica* × Kurume 'Flame'), exhibited by MESSRS. M. P. KOOPER & SONS, Muirfield, Ferndown, Dorset.

**Other Exhibit**

*Rhododendron selense* (?), from MICHAEL HAWORTH-BOOTH, ESQ., Farall, Haslemere, Surrey.

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APRIL 26, 1949—MR. J. B. STEVENSON, V.M.H., in the Chair, and eighteen other members present.

*Arising out of the previous Minutes*, *Rhododendron* "No. 9" which received the A.M. when exhibited by COL. E. H. BOLITHO, D.S.O., has now been identified as *R. lanigerum*, and *R.* "No. 10" as *R. irroratum*.

**Awards Recommended**

*Award of Merit*

To *Rhododendron* 'Queen of Hearts' (*Meddianum* × 'Moser's Maroon') (votes unanimous), as a hardy flowering shrub, from E. DE ROTHSCHILD, ESQ., Exbury, nr. Southampton.

To *Rhododendron* 'Fittra' as a hardy flowering shrub, from MESSRS. HILLIER & SONS, Winchester.

**Other Exhibits**

*Rhododendron* 'Querida' ('Red Knight' × *Elliottii*), *R.* 'Janet' ('Dr. Stocker' × 'Avalanche'), *R.* 'Chaffinch' ('Countess of Haddington' × *ciliatum*), from E. DE ROTHSCHILD, ESQ., Exbury, nr. Southampton.

*Rhododendron* 'Loderi' var. 'Pearly Queen' ('Loderi King George' × 'Loderi Sir Edmund'), *R.* 'Gem' var. 'Red Glow' (*Thomsonii* × *Halopeanum*), from SIR GILES LODER, BT., Leonardslee, Horsham, Sussex.

*Rhododendron Vaseyi*, from R. D. TROTTER, ESQ., Leith Vale, Ockley, Surrey.

*Rhododendron* 'Retrich' (*reticulatum* × *Weyrichii*), *R.* 'Citronella' (? × *campylocarpum*), *R.* 'Snow Leopard,' *R.* 'Lindo' (? 'Lady Eleanor Cathcart' × ? 'Mrs. Lindsay Smith'), from CAPT. COLLINGWOOD INGRAM, The Grange, Benenden, Cranbrook, Kent.

*Rhododendron* (*Williamsianum* × *didymum*) from Orchard Neville Nurseries, Ltd., Baltonsborough, nr. Glastonbury, Somerset.

*Rhododendron Simsii* 'Queen Elizabeth,' from MESSRS. HILLIER & SONS, Winchester.

*Rhododendron* 'Grayswood Pink' (*Williamsianum* × *venator*), from G. H. DOWTY, ESQ., Grayswood Hill, Haslemere, Surrey.

*Rhododendron caeruleum* var. *album* (A.M. 1946); and *R. glaucum* ? and *R.* Farrer No. 873 to be sent to Edinburgh for naming, from LORD ABERCONWAY, C.B.E., LL.D., V.M.H., Bodnant, North Wales.

*Rhododendron arboreum* pink form, from E. J. LUGARD, ESQ., Furzen Wood, Abinger Common, Dorking.

*Rhododendron adenogynum*, *R. crinigerum* aff, *R. yunnanense* seedling; and *R. Fargesii* ? and an unnamed specimen to be sent to Edinburgh for naming, from the MISSES GODMAN, South Lodge, Horsham, Sussex.

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MAY 24, 1949—MR. J. B. STEVENSON, V.M.H., in the Chair, and fourteen other members present.

**Arising out of the previous Minutes**

The Secretary reported that DR. J. MACQUEEN COWAN had identified the plants submitted to the Committee on April 26, as follows:—

From LORD ABERCONWAY, C.B.E., LL.D., V.M.H.:

*Rhododendron glaucum* (?), as a form of *R. shweliense*.

*Rhododendron* Farrer 873, he wishes to see this plant again when normal flowers appear.

From the MISSES GODMAN:

*Rhododendron Fargesii* as *R. vernicosum.*

*Rhododendron* No. 10 as *R. cantabile.*

*Rhododendron fulgens* (?) submitted to the Committee on March 29, by M. HAWORTH-BOOTH, ESQ., is considered by DR. J. MACQUEEN COWAN to be a small flowered form of *R. Meddianum* but further material should be submitted next year to confirm this.

### Awards Recommended

*First Class Certificate*

To *Rhododendron* 'Lady Berry' ('Rosy Bell' × 'Royal Flush') (votes 9 for, 1 against), as a hardy flowering shrub, from E. DE ROTHSCHILD, ESQ., Exbury, Southampton.

*Award of Merit*

To *Rhododendron* 'Hawk' (*Wardii* × 'Lady Bessborough') (votes 12 for, 1 against), as a hardy flowering shrub, from COMMISSIONERS OF CROWN LANDS, Windsor Great Park, Berks.

To *Rhododendron* 'Coronation Day' ('Pink Shell' × 'Loderi') (votes 9 for, 2 against), as a hardy flowering shrub, from C. E. COLBOURNE, ESQ., Romsey College, Embley Park, Romsey, Hants.

To *Rhododendron* 'Jack the Ripper' ('Erebus' × 'Jacquetta') (votes 6 for, 2 against), as a hardy flowering shrub, from LORD ABERCONWAY, C.B.E., LL.D., V.M.H., Bodnant, North Wales.

### Selected for trial at Wisley

*Rhododendron* 'Kluis' Triumph' from MR. FREDERICK STREET, Heathermead Nursery, West End, Woking, Surrey.

*Rhododendron* (Azalea) 'Lanarth' from MR. W. J. MARCHANT, Keepers Hill, Stapehill, Wimborne.

### Other Exhibits

*Rhododendron* No. 507 ('Master Dick' × *Griersonianum*) and *R.* No. 439 (*arboreum* 'Blood Red' × *Elliottii*) from C. E. COLBOURNE, ESQ., Romsey College, Embley Park, Romsey, Hants.

*Rhododendron* 'General Eisenhower,' *R.* 'Spitfire' and *R.* 'Winston Churchill' from MR. FREDERICK STREET, Heathermead Nursery, West End, Woking, Surrey.

*Rhododendron croceum* (A.M. 1926) and *R. Souliei* (F.C.C. 1909) from MAJOR A. E. HARDY, Sandling Park, Hythe, Kent.

*Rhododendron* 'Radiant Morn' ('Fabia × 'Sunrise'), *R.* 'Eventide' ('Sunrise' × *Griersonianum*), *R.* 'Radiance' ('Vanessa' × *Griersonianum*) and *R.* 'Vega' ('Fabia' × *haematodes*) from LORD ABERCONWAY, C.B.E., LL.D., V.M.H., Bodnant, North Wales.

*Rhododendron Souliei* (F.C.C. 1909) and *R. Souliei* White variety from COMMISSIONERS OF CROWN LANDS, Windsor Great Park, Windsor, Berks.

*Rhododendron* ('Britannia' × 'Panoply') and *R.* 'Limerick' ('Britannia' × *dichroanthum*) from EARL OF LIMERICK, K.C.B., D.S.O., Chiddingly, West Hoathly, Sussex.

*Rhododendron* 'Rosy Morn' ('Loderi' × *Souliei*) from COL. THE LORD DIGBY, D.S.O., M.C., T.D., Cerne Abbey, Dorchester, Dorset.

*Rhododendron* 'Bulldog' (*Elliottii* × 'Earl of Athlone'), *R.* 'Lanyon,' (*Elliottii* × *haematodes*) and *R.* 'Radium' and 'Penalverne' (*Griersonianum* × 'Earl of Athlone') from COL. E. H. BOLITHO, D.S.O., Trengwainton, Heamoor S.O., Penzance, Cornwall.

*Rhododendron* 'Daydream' ('Lady Bessborough' × *Griersonianum*) (A.M. 1940) from E. DE ROTHSCHILD, ESQ., Exbury, nr. Southampton.

JUNE 14, 1949—LORD ABERCONWAY, C.B.E., LL.D., V.M.H., in the Chair, and six other members present.

### Awards Recommended

*Award of Merit*

To *Rhododendron* 'Elna' ('Etna' × *Elliottii*) (votes 6 for, 0 against), as a hardy flowering shrub, from LORD ABERCONWAY, C.B.E., LL.D., V.M.H., Bodnant, North Wales.

To *Rhododendron* 'Jibuti' (*Griersonianum* × 'Gill's Triumph') (votes 6 for, 0 against), as a hardy flowering shrub, from E. DE ROTHSCHILD, ESQ., Exbury, nr. Southampton.

To *Rhododendron* 'Iliad' ('Nereid' × *Kyawi*) (votes 6 for, 0 against), as a hardy flowering shrub, from E. DE ROTHSCHILD, ESQ., Exbury, nr. Southampton.

### Other Exhibits

*Rhododendron* 'Solon' ('Astarte' × 'Sunrise'), from LORD ABERCONWAY, C.B.E., LL.D., V.M.H., Bodnant, North Wales.

*Rhododendron* ('Kewense' × *Griersonianum*), from DR. M. AMSLER, Delmonden Manor, Hawkhurst, Kent.

*Rhododendron bullatum* (KW 8052), from COL. F. C. STERN, O.B.E., M.C., F.L.S., V.M.H., Highdown, Goring-by-Sea, Sussex.

*Rhododendron* 'Isabella' (*auriculatum* × *Griffithianum*), *R.* 'Felis' (*dichroanthum* × *facetum*), *R.* 'Ophelia' (*cyclium* × *auriculatum*) and *R.* 'Ingrid' ('Tally Ho' × *Griffithianum*), from E. DE ROTHSCHILD, ESQ., Exbury, nr. Southampton.

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JUNE 28, 1949—MR. J. B. STEVENSON, V.M.H., in the Chair, and six other members present.

### Exhibits

*Rhododendron* 'Venus' ('Amaura' × *facetum*) from LORD ABERCONWAY, C.B.E., LL.D., V.M.H., Bodnant, North Wales.

*Rhododendron* 'Antonio' var. 'Omega' ('Gill's Triumph' × *discolor*), *R.* 'Jutland' (*Elliottii* × 'Bellerophon') (A.M. 1947), *R.* 'Oklahoma' ('Bellerophon' × 'Tally Ho') and *R.* 'Indiana' (*scyphocalyx* × *Kyawi*), from EDMUND DE ROTHSCHILD, ESQ., Exbury, nr. Southampton.

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(*a*) = *Azalea*