RHODODENDRONS

WITH
CAMELLIAS and MAGNOLIAS
1999

THE ROYAL
HORTICULTURAL
SOCIETY

Acknowledgements

TO THIS ONLINE EDITION

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RHS
Rhododendron, Camellia & Magnolia Group

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CONTENTS

CHAIRMAN'S FOREWORD 5

EDITORIAL 7

MAGNOLIA × *LOEBNERI* – A QUESTION OF IDENTITY? 9
by Graham Rankin

FURTHER RHODODENDRON HUNTING IN VIETNAM – PART 2 13
by Keith Rushforth

RAISING RHODODENDRONS FROM SEED 18
by E G Millais

THE HARDY GHENT AZALEA NATIONAL COLLECTION 22
by Nigel Davis

THE PHOTOGRAPHIC COMPETITION 24

CAMELLIAS OF THE UPPER JINSHA JIANG (YANGTZE) OF YUNNAN AND SICHUAN, CHINA 25
by Clifford R Parks and Tiao-jiang Xiao

MAGNOLIA IMPROVEMENT 39
by August E Kehr

THE SALWEEN 45
by Peter Cox

TOWARDS LIME-TOLERANT RHODODENDRONS 51
by Judy Rose, Lyn Andrews, Tim Marks and Ken Tobutt

AN EXPEDITION TO SULAWEZI, INDONESIA – MAY 1997 58
by John Farbarik and Hank Helm

RHODODENDRON, CAMELLIA AND MAGNOLIA NOTES 64
Magnolia 'Vulcan' in England
by Mike Robinson
An old hardy hybrid rediscovered
by Maurice Foster
Camellia granthamiana – the man behind the name
Peter Smithers

THE RHODODENDRON GROUP TOUR, DUMBARTON AND ARGYLL, 9-13 MAY 1998 66
by Bruce Archibold

THE RHODODENDRON AND CAMELLIA COMPETITIONS
The Early Rhododendron Show 71
by David Farnes
The Main Rhododendron Show: Species 73
by Archie Skinner
The Main Rhododendron Show: Hydrids 74
by Brian Wright
The Camellia Shows 75
by Cicely Perring

AWARDS 78

BOOK REVIEW 80

COMMITTEES 82

INDEX 85

ERRATUM

Page 4 – caption for back cover should read:
Back cover: R. johnstoneanum, a winner (Class 1) at the Vincent Square Flower Show (top); an unnamed Exbury hybrid at the Main Rhododendron Show (bottom right) . . .

Coloured Illustrations

Front cover: Magnolia × *loebneri* 'Pirouette' (Graham Rankin)
Back cover: An unnamed Exbury hybrid at the Main Rhododendron Show (top); *R. johnstoneanum* (bottom right), a winner (Class 1) at the Vincent Square Flower Show, 14 April, 1998; *Camellia* 'Nuccio's Jewel' (bottom left), one of the six blooms that won Class 11 for Mr David Davis at the Main Camellia Show (Photos Great Britain)

Figure 1: Magnolia × *loebneri* 'Ballerina' (Graham Rankin)
Figure 2: M. × *loebneri* 'Merrill' (Graham Rankin)
Figure 3: M. 'Gold Crown' (Marilyn Tostlebe)
Figure 4: Overview of dissected countryside from Longzhoushan, Sichuan (Clifford Parks)
Figure 5: Flowers from nine different plants of an unnamed diploid camellia (Clifford Parks)
Figure 6: Camellia tenuivalvis (Clifford Parks)
Figure 7: Floral variation among eight different plants of *C. pentaphylax* (Norihiro Yoshikana)
Figure 8: A naturally occuring double-flowered form of *C. reticulata* (Norihiro Yoshikana)
Figure 9: C. brevigyna (Clifford Parks)
Figure 10: Rhododendron saxicolum (Keith Rushforth)
Figure 11: A new taxon from Vietnam (Tom Hudson)
Figure 12: R. leptocladon (Keith Rushforth)
Figure 13: Rhododendron seedlings germinating in half size seed trays (E G Millais)
Figure 14: Rhododendron seedlings pricked out into module trays (E G Millais)
Figure 15: Rhododendron seedlings after spring potting (E G Millais)
Figure 16: The River Salween and the town of Gongshan (Philip Evans)
Figure 17: R. monanthum (Philip Evans)
Figure 18: R. edgeworthii with unusually thick indumentum (Philip Evans)
Figure 19: R. lagunculicarpum (Hank Helm)
Figure 20: R. pseudobuxifolium (Hank Helm)
Figure 21: R. rhodopus (Hank Helm)
Figure 22: R. 'Lea Rainbow', winnner of the Photographic Competition (C F Taylor)
Figure 23: R. diaprepes, runner up in the Photographic Competition (J Wilkes-Jones)
Figure 24: R. excellens, runner up in the Photographic Competition (K Clapp)
Figure 25: Sir Alexander Grantham
Figure 26: R. 'Distinction' with *R. campanulatum* (Maurice Foster)
Figure 27: Camellia 'Interval' (Photos Great Britain)
Figure 28: Rhododendron niveum × *R. eximium* (Photos Great Britain)
Figure 29: R. christianae (Photos Great Britain)
Figure 30: exhibit of Vireyas by RBG Edinburgh (Photos Great Britain)
Figure 31: R. ludwigianum at Arduaine (Bruce Archibold)
Figure 32: R. niveum at Stonefield Castle Hotel (Bruce Archibold)
Figure 33: Magnolia 'Yellow Bird' (Maurice Foster)

Foreword

John Bond

The year since I wrote the foreword for the 1998 Year Book appears to have flown by and now I am confronted with the task, a very pleasant task I might add, of writing the foreword for 1999.

From my observations, the past rhododendron, camellia and magnolia season proved to be an excellent one with a very heavy flowering of rhododendrons and camellias, all of which appeared to be of good quality. Credit for this should be given to the high rainfall of the early spring and even more importantly the lack of the disastrous late spring frosts that much of Britain has experienced in recent years. Obviously such an exciting flowering cannot happen without a good bud set during the previous summer.

The contents of this Year Book are as always first class with much original work. Nigel Davis, the Property Manager at Sheffield Park, is reporting on the very important National Collection of Ghent Azaleas which are in his care, and Ted Millais has produced a very practical paper entitled Raising Rhododendrons from Seed – a very important task, for propagation leads to good plants for our gardens. The ever present topic of lime-tolerant rhododendrons which is dealt with by Dr Judy Rose will make us think. August Kehr will keep us up to date with magnolia improvements. He is well placed to write such a paper for he is much involved with breeding new hybrids. Graham Rankin discusses the *Magnolia* × *loebneri* group in detail.

Papers concerned with travel and, in particular, plant collecting are much to the fore these days and quite rightly as it is important to be aware of the findings and the experiences of the lucky few who are able to travel to the far distant happy hunting grounds. I shall look forward especially to Dr Clifford Parks' account of wild camellias in China. Keith Rushforth has provided his last paper on his Vietnam travels and, keeping to the warmer areas of the world, John Farbarik and Hank Helm take us to a very different plant world, Indonesia. Last but not least Peter Cox provides us with another super account of his travels during 1997.

Writing this last paragraph has made me consider the vast amount of seed that has arrived, mainly from China and Tibet, over the past 25 years or so. I am thinking particularly about rhododendrons, keeping in mind the hat that I am wearing, but there is of course so much more. The great wealth of trees, shrubs and herbaceous plants is equally exciting. Much of this seed is of reintroduced species which is extremely important. Quite a lot of it is, however, new to our gardens and of even greater importance. I hope that good representative plantings on a large scale can be made of these plants and here, of course, we have to look to the botanic

gardens and larger establishments to take the lead. I have no doubt that private enthusiasts will play their part but there is in the main greater security in the long term with botanic gardens. I am, however, equally aware that finance, always a problem, plays a major role in such developments.

Lastly, I want to thank all our excellent contributors for producing such good papers and our editor, Philip Evans, who has so efficiently drawn these papers together. Happy woodland gardening.

Editorial

Philip Evans

We are fortunate to live at a time of swift and (relatively) affordable air travel around the world, for the asiatic homelands of rhododendrons, camellias and magnolias are more open to visitors now, whether the taxonomist or the ordinary plant lover, than for the last 50 years. This Year Book includes no less than four separate accounts of plant hunting expeditions in very different parts of the Far East, each of them, one way or another, adding original and interesting information to our knowledge of 'our' genera.

Keith Rushforth's article, which he has updated with new information even since it was originally completed a year ago, is part of a sequence that records the exploration of the rhododendron species of Vietnam. Commencing with his initial article in the 1993 Year Book, continued with the first part of this article in 1998, it is now brought up to date (I hesitate to say concluded) with this 1999 article. I do recommend having the 1993 and 1998 Year Books out of the bookshelf, when reading this article, since many of his references and attributions are to taxa originally described in the earlier articles.

I would also comment on the article by Dr Clifford Parks and Tiao-jiang Xiao on the Camellias of the Upper Yangtze. Originally Dr Parks was asked for a general piece about his recent camellia field studies. What we have been privileged (and I do not think that is an over statement) to receive and print, is an original and comprehensive paper on the taxonomic 'detective work' in which he and his team at the University of North Carolina have been engaged, for the last several years, on the *C. reticulata* complex. Certainly it is a significant article for the Year Book; perhaps some of their conclusions will stimulate debate.

The romance of travel and plant hunting are I think adequately counterbalanced in this edition of the Year Book by a number of informative articles on various aspects of cultivation. As a matter of interest, when Ted Millais suggested two articles on contemporary methods of rhododendron propagation, commencing with growing from seed, I quickly checked this prosaic sounding subject in the new Composite Index. To my surprise, while there was, of course, a symposium of different members' methods in 1996, the last full article on the subject seems to have been as long ago as 1972, 27 years ago.

I would, in conclusion, like to draw attention to the Editorial Subcommittee, which may sometimes be overlooked appearing, as it does, in very small print opposite the Contents page. Its members, Maurice and Rosemary Foster and Brian Wright, have been very supportive of this Editor with advice and ideas over the last two years, and I am most grateful to them.

Magnolia × loebneri - A Question of Identity?

Graham Rankin

One would assume that writing a short article on the *Magnolia* × *loebneri*'s – a group which must rate as the most garden worthy magnolias for general cultivation – would not be a particularly tortuous undertaking or one that adds to the ageing process. That is until the necessary realms of taxonomy and nomenclature begin to rear their ugly heads.

The genus as a whole has been fraught with problems of this kind ever since we started trying to categorize and regiment it during the middle of the 18th century. I suppose it was destined to have a history of confusion from the onset. When Linnaeus introduced the binomial system he took Charles Plumiers' generic name *Magnolia*, which was given to a West Indian tropical plant, and unintentionally applied it to another plant in the same family, the plant we now know as *Magnolia virginiana*. Charles Plumiers' *Magnolia* is now the genus *Talauma*. (Recently some authorities consider that the genus *Talauma* should be abandoned and included within the genus *Magnolia*.)

I, like many others, welcomed with open arms the retention of magnolia names such as *denudata* instead of *heptapeta* and *liliiflora* instead of *quinquepeta*. It is now the most familiar species in the genus, *M. stellata* and some of its offspring, which continue to be a bone of contention, and cause the most controversy regarding their taxonomic rank.

In the most recent book on magnolias written by Dorothy Callaway in 1994 (*The World of Magnolias*), *M. stellata* has been sunk into *M. kobus* and is considered a variety of that species, as is *M.* × *loebneri*. She states that 'it was by far the most difficult taxonomic decision [she] made in the book'.

Until 1954 *M. stellata* had always been considered a species in its own right, but various observations made by eminent botanists have disputed this (an account of which is documented in Dorothy Callaway's book pp. 154-55). Observations were made of its seed-raised progeny, in which 50 per cent of *M. stellata* seed produced plants typical of *M. kobus* with only a small fraction producing plants similar to its parent, the remainder being intermediate between the two. Another factor was the similarity in the floral characteristics, and there is also doubt as to whether *M. stellata* is actually a species native to Japan, but rather a plant of garden origin.

If we accept that *M. stellata* should be regarded as a variety of *M. kobus* the plot thickens; what happens to the *M.* × *loebneri* hybrids that are caught up in the middle?

Magnolia × *loebneri* is the name given

to all plants with *M. kobus* as one parent and *M. stellata* (or any of their respective cultivars) as the other. Max Löbner who was Garden Inspector at Dresden Botanical Gardens made the first cross between these two species. It first flowered in 1917, and in appearance was intermediate between the two parents, growing into a small slender branched tree, with 12 pure white tepals.

Dorothy Callaway has adopted Stephen Spongberg's approach by giving *M.* × *loebneri* variety status, to encompass the intermediate forms, thus ending up with what appears to be clear, clean cut categories:

Magnolia kobus
Magnolia kobus var. *stellata*
Magnolia kobus var. *loebneri*

The use of *Magnolia kobus* var. *loebneri* to encompass 'all the intermediate forms' including both intentional crosses and spontaneous hybrids is not as clean cut as it first appears. Many of the *M.* × *loebneri* cultivars, for instance 'Leonard Messel' and 'Neil McEachern', are open-pollinated seedlings of *M. stellata* which have developed an arborescent habit. Therefore it has been 'assumed' that pollen from a nearby *M. kobus* had a hand in the fertilization. But going on the 50 per cent theory, it is normal for *M. stellata* to produce seedlings of an arborescent habit anyway, so it is probable that a promiscuous *M. kobus* is being accused of a sexual relationship when it may not have been anywhere in the vicinity.

Does this then mean that well-known *M.* × *loebneri* hybrids such as 'Leonard Messel' and 'Neil McEachern' are not actually *loebneri* hybrids at all, but should be delegated as cultivars of *M. stellata*?

The distinction of an 'intermediate' form can be very ambiguous. I recently showed a Danish plantsman a plant of the exceptionally fragrant *M. stellata* 'Scented Silver' growing here at Hascombe Court which was grafted in 1989 and is now a small tree 5m (15ft) high. He must have thought that this part of Surrey had a microclimate similar to that of the Italian Riviera with an isolated pocket of rich, moist alluvial loam, instead of the gutless greensand (which has an affinity to the beach at Worthing). That year the branches of 'Scented Silver' had put on 60cm (2ft) of growth to which he commented, 'a stellata in Denmark would never do that!' *M. stellata* 'Scented Silver' is a seedling of *M. stellata* 'Green Star', raised by Dr Frank Galyon in the US, which again has produced that arborescent kobus-like habit, but is registered as a cultivar of *M. stellata*, not as *M.* × *loebneri*.

At the other extreme, two magnolia cultivars that grow here 'Pirouette' and 'Powder Puff' have a slow, compact, twiggy habit typical of *M. stellata* yet are considered *M.* × *loebneri* hybrids. Confused?

Two recent publications, *The RHS Plant Finder 1998-99* (compiled by the Royal Horticultural Society) which states it is 'the recognized authority on plant nomenclature' and the *World Checklist and Bibliography of Magnolias* (published in 1996 by the Royal Botanic Gardens Kew), both give *M. stellata* its own specific rank. Until this taxonomic and nomenclatural dilemma is sorted out I shall cover my back and resort to the nomenclature more commonly used this side of the Atlantic.

I have always admired this group of

plants and their simple charm, perhaps because of childhood memories in the Chilterns 'trying' to garden with heavy clay intermixed with chalk and flint (an experience I wish never to repeat). Yet this group of magnolias, with a little encouragement, grew quite well, particularly a plant of *M.* × *loebneri* 'Leonard Messel'.

In 1997, after the most spectacular flowering of the precocious magnolias I had ever seen, I don't suppose I was the only person in the home counties whose heart sank with the cries of 'Oh No'. The sight of the blackened new growth after the severe frost of the night of the 20/21 April is still a vivid memory. The same day I went to the RHS Garden Wisley and as I drove towards the car park glancing up at Battleston Hill, it was very apparent that they too had suffered. The frosted growth particularly on the magnolias was clearly visible. Surprisingly amid the devastation, a few magnolias were totally unaffected, namely *M. kobus, M. stellata* and *M.* × *loebneri.*

The loebneri's have many attributes other than their hardiness – ease of cultivation (including the tolerance of slightly alkaline soils), moderate size, flowers from an early age, and leaves that can often have good yellow autumn colour, something the genus is not renowned for. While their floral impact is not comparable to the large-flowered precocious Asiatic magnolias, such as *M. campbellii, M. sargentiana, M. sprengeri* and *M. dawsoniana*, the number of flowers they can produce is unequalled. With the various cultivars ranging in size from large shrubs to medium-sized trees, they contend as the most accommodating magnolias for small to medium-sized gardens.

This opinion is not shared by all. G H Johnstone in his book *Asiatic Magnolias in Cultivation* states 'the hybrid *Magnolia* × *loebneri* is certainly no improvement on either parent'. He continues 'the same may be said of *Magnolia* × *proctoriana* which was obtained by crossing *Magnolia salicifolia* with *Magnolia stellata*'. (I do agree with his opinion of *M.* × *proctoriana.*)

In the 1958 *Journal of The Royal Horticultural Society* an article by R C Jenkinson on Irish Gardens and Gardeners mentions on visiting Birr Castle in Ireland, 'not to miss *Magnolia* × *loebneri* that very rare hybrid. Those who garden on chalk or limy soils should especially note it – if they can get it!' Fortunately it is no longer a rare plant, most garden centres usually sell at least one of the cultivars.

There are now approximately 20 *M.* × *loebneri* cultivars, half of which are listed in *The RHS Plant Finder 1998-99.* None I have seen to date deserve 'chainsaw status', and all are worthy of cultivation.

Not many people are fortunate enough to have endless acres; usually space is at a premium, and selecting the better cultivars of any plant is important. If I had to choose the best of the bunch from the *M.* × *loebneri* cultivars, the following would be my favourites to date.

'Ballerina' was registered in 1969. It has pleasantly scented pale pink flowers, which gradually fade to white as they mature and have up to 30 tepals. It flowers later than the others and has a compact habit. Useful for the smaller garden (see fig. 1)

'Donna' has very large, pure white, fragrant flowers, according to literature up to

20cm (8in) across, the largest of any *M.* × *loebneri* cultivar. The flowers of my 10-year-old plant have never exceeded 15cm (6in) and I somehow doubt that they will. It has a compact habit.

'Encore'. I have not seen a mature plant of this cultivar in Britain, but when I saw one in Switzerland I was most impressed. It was just a solid mass of flower. It has multiple white flowers at the end of the branches and the flowers continue to open over a long period, hence its name. It has a very compact habit and is slow growing.

'Leonard Messel' is by far the most widely grown and planted. It was a seedling of *M. stellata* 'Rosea' but was assumed to be a hybrid with *M. kobus*. It was planted at Nymans in Sussex around 1940, and received an FCC in 1969. Despite its antiquity among the group, its only rival could be the relative newcomer, 'Raspberry Fun' which is an open-pollinated seedling of the above selected by Ferris Miller of the Chollipo Arboretum in Korea. It is very similar in flower but the flowers are formed in clusters. The plant I knew was too young to make a definitive comparison.

'Merrill' is another one of the originals, registered in 1952. It has a compact habit, when grown in the open. Mature plants are as wide as they are high and become small to medium-sized trees. It smothers itself with semi-double, pure white, scented flowers (see fig. 2). A recent introduction called 'Donna' (see above) may possibly knock 'Merrill' off its pedestal.

'Pirouette' a plant from Tetsuo Magaki in Japan, has a flower of a very beautiful distinctive form (see front cover). The outer tepals are shorter than the central ones giving the small, pure white flower a very pretty globular shape. This cultivar seems to be slow growing and very shy to flower when young, only now flowering with profusion after nine years – quite exquisite.

'Spring Snow' is an American selection that probably originated from open-pollinated *M. stellata* seed. The flowers are pure white and fragrant, with 15-20 tepals. Young flowers have a slight green shading at the centre. It will grow into a small, round headed tree to 8m (30ft).

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Further Rhododendron Hunting in Vietnam – Part 2

Keith Rushforth

The numbers in square brackets refer to taxa described in the article 'Rhododendron Hunting in Vietnam' in the 1993 Year Book

I will start with an update on the subsect. Grandia species [1] on Suoi Doi (see fig. 11). Tom and Jo Hudson (of Tregrehan, Cornwall) visited Suoi Doi in March and found it in flower. This confirms it is a new taxon related to, but distinct from both *R. sinogrande* and *R. grande*. The identity of the plant [3] found on Suoi Doi with cup-shaped hairs remains a mystery. Contrary to what I said in Part 1, it is not typical *R. sinofalconeri*, which is the beautiful species occurring from 2,900m (9,500ft) to the very summit of Fan Si Pan [2]. The Suoi Doi plant with cup-shaped hairs could be a hybrid of *R.* aff. *sinogrande* with *R. sinofalconeri*. However, my suspicion is that the cup shaped hairs represent introgression of *R. sinofalconeri* genes into *R.* aff. *sinogrande* rather than a direct hybrid; it would not be the first plant to disregard its botanical classification.

Subgenus *Rhododendron* is represented by three subsections, Maddenia, Tephropepla and Edgeworthia. My personal view is that subsect. Maddenia comprises two or probably three unrelated groups, centred around *R. maddenii*, *R. nuttallii* and *R. ciliatum*, and I suspect (or hope?) that these may get described as separate subsections at some stage. subsect. Edgeworthia, as *R. edgeworthii* [17], I know only from two seedlings found on Fan Si Pan in 1992. My earlier suggestion that there could be members of subsections Triflora and Boothia in the area has not been substantiated by recent trips.

The subsect. Maddenia is complex. *R. maddenii* [9] is widespread above 1,700m (5,500ft), getting as high as 3,000m (10,000ft) on Fan Si Pan. I suspect there are two taxa masquerading under this name in the area, but confirmation (or otherwise) of this will have to await Janet Cubey's researches.

The Nuttallii group includes two species, which were clearly separated (see my 1993 account). *R. nuttallii* [10] occurs at generally lower altitudes on drier and warmer sites (from 1,700m [5,500ft] up to 2,200m [7,300ft] or so) compared to *R.* aff. *excellens* (from circa 2,000m [6,500ft] to 2,400m [8,000ft]). I have only seen the *R.* aff. *excellens* [11] taxon in flower. In foliage, the leaves of *R. nuttallii* (I am talking about the Vietnamese and southern Yunnan plants,

I have no knowledge of the Himalayan plants) have a purplish cast, especially in the new growth and are much broader. They are dull glaucous beneath, compared to the more silvery colour of *R.* aff. *excellens*. In southern Yunnan, on the Dawei Shan (22.54′34.8″N, 103.42′04.9″E, 1900–2050m [6,300–6,700ft]) only the *R. nuttallii* element seems to be present.

I use the name *R.* aff. *excellens*, as the type of *R. excellens* is said to differ in the number of stamens (around 15, compared with 8–10) and therefore could be a hybrid of this entity with *R. maddenii*. However, it now appears that the type may not have 15 stamens, or at least not consistently, in which case, *R.* aff. *excellens* reverts to *R. excellens* itself!

There have also been some interesting results from recent research at Edinburgh in the variability of *R. nuttallii*. This has shown that *R. sinonuttallii*, from north-west Yunnan, is sufficiently distinct from typical *R. nuttallii* to justify subspecific status. However, the Vietnamese plants relate not to the north-west Yunnan populations but to the Indian typical form. The Vietnamese plants appear to be hardy with overhead shelter on the south coast.

The Ciliatum group consists of the following: the shrub with large white flowers [12] proves to be *R. lyi*, not *R. leptocladon* as has been circulated, and to match the type from Guizhou province. This is interesting as only a few of the floral associations are with areas to the north, more appearing to be associated with the southern flank of the Sino-Himalayas, e.g. *Hypericum hookerianum*, *Alnus nepalensis* and, as noted, for the *nuttallii*. *R. lyi* occurs at lower elevations than other members of this alliance.

The beautiful yellow-flowered species [15] in which the new flowers are lime green, opening to a good lime-yellow to yellow was, when it first flowered in cultivation, thought to be a new species. It was then found to be identical to *R. nemorosum*, described in 1984 as an epiphyte from southern Yunnan. However, examination at Edinburgh of Dop's type for *R. leptocladon* (especially the leaf scales, as the flowers are poorly preserved) shows the name to belong to this species and not *R. lyi* as Sleumer and later Cullen determined. It also makes *R. nemorosum* a synonym of *R. leptocladon*. *R. leptocladon* really is an excellent yellow-flowered species for our gardens, and should be hardy if carefully sited. It occurs mainly as an epiphyte at the bottom of its range (which is as low as 1,800m [6,000ft]) but with increasing altitude it is more usually terrestrial, occurring up to 3,000m (10,000ft) on Fan Si Pan (see fig. 12).

The plant listed in my 1993 article as *R.* aff. *fleuryi* [13] has been called *R.* aff. *veitchianum* and the current favourite is *R.* aff. *carneum*. I think this is getting closer. There seems to be some variation, possibly two taxa are present. It is found on both Fan Si Pan and Suoi Doi, at around 2,200–2,500m (7,300–8,300ft). Apparently the rabbits in Cornwall consider it a delicacy.

The species listed as '28 Sp Indet' [28] appears to be *R. crenulatum*, fitting the original description by Sleumer. Cullen's description (*Notes from the Royal Botanic Garden Edinburgh*, **39 [1]** p.43) is misleading in describing 'Young shoots loriform setose, the setae persistent', and I suspect it may have been a misreading of notes made in the Paris

herbarium. If it said 'Young shoots puberulent, perulae (bud scales) persistent' it would have been correct. The leaves are toothed, in the manner of a *Pieris* (*P. formosana* is one present on both Suoi Doi and Fan Si Pan), but the capsule is clearly *Rhododendron.* The midrib is raised on the upper part of the leaf (as in the Nuttallii alliance). It is a most distinct species, in a group comprised of many blurred taxa. The flower, which I have not seen, is apparently typical of the group, but from foliage characters I would not place it here! It is more common on Fan Si Pan than I had realized, from 2,400m (8,000ft) to the summit. It mainly occurs in the open from *c.*2,900m (9,500ft) where it is a shrub of less than a metre (3ft), but in the forest it can form a sprawling bush growing 3m (10ft) or so out from cliffs.

The fourth member of this group [16] has been equated with *R. sulfureum* in subsect. Boothia but is now deemed to be *R. valentinianum.* In Vietnam it appears to be restricted to Fan Si Pan from 2,400m (8,000ft) to the summit where it is only found on rocky outcrops, which are commoner on the upper slopes. I have not seen it on Suoi Doi, but I have not actually reached the summit of Suoi Doi (or the slightly higher sister peak above Ban Khoang). The Vietnamese material apparently shows that the variety *oblongifolium* is of little botanical significance.

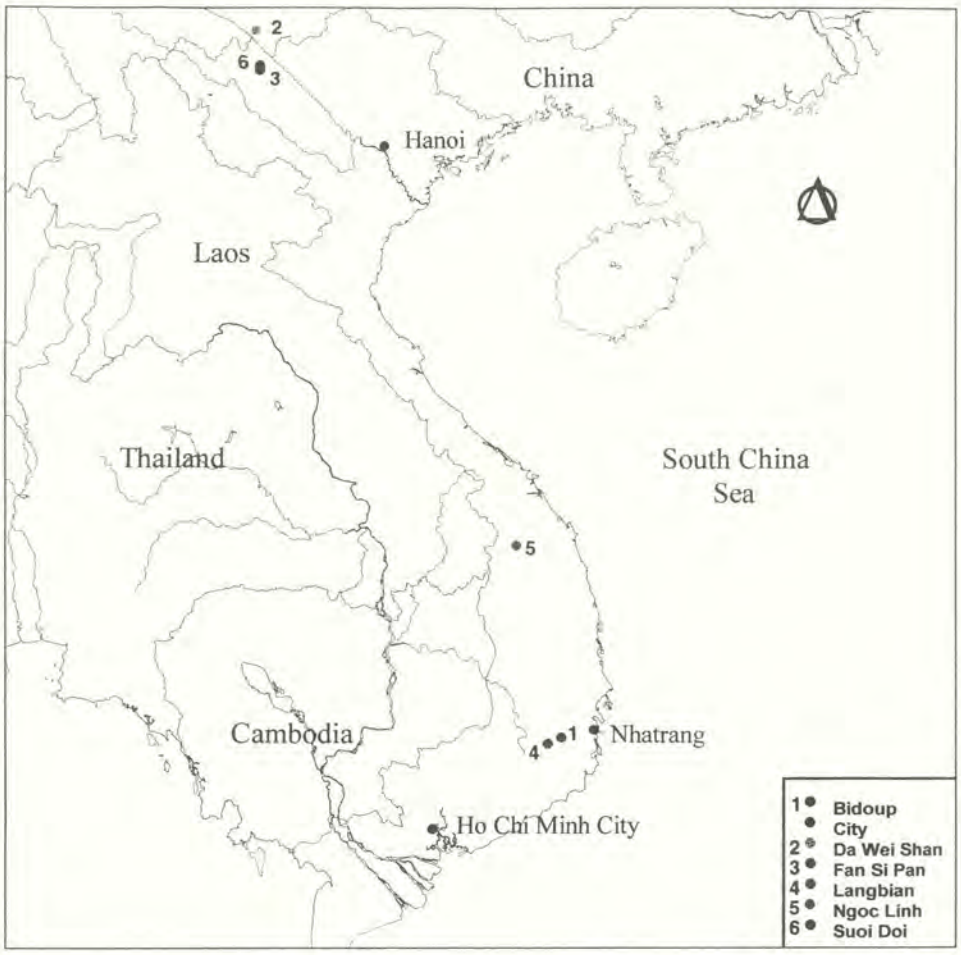
subsect. Tephropepla is more exacting. There are at least two entities present [14 & 18] and possibly a third. On the Ban Khoang road banks there are occasional shrubs to 1.5–2m (5–6ft) with vivid peeling mahogany barks and elliptic leaves brightly silvery glaucous on the underside. These appear to fit *R. xanthostephanum* [14]. Apart from not finding this entity in flower on either of the spring trips, we have also failed to find it in a natural wild setting – the banks by the road to Ban Khoang are not natural features.

On the moss covered bluff (22.22′38.4″N, 103.46′51.8″E at *c.* 2,150m [7,100ft]) which forms a barrier on the east side of Suoi Doi (you ascend by pulling yourself up almost vertically by arm power – the rhododendrons are rooted into about a foot of peat), there are *R. maddenii, R.* aff. *excellens, R.* aff. *delavayi, R.* aff. *carneum* and a *R. tephropeplum* lookalike [18]. I have not seen the last (the *R. tephropeplum* lookalike) in flower but it was found last spring by Tom and Jo Hudson. It has broader leaves than the *R. xanthostephanum* found lower down the slope and pink flowers.

The third entity in this section [18 in part] I have seen in flower – it was just coming out in April and was fully out in May 1992, with pale (slightly purplish) pink blooms. It is restricted to the top of Fan Si Pan where it occurs at around 3,000m (10,000ft) with *R. valentinianum* at 22.18′29.0″N, 103.46′32.9″E. It has smaller leaves than either of the other two taxa.

It is possible that the two pinkish flowered entities are the same, with the observed differences being due to the lusher growing conditions on Suoi Doi.

Rhododendron moulmainense [27] is common on the lower slopes of Fan Si Pan, Suoi Doi and also beside the Phong Tho road. In some forms the new growth is beautifully reddish. In flower it is normally pinky purple but nearly white plants were seen. In 1992 we were too late to see it in flower, and



Map showing the location of the Vietnamese mountains visited in 1997

of course in 1991 and 1994 we were there in the autumn. Out of flower the leaves can look quite similar to some subsect. Irrorata taxa, although in the separate subgenus Azaleastrum. We were not prepared, therefore, for some of the trees on Fan Si Pan which were emergents in the tropical montane rain forest – trees 25m (80ft) with bole diameters to 0.6m (2ft) – and competing with the species of *Lithocarpus* (tan oaks), *Elaeocarpus* and *Huodendron*. (This last is a member of the *Styrax* family with bark like burnished bronze, except the bark on the roots is similar and the surface roots may extend or erupt 15m [50ft] or more from the parent tree. Absolutely enchanting.) However much we pinched ourselves, the flowers both on the trees and fallen on the ground were

rhododendron! Also in the Azaleastrum group is *R. ovatum* [22] which I have only seen on Fan Si Pan as mentioned in the 1993 account.

The Tsutsusi azaleas present in the area include three species: *R. saxicolum* [20] (see fig. 10) is widespread at around 2,000m (6,500ft) and I have also seen it on Dawei Shan near Pingbian in southern Yunnan. [21] is an unidentified or perhaps unattributed species. It is known only from a narrow band on Fan Si Pan at around 2,500m (8,300ft) although with succeeding trips as I get my eye in I find the band is wider! It makes a shrub 3–4m (10–12ft) in height in the forest, with pink flowers and small leaves. The third entity [19] is the plant previously listed as *R.* aff. *microphyton*, to which David Chamberlain says it is only hazily related and is probably closer to *R. chunii* from Guangdong province of China. In 1994 we spent a full morning searching the ridge above Sin Chay for the plants found in 1992, but such searching was unnecessary in 1997 – the ridge had been burnt in 1995 and was almost bare. (It was originally burnt around the time of the Chinese invasion in 1978/79.) A small plant was found growing in the garden of a shop on the outskirts of Ban Khoang (22.24′28.6″N, 103.47′20.9″E) which seems to be this taxon. The proud cultivator of this plant reported that it had been collected from the hillside above and to the north-west of the village. This species is the only one listed here which, as far as I am aware, is not in cultivation, either from my trips, Alan Clark's trip in autumn 1992 or a collecting trip Tran Van On made for me in autumn 1993.

There appear to be four subsect. Pseudovireya taxa present. *R. poilanei* [23] and *R. sororium* [24] are quite common, both on rocks and as ephiphytes or on logs, occurring up to *c.* 2,400m (8,000ft) on Fan Si Pan. The relationship of these two species with the Chinese *R. emarginatum* needs further investigation, and it may be that *R. sororium* will become a synonym of *R. emarginatum*. *R. densifolium* [25] appears to fit the small cuneate-leafed or elliptic-leafed entity but was only found on a few fallen logs on Suoi Doi and earlier on the Ban Khoang roadside bank. The fourth species, *R. rushforthii* [26], has only been found on the Ban Khoang roadside bank, but probably occurs as an epiphyte in trees above. It is almost attractive when in full flower and the steely blue leaves are curious. It is not related to the above three species, but has affinities with *R. kawakamii* from Taiwan. It has been untroubled in pots outside in Fareham and appears quite hardy.

Acknowledgements

I would like to thank David Chamberlain for further comments on the second part of this article and repeat the general acknowledgements given in Part 1.

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Raising Rhododendrons From Seed

E G Millais

At no time since before the last war when George Forrest, Frank Kingdon-Ward and Joseph Rock's introductions were at their peak, has so much seed of real merit become available to rhododendron growers.

Recent expeditions to the Himalayas have produced seed from new areas not fully covered by the well-known plant collectors, and in some cases seed has been collected from species which have died out in cultivation. A quick look through the new collectors' numbers recently published in *The Rhododendron Handbook 1998* will show the huge influx of new seeds which are becoming available. It is vitally important that maximum use is made of this, so that none is wasted, and no-one should be afraid of making an attempt to raise a few seedlings for themselves or their friends. The Rhododendron Group of the RHS, produces a very fine list of seeds which are available every year, and much new seed finds its way to America where the American Rhododendron Society (ARS) also produce a first class list of species and hybrid crosses.

Those who have taken the ARS magazine over the years will have read many accounts by individuals on how to grow rhododendron seedlings. Probably they all work, as it is possible to go about this in many different ways. What follows is a method which suits our nursery and produces good results but those following it must improvise if some of the equipment we use is not available to them.

Sow the seed as early as possible, mid-December is not too early if artificial lighting is available, but in any case not later than mid March. If seed arrives later than this it is better to put it in the fridge until the following season as summer temperatures and growing conditions are not kind to very small rhododendron seedlings.

Artificial lighting is a great help early in the year when light levels are low. Total lighting by natural and artificial means for up to 16 hours per day is beneficial. The artificial light, controlled by a time switch, can be supplied by a strip light fitted with a Grolux tube, but even an ordinary 60 watt bulb will make a difference on a small scale.

The main object of early sowing is to obtain as large a plant as possible to survive the following winter. There are other reasons. Moss, liverwort and general slime will develop more rapidly in the late spring, and it is a good idea to have completed the pricking out stage before these hazards put in too much of an appearance. Liverwort can be overcome, but pricking out seedlings which

are bound together by moss is almost impossible without damaging the roots.

We sow into Stewart half size seed trays 22 × 16 × 5cm (8¾ × 6¼ × 2in) fitted with a clear plastic cover about 12cm (4¾in) high. Shallower 5cm (2in) covers seem to attract too much condensation, and there is no room for plant labels. As the 22 × 16cm (8¾ × 6¼in) seed trays will be capable of holding up to 300 seedlings, divide each tray into three or four compartments, using plant labels to mark the boundaries (see fig. 13). The container with its seeds, must be covered during germination, and for up to a month afterwards.

The peat compost used for seed sowing is vitally important. Most so-called ericaceous composts sold in garden centres are far too fine and dark. It is better to use peat from the upper strata of a peat bog which, by the time it is sold, is usually light brown, and if a few heather seeds germinate with your rhododendron seeds it shows it comes from the right place. We buy medium grade peat and put it through a 10mm (½in) sieve. This is quite fine enough and the particles remaining are sufficiently large to ensure good drainage. I have never used chopped spaghnum moss which can smother the rhododendron seedlings.

After sieving the compost it is watered with a standard mixture of Miracid taking care not to get it too wet, as it will receive further watering later. At this stage no further fertilizers are used.

The compost is now ready to be placed in seed trays. It is most important not to firm it too much and there should be plenty of interstices (air spaces) left after it has been very lightly firmed and levelled. There are two reasons for this: the drainage will be improved and, when the time comes for pricking out, the seedlings will pull apart easily with a minimum of root damage. Rhododendron seeds are sown on the surface, and if this is too level, or compacted, the seed radicles will tend to wander about on the surface and not get down into the compost where they should be. If the humidity is then insufficiently high they can dry off and die.

If rhododendron seed has been properly stored at just above freezing, it will germinate like mustard and cress, so it must be sown evenly and thinly. First empty the seeds from the packet on to a small sheet of paper, and gradually release them from this on to the compost so it is easy to see at what rate they are leaving the paper. Obviously this must not be done in even the slightest draught. Do not necessarily use all the seed in a packet. Use only what you require and put the rest back in storage for another year, or in case of a real disaster!

The seeds are now watered in with Miracid solution, using a very fine rose. The watering process will settle the seeds in the compost, and drive at least some of them into its interstices. Plastic covers are now put on the trays, or alternatively they can be placed in a plastic bag or covered with glass. Place the trays in the greenhouse, out of direct sunlight at a temperature of between 17–21°C (63–70°F). This is best achieved by being placed on a bed heated by thermostatically controlled electric cable, or by small bore hot water pipes, but normal air heating is sufficient. Lower temperatures are acceptable, but will delay germination.

Rhododendron seeds vary in the time

taken to germinate. The Fortunei subsection are the quickest and usually start within a fortnight, while some, like *R. mallotum* and *R. flinckii*, will take up to a month. The older the seed the longer it takes to germinate.

From the time of sowing it is absolutely vital that the surface of the compost does not dry out, and once germination starts spray the seed every two or three days to maintain a high humidity. We use an ordinary hand sprayer which can be obtained from any garden centre for this purpose, and continue for about a month. We use boiled water which has cooled, which we believe delays moss and liverwort formation and maintains a more sterile environment.

About three weeks to a month after germination the first true leaves start to appear on the seedlings. The covers can be opened a crack to start hardening them off and after a week they can be removed altogether. A certain amount of discretion is required, and seedlings of dwarf rhododendrons, which can be tiny, should not have the covers removed until they look well established.

At about this time you may well find that sciarid flies hatch and become a problem. They can be very active on the surface of the seed bed, laying many eggs which produce hundreds of tiny larvae which feed on the roots of rhododendron seedlings. A bad attack can kill off every seedling. On a very small scale it may be possible to control the flies with sticky paper. We use a professional chemical which is not available on the retail market. However, in 1998 Levingtons produced a compost containing Intercept which controls the larvae of both sciarid flies and vine weevils, which may be helpful. Alternatively nematodes are available by mail order from garden centres for controlling both pests. These are very effective at the right temperature, and avoid the use of pesticides.

Once the covers are removed we try and reduce the amount of overhead watering to a minimum. If it must be done it should be in the morning, so that foliage is not left damp overnight, which could encourage botrytis. We recommend keeping the seed trays on moist capillary matting. By watering the matting only, the seed trays will be kept damp enough on all but the brightest days.

The fertilizer present in the original compost may be sufficient to last until the rhododendron seedlings are pricked out, but extra liquid fertilizer can be given at half the minimum recommended rate about once a fortnight, from six weeks after germination.

Prick out as soon as the first two true leaves of the seedlings can be handled easily, and before the roots have become so intertwined that they are difficult to pull apart. Module trays each containing anything from 50 to 100 separate compartments are ideal (see fig. 14). We use cells of 3.5 × 3.5cm (1½ × 1½in) which can be obtained from garden centres. This enables the seedlings to be potted on later with absolutely no root disturbance.

The compost for these trays is different. and contains 30 per cent fine potting bark (e.g. fine Cambark) which produces better rooting than 100 per cent peat. At this stage we use a professional mini-granule, slow-release fertilizer, but if this is not available it would be better to continue with low rate liquid fertilizer every two or three weeks, bearing in mind that if the tips of the leaves start going black or brown, you have been overdoing it, and it would be advisable to

wash out the excess fertilizer by heavy watering with plain water.

Another point to remember is that *R. repens* and its allies simply will not take any fertilizer at all after the pricking out stage. Similarly, special care is needed with all subsections Thomsonia and Taliensia seedlings.

Pricking out can be difficult if the seedlings have been left too long in the seed trays. It helps to ensure that the roots of the seedlings go straight down into the module compartments if some compost from the seed trays remains attached to each seedling as this gives some weight to the roots. At this stage the seedlings can be slightly deeper than when in the seed tray, and should only be lightly firmed before watering them in. Then any which have fallen over should be gently pushed upright.

At 17°–21°C (63–70°F) the seedlings will grow away rapidly during the summer. Temperatures of 40°C (104°F) will not affect seedlings in the modules as long as this is only for short periods and they are kept well shaded. Continuous high temperatures can cause the slow-release fertilizer to release nitrogen too rapidly, and if there is any danger of this, or if the tips start going brown, excess fertilizer should be washed out with heavy watering.

By far the biggest hazards during the summer are botrytis and similar diseases. We use professional fungicides, but can recommend Dithane or Tumbleblight. As it is difficult to spray the undersides of leaves when they are lying on top of the compost, use a pair of nail scissors to cut off the diseased part of any foliage as soon as this appears.

subsect. Triflora and azaleas will grow very rapidly under these conditions, and by midsummer may well have grown up to 20cm (8in), with the foliage so dense that it invites disease. To combat this, and to produce a really bushy plant, you must harden your heart and cut the single stems back to 3cm (1½in). This will produce a multi-stemmed bushy plant very quickly.

From late September onwards all liquid fertilizer application should stop, and only resume when growth starts in early spring, just before they are potted on. We usually delay the cutting back process on most other rhododendrons until the following spring, when the seedlings are moved out of the modules into 9cm (3½in) square or half litre (17½ fl oz) round pots (see fig. 15), and into a standard potting compost containing slow release fertilizer. They are allowed to make up to 10cm (4in) new growth, and if this is a single stem it is cut back and will be replaced by three or four new stems which develop very rapidly. subsections Grandia and Falconera plants are not treated in this way as a short single stem usually seems desirable for these plants. subsect. Fortunea seedlings tend only to produce a single replacement stem if cut too early and for these seedlings it is essential that they are growing very strongly before being cut back.

Azaleas and dwarf rhododendrons will flower quite easily in three years, and others in five or six years. You will find that raising your own seedlings will give immense pleasure, and it is comparatively easy to produce a large number of valuable plants.

E G Millais *owns Millais Nurseries, Crosswater Farm, Churt, Farnham, Surrey and has travelled widely looking for rhododendrons in Sino Himalaya*

Hardy Ghent Azalea National Collection

Nigel Davis

The National Trust at Sheffield Park Garden obtained National Collection status for its collection of Hardy Ghent Azaleas in the early 1980s. This collection had been built up over a number of years by my predecessor Archie Skinner. On his retirement the collection remained with the National Trust and I, as incoming Head Gardener, took over its custody.

The collection of some 33 cultivars of Hardy Ghent Azaleas is sited on a sloping south-east facing site, with slight shade from mature scots pine. The soil is heavy and moisture retentive, acidic in nature (pH 5.5). The collection as inherited included the following cultivars:

'Altaclarense'
'Bijou des Amateurs'
'Bouquet de Flore'
'Charlemagne'
'Coccineum Speciosum'
'Coccineum Major'
'Cuprea Aurantia'
'Daviesii'
'Decus Hortorum'
'Delicata'
'Director Charles Baumann'
'Emile'
'Fanny'
'General Trauff'
'Gloria Mundi'
'Grandeur Triomphante'
'Ignea Nova'
'Josephine Klinger'
'La Surprise'
'Madame Gustave Guillemont'
'Narcissiflora'
'Nivalis Striata'
'Oscar I'
'Pallas'
'Prince Henri de Pays-Bas'
'Raphael de Smet'
'Rouge Brique'
'Sang de Gentbrugge'
'Semiramis'
'Sully'
'Unique'
'Versicolor'
'Vulcan'

In the early 1980s several plants were brought to Sheffield Park Garden from the Castle Howard Estate. These plants were descendants from original stock at the

former Sunningdale Nurseries (which in their later catalogues still listed 77 cultivars), and were taken to Castle Howard by the late James Russell. Several cultivars not held in the National Collection are thought to be still growing in the gardens there.

In 1994 a telephone call was received at the garden office from an Albert de Raedt of Belgium requesting information on the National Collection of Ghent Azaleas. This led to a visit from him and some colleagues the following year, and a reciprocal visit to see collections in Belgium. Developing these links with Albert de Raedt stimulated further interest in this group of azaleas (see Albert de Raedt, *Rhododendrons 1998*, p.29). As I carried out further research into its history, it became apparent that their use in planting schemes had been widespread. Gertrude Jekyll in her garden at Munstead Wood used the Ghent Azaleas because of the wide range of flower colour and later flowering period. Similarly, Vita Sackville-West grew a range of Ghent Azaleas in the Moat Walk at Sissinghurst Castle Garden in the late 1940s. These probably originated from Sunningdale Nurseries as she was friends with the young James Russell. Many of those cultivars are to be found in the National Collection.

As the locations of more and more cultivars came to light it soon became apparent that the collection at Sheffield Park Garden could be expanded to take many more plants identified by Albert de Raedt and his colleagues in Belgium. The number of named cultivars located now stands at 138. The latest addition, found in May 1998, is an early Louis van Houtte introduction *c.* 1858 – 'Van Houtte Flore Pleno'. Extra space at Sheffield Park Garden was required to house these additional plants and the ground has now been cleared of poor rhododendrons ready to receive the azaleas as they are collected. No propagation facilities exist within the garden to receive cutting material from other sources, but I have been very fortunate to meet Rhododendron Group member Jim Inskip, who is assembling a wealth of material from a number of sources, including the Sir Harold Hillier Gardens and Arboretum, the Crown Estate at the Savill and Valley Gardens, and sources in Belgium and Germany. This will enable the collection to expand and the aim is to have representative examples of all available cultivars.

The Ghent Azalea is available in a range of colours to suit varied planting schemes. The plants are generally bushy in habit, many with good autumn colour, and their flowering period starts late, at the end of May. They are distinguished by their long tubed, often scented, honeysuckle-like flowers, mostly in the lighter shades of yellow and pink. The whole colour range is from off-white through to red often flushed or shaded another colour. The flowers are single and double.

The largest specimen at Sheffield Park Garden is of 'Fanny' and has reached 2.1 × 2.1m (7 × 7ft). It has fine trusses of large deep strawberry-rose flowers, with an orange suffusion at the base of the top petal and vivid mahogany-red tubes. A difficult colour to place, it is best on its own, although the flowers soften to a pretty rose with age. One of the best azaleas for autumn colour.

One of my personal favourites must be 'Bouquet de Flore', one of the oldest Ghent Azaleas. This flowers in late May/early June,

with large salmon-rose flowers with a paler stripe down each petal and bold orange-yellow flare, deepening at the base.

A recent addition to the collection which I have enjoyed this year is 'Domenico Scassi', raised by Louis van Houtte in 1873. This has flowers of light pink with faint yellow markings on a lighter underside.

A favourite double Ghent, still widely available, is 'Narcissiflora', raised again by Louis van Houtte before 1873. Two rows of soft yellow petals give the flowers a starry effect, and they have the benefit of being sweetly scented.

Of the hotter colours available, the choice must be 'Gloria Mundi' and 'Coccinea Speciosa'. Both have bright orange flowers with a yellow flare, and long protruding stamens. It is often difficult to distinguish between the two, but the flowers of 'Gloria Mundi' have more salmon in the orange, and they fade in bright sunshine. Good autumn foliage is also an added bonus of these cultivars.

I would be pleased to hear from anyone with a collection of Ghent Azaleas growing in their garden so that at Sheffield Park Garden we can continue to increase our knowledge of their use, and also hopefully find cultivars not presently recorded. Our aim is to have representative examples of all the known cultivars in existence, for reference and identification purposes, and to be able to provide propagation material.

NIGEL DAVIS *is the Property Manager of Sheffield Park Garden, East Sussex, owned by the National Trust*

PHOTOGRAPHIC COMPETITION

The Competition this year was won by Mr C F Taylor with his picture of a rhododendron he saw on a visit to Lea Gardens, Derbyshire, called 'Lea Rainbow' (see fig. 22). It is unique to these gardens, and the parentage is not indicated.

Runners-up were Mr J Wilkes Jones' study of a *R. diaprepes* (see fig. 23) which he grew from seed collected in 1981 at Gregynog, Mid Wales, and Mr K Clapp's intriguing picture of a Maddenia rhododendron as it flowered for him this year. He tells us that the seed was collected by Alan Clarke in N Vietnam under the number AC165, and he believes it to be *R. excellens* (see fig. 24) – it retains its leaves for three years and the scales on the young leaves are raspberry red.

I am grateful to this year's entrants for the high quality of their photos. Unfortunately the number of competitors was disappointing. I wonder if this feature has run its course? I will run it once more next year, and let us hope we get a lot of entries for the millenium competition.

The Editor

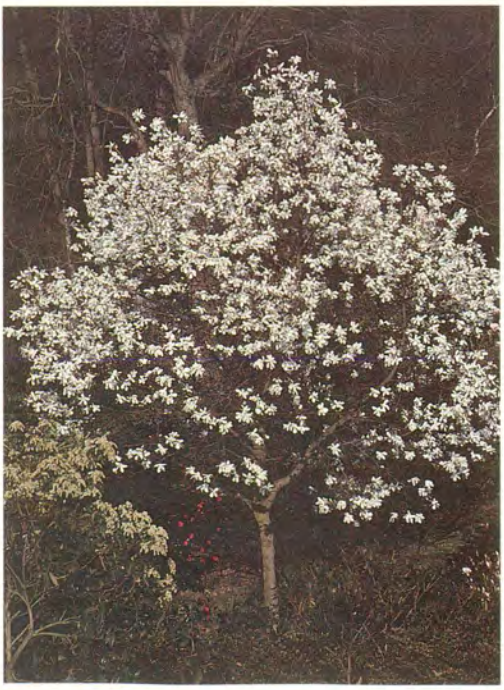


Fig. 1 (top): Magnolia × loebneri *'Ballerina' (see p.11). Fig. 2 (right):* M. × loebneri *'Merrill' at the Punch Bowl, Windsor Great Park (see p.12). Fig. 3 (above):* M. *'Gold Crown' a hybrid from* M. *'Woodsman'* × M. *'Sundance' (see p.42)*

Fig. 4: Overview of dissected countryside from Longzhoushan, nr Huili, Sichuan. Populations of Camellia *species are scattered through the deforested hills (see p.25)*

Fig. 5: Flowers from nine different plants of an unnamed diploid morphologically similar to C. reticulata *(see p.28)*

Fig. 6: The diploid C. tenuivalvis *coming into flower at 3,200m on Longzhoushan (see p.27)*

Fig. 7: Floral variation among eight different plants of the C. pentaphylax, *one of the five white- to pink-flowered tetraploids (see p.31)*

Fig. 8: A naturally occurring double-flowered form of a hexaploid C. reticulata *on Xi Zi mountain near Kunming (see p.31)*

Fig. 9: The flower of C. brevigyna, *one of the 13 red-flowering tetraploid species (see p.28)*

Fig. 10: Rhododendron saxicolum, *one of the three Tsutsusi azaleas present in the northern areas of Vietnam visited by Keith Rushforth (see p.17)*

Fig. 11: Vietnam - a new taxon described, seen on Sui Doi (see p.13)

Fig. 12: R. leptocladon *(syn.* R. nemerosum*) on Fan Si Pan (see p.14)*

Camellias of the Upper Jinsha Jiang (Yangtze) of Yunnan and Sichuan, China

Clifford R Parks and Tiao-jiang Xiao

The region of the upper Yangtze River valley in northern Yunnan and southern Sichuan has a rich diversity of *Camellia* populations. The region is highly dissected by steep, high ridges and deep valleys with elevation changes of up to 2,000m (6,500ft) over short horizontal distances. Stands of *Camellia* are found from 1,200m (4,000ft) in low dry valleys up to 3,200m (10,500ft) on high, mesic slopes. The countryside from Longzhoushan near Huili, Sichuan, is typical of *Camellia* habitats in the upper Jinsha Jiang region (see fig. 4). Species belonging to several sections of the genus *Camellia* are found in this region, but the most common are those from a closely related taxa complex that belongs to *Camellia* sect. *Camellia*. The spectacular cultivars of *C. reticulata* from Kunming were developed over centuries through cultivation in monastery gardens, by accidental recombination or as a result of deliberate breeding. In recent years further taxonomic exploration of this mountainous region has uncovered many variant populations of the plants of sect. *Camellia*, related to *C. reticulata*, and many of these have been given specific names. We will refer to this cluster of closely related taxa as the *C. reticulata* complex. Our purpose in this article is to characterize and show the distribution of this complex. A taxonomic reconsideration will have to wait for additional field and laboratory analysis.

The recognition of this extreme diversity in the upper Jinsha Jiang valley is quite recent. In his monograph of the genus *Camellia*, Sealy (1958) lists only two naturally occurring species of sect. *Camellia* in Sichuan and four in Yunnan. While Sealy refers to the high level of variability and difficulties in identification of species of sect. *Camellia* in these two provinces, and also to the long period of cultivation of members of sect. *Camellia*, he does not refer to the possibility of a large number of additional closely related taxa. The distribution of the four major species of sect. *Camellia* according to Sealy, including the two close relatives of *C. reticulata*, *C. pitardii* and *C. saluenensis*, is shown in Map 1. Sealy (1958) recognized three additional species (and an intermediate species *C. heterophylla*, of

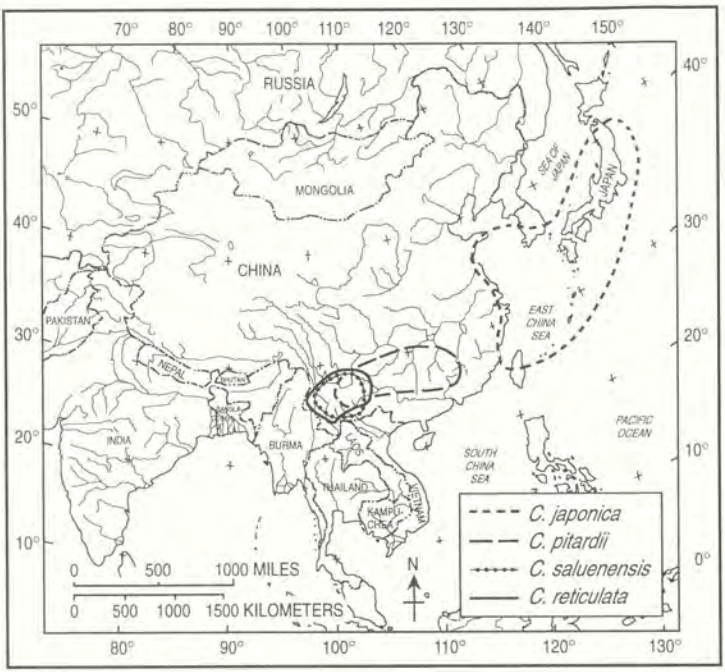
putative hybrid origin, reviewed by Parks and Griffiths, 1963) in sect. *Camellia*, but the three were not available outside of China at the time he wrote his monograph. When Dr H T Chang wrote his monograph in 1981 (Chang and Bartholomew, 1984), he listed about 35 species in the section. Since 1981 at least 30 more species have been named mostly by Dr Chang and his co-workers. Many of the Chang species are described from collections taken from a single site, so their localities will appear as only points on a map.

The 'reticulata complex' is easiest to comprehend if we start with Sealy's concept of the west China camellias of sect. *Camellia*. He recognized four species of this section in Yunnan, two of them having distributions extending into Sichuan (in addition, *C. japonica* and *C. heterophylla* are cultivated). Among the naturally occurring species, the hexaploid, *C. mairei* is physically removed from the others, and occurs in south-eastern Yunnan near Vietnam. It is red-flowered and superficially similar to some tetraploid populations in southern Sichuan, but a detailed analysis of the Sichuan taxa has yet to be done, so the possible relationship of *C. mairei* to the superficially similar Sichuan plants is uncertain. The diploid taxon, *C. pitardii* var. *pitardii*, is widely distributed from south-eastern Yunnan to Hunan and south-eastern Sichuan, and does not overlap (according to Sealy, 1958) the more westerly distribution of the diploid species, *C. saluenensis*. The hexaploid, *C. pitardii* var. *yunnanica*, barely overlaps the distribution of *C. pitardii* var. *pitardii* at the south-eastern edge of its range, but strongly overlaps the range of *C. saluenensis*. While Sealy only had specimens of *C. reticulata* from a small area in western Yunnan, recent field work has shown this taxon to be widely distributed (see Map 1).

The distribution of chromosome numbers throughout sect. *Camellia* provides an interesting pattern that may ultimately lead to the understanding of this western China population complex. T J Xiao, *et al.* (1996) reported the chromosome numbers of a wide range of populations and species in sect. *Camellia*, including all of the new Chang species. The results of his counts are included in the tabulation of species characteristics here. Xiao and his co-workers found diploid, tetraploid and hexaploid counts among the species in this complex, and the distribution of these counts is presented in Map 3 which is redrawn from Xiao's 1996 paper. Note that from south-central China to Japan the species are exclusively diploid, while the tetraploids are mostly restricted to the recently named species in southern Sichuan. The hexaploids occur further south in Yunnan, but some diploids already mentioned occur in the western end of the range. Two recently discovered diploids, a plant morphologically like *C. reticulata* in both northern Yunnan and southern Sichuan and an additional high elevation plant in southern Sichuan, occur with the polyploids. The overall distribution of chromosome numbers is interesting and significant.

Twenty-one of the species recently named by Chang, 1989, and Liu *et al.*, 1991, will be included in this discussion. All of these bear some similarities to the four species discussed by Sealy, *C. mairei*, *C. reticulata*, *C. pitardii* and *C. saluenensis*. In the effort to sort the large number of named

species included in this discussion, we will group them by chromosome number and geographical proximity of occurrence.



Map 1

Diploid Species

The well known diploids, *C. pitardii* and *C. saluenensis*, are very similar, and some years ago Parks and Griffiths (1963) concluded that these two are variants of one wide-ranging, polymorphic taxon. The more extensively collected *C. saluenensis* is extremely variable in vegetative and floral morphology and flower colour, and perhaps *C. pitardii* var. *pitardii* represents eastern populations of this same species. We are not prepared to state whether these two are distinct species without further morphological and laboratory analysis of natural population samples. Both are abundant, and their combined range extends from south-east central China westward to Burma. *C. saluenensis* tends to occur in dryer, open sites, while *C. pitardii* var. *pitardii* is found more frequently under forest canopy often near streams. The major morphological characteristics as determined by Sealy (1958) or Chang (1989) of the diploid species included in this study are tabulated in Table 1 (following p.33).

The high elevation diploid from southern Sichuan which is described from only Longzhoushan at elevations of up to 3,200m (10,500ft), has some superficial similarities with the diploids described above (see fig. 6). Chang saw it only from dried specimens and described it as red-flowered. In fact the flower colours are apple blossom shades similar to *C. saluenensis*. Both plant height and leaves are larger than *C. saluenensis*, and it has a general appearance more like the coarser hexaploid *C. pitardii* var. *yunnanica* than the finer-textured *C. saluenensis*. It occurs in a very mesic, high habitat – either in very exposed sites or under forest canopy. If not attacked by the axe, it becomes quite a large tree. We saw *C. tenuivalvis* growing in an exposed meadow with rhododendron, but it also occurs as a rather large tree at the edge of a woodland on the other side of the ridge. It is probably widespread at high elevations in the mountains of northern Yunnan and southern Sichuan.

In 1994 *C. reticulata* complex populations were observed to be common in woodlands on Jizushan (Chicken Foot Mountain) in northern Yunnan from 2,000 to 3,000m (6,500–10,000ft). Although one of us, Parks, was not aware of *C. tenuivalvis* at that time, the *Camellia* plants on the summit area in both woodland and exposed sites were like those on Longzhoushan and were almost certainly the same taxon. Probably this *Camellia* species is common on mountains in that area *c.* 3,000m (10,000ft). This species is important for cold-hardiness breeding for Europe because it is adapted to cold winters and cool summers. The plants coming into bloom in figure 6 were opening flowers after nights that we estimated to be far below freezing.

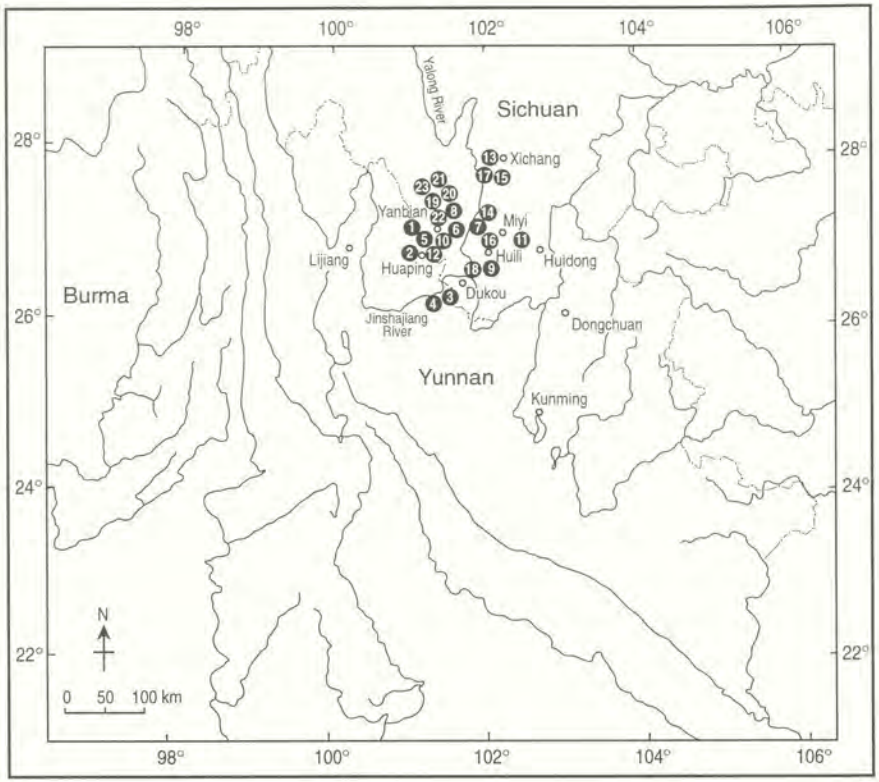
Another diploid is known from two populations, one in northern Yunnan and another in adjacent Sichuan. This diploid is particularly problematic because it is morphologically similar to hexaploid *C. reticulata*, but has a diploid chromosome number. It was discovered by Xia, *et al.* (1994) but has not been given a taxonomic designation. The foliage of the individual plants in the diploid populations is morphologically variable, but is often similar in appearance to that of the hexaploid forms. Figure 5 shows flowers collected from a natural population; each flower in the photograph was taken from a different plant. Note the general similarity of the flowers to those of *C. reticulata* f. *simplex*; however, when grown in a greenhouse with hexaploid *C. reticulata*, the flowers of the diploid individuals looked somewhat distinct. Also, the colour is closer to that of the red tetraploids, not the wild hexaploid (compare fig. 5 to that of *C. brevigyna*, fig. 9). Consideration of morphology and flower colour suggests that some differences occur between the diploid and polyploid populations of *C. reticulata*.

In Yunnan other diploid species have been named and placed in sect. *Camellia*. These species are generally similar to *C. pitardii* var. *pitardii* and *C. saluenensis*. Since we do not have specimens or detailed descriptions available, these taxa will be omitted from this discussion.

Tetraploid Species

Sixteen of the species recently named by Chang (1989) and Liu, *et al.* (1991) discussed here are tetraploid, and one additional species which cannot be precisely located has never been available for a chromosome count. The species descriptions are brief, and some morphological characters are missing in the descriptions. We have not been able to locate published keys. Most of these species are only known from single populations, and additional field work will undoubtedly extend their ranges because *Camellia* populations are generally common in the Jinsha river valley. These taxa occur in populations with either red flowers or apple blossom shades. As a means of separating this large number of taxa, we will discuss the species with red flowers first and those with shades of pink flowers afterwards.

The true red flower colour in wild populations in the *C. reticulata* complex is restricted to 13 of these tetraploid taxa. However, the species description does not fully differentiate (since they were described from dried specimens) between true red and the rose colour of wild *C. reticulata*. The locality where each of these species was



Map 2

1 = *Diploid morphologically similar to* C. reticulata *in Yanbian, Sichuan (2n = 30);*
2 = *Diploid morphologically similar to* C. reticulata *in Huaping, Yunnan (2n = 30);*
3 = C. jinshajiangica *in Xiaobaoding, Dukou, hexaploid (2n = 90);*
4 = C. albosericea *in Xiaoboading, Dukou, hexaploid (2n = 90);*
5 = C. lanosituba *in Wale, Yanbian, tetraploid (2n = 60);*
6 = C. brevigyna *in Hujiawan, Yanbian, tetraploid (2n = 60);*
7 = C. brevipetiolata *in Tangjie, Miyi, tetraploid (2n = 60);*
8 = C. chunii *in Hujiawan, Yanbian, tetraploid (2n = 60);*
9 = C. huiliensis *in Fenghe, Huili, tetraploid (2n = 60);*
10 = C. minor *in Qingganban, Yanbian, tetraploid (2n = 60);*
11 = C. oligophlebia *in Puwei, Miyi, tetraploid (2n = 60);*
12 = C. pentapetala *in Yanbian, unknown chromosome number;*
13 = C. pentaphylax *in Luojishan, Xichang, tetraploid (2n = 60);*
14 = C. pentaphylacoides *in Longshuguo, Miyi, tetraploid (2n = 60);*
15 = C. stichoclada *in Luojishan, Xichang, tetraploid (2n = 60);*
16 = C. tenuivalvis *in Longzhoushan, Huili, diploid (2n = 30);*
17 = C. xichangensis *in Luojishan, Xichang, tetraploid (2n = 60);*
18 = C. subliberopetala *in Huili-Dukou border, hexaploid (2n = 90);*
19 = C. phelloderma *in Dahuoshan, Guosheng, Yanbian, tetraploid (2n = 60);*
20 = C. bailinshanica *in Dongbawan, Guosheng, Yanbian, tetraploid (2n = 60);*
21 = C bambusifolia *in Dahua, Guosheng, Yanbian, tetraploid (2n = 60);*
22 = C. kangdianica *in Yangzhuchang, Guosheng, Yanbian, tetraploid (2n = 60);*
23 = C. brevicolumna *in Dabi, Guosheng, Yanbian, tetraploid (2n = 60).*

collected is marked on Map 2. These localities all occur in southern Sichuan, and some are located very close to each other, even on the same mountain. The possibility exists that the search for more populations in this area will identify intermediate forms that variously bridge these taxa and merge them into larger polymorphic taxa. Tables 2a-2d (following p.33) list these species and the morphological characters used by Chang (1989) and Liu, *et al.* (1991) to characterize them. Dr Barbara Thakor, working in our laboratory, has found that most of the morphological traits used to characterize these species are polymorphic in many other camellia species. Dr Thakor studied 66 floral and vegetative characters many of which were found to be polymorphic in most of the 26 camellia species comprising her study group. At this time we do not have additional morphological or molecular data that could be used to further characterize these 13 taxa or support any opinions we might have on their validity. Our objective here is to define this complex system as well as we can to provide a basis for further work. Both of us have made collections from many of these species from the wild state, and these accessions, which are now established in our germplasm collection, are just beginning to provide leaves and flowers for further investigation.

In order to compare these taxa, we have tabulated their traits in geographical groupings. Table 2a (following p.33) lists and describes five species from a mountain adjacent to the village of Guosheng, Yanbian County, in southern Sichuan. These species are so similar that it is doubtful they could be distinguished in a mixed planting. Of the five, only *C. bambusifolia* with narrower leaves and white hairs on the petals seems recognizable. *C. bailinshanica* and *C. brevicolumna* were both growing in species collections at Mr Bob Cherry's Paradise Nursery in Kulnura, Australia, and the two species looked essentially the same. On the basis of their descriptions, it seems these five taxa are not separate species, but it will be necessary to return to Guosheng and take field measurements of a range of morphological traits to determine if these five taxa retain morphological integrity or merge into more variable taxa with a broader distribution.

Table 2b (following p.33) similarly lists six species named from populations in other parts of Yanbian County where the maximum distance between populations is perhaps up to 50 km (31 miles). *C. brevigyna* has coarser foliage and large bright red flowers, while *C. minor* has smaller leaves and flowers and a paler red flower colour. Figure 9 displays a solitary bloom of *C. brevigyna*. *C. chunii* was described as having red flowers, but the flower colour is actually rose-pink. The group of six taxa described in Table 2b is more variable than the group of five species from Guosheng, but the distinctness of these taxa is questionable. Two additional red-flowered taxa were named from Miyi County, and are described in Table 2c (following p.33). These seem broadly similar to the taxa in Tables 2a and 2b, but they have not been available to us for observation yet. Seedling samples from most of the species included in the three tables were collected by Xiao in the autumn of 1996, and these plants will soon flower and provide material for further comparison as well as laboratory analysis.

A second group of five tetraploid species is described in Table 2d (following p.33). This group is characterized by pink to white flowers in mixed stands, but otherwise these taxa are similar to the red tetraploids. The appearance of these pink-flowered taxa in the field is much the same as the pink- to white-flowered populations of the hexaploid, *C. pitardii* var. *yunnanica*, in northern Yunnan. The variation in flower colours and the appearance of the plants and flowers is highly similar. In 1996 we briefly visited flowering populations of *C. huiliensis*, *C. boreleayunnanica*, *C. pentaphylax* and *C. xichangensis*. *C. huiliensis* was particularly variable in flower. The flowers of all four species were similar, but the individual plants of *C. boreleayunnanica* and *C. pentaphylax* (see fig. 7) were vigorous and growing in somewhat exposed sites due to forest thinning. Consequently, the bloom was very heavy and particularly showy. *C. stichoclada* differs from *C. pentaphylax* primarily in its white flower colour. There is no obvious reason to separate the populations of white- to pink-flowered tetraploids into separate species: in fact, we have not encountered anyone who can identify these to species if they do not know the locality of origin!

Hexaploid Species

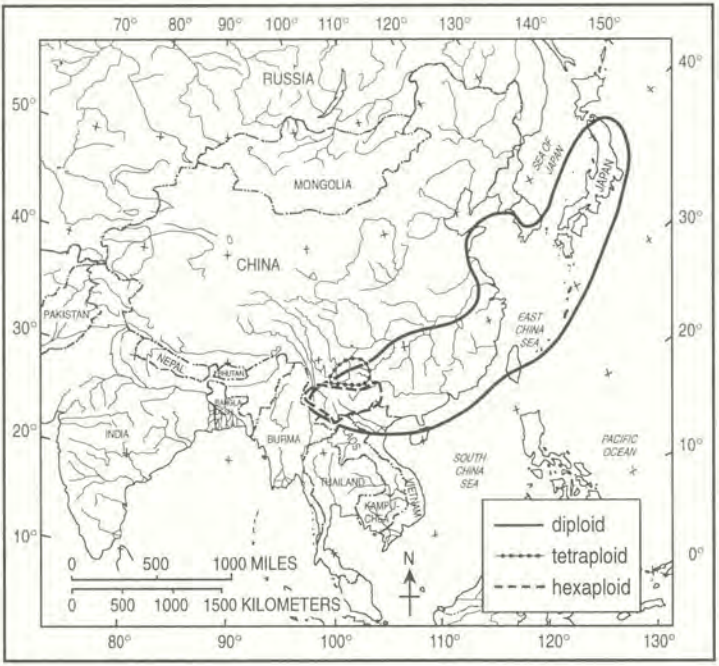
The hexaploid species are summarized in Table 3 (following p.33). This group includes three recently named taxa, and two widely distributed species in Yunnan. The best-known species of this grouping is *C. reticulata*, which was first known from cultivated forms. Sealy (1958) introduced a form, *C. reticulata* f. *simplex*, to describe the wild type collections of *C. reticulata*. The distribution of the wild forms is indicated in Map 1 (see p.27). Note that the distribution overlaps the western end of the range of *C. pitardii*, which in the western part of the range is the hexaploid variety, *C. pitardii* var. *yunnanica*. The two hexaploid taxa are similar except that the wild forms of *C. reticulata* tend to have larger leaves, flowers and fruits. Individuals of the two taxa are variable for most of the morphological traits. *C. reticulata* populations typically have flowers that are a deep rose-pink, while the many populations of *C. pitardii* var. *yunnanica* have apple blossom flower colours ranging from soft, medium pink to pure white (rare). We have never encountered populations of either of these taxa that have the colour of the other, however, some populations of *C. pitardii* var. *yunnanica* are said to have the deep rose-pink colour.

Pictured in figure 8 is a wild, double-flowered individual from a population of *C. reticulata* growing in a forest preserve on Xi Zi mountain near Kunming. The chance mutations in petal number are undoubtedly the original source of double flowers in cultivated *C. reticulata*. It has been speculated (Parks, 1963) that the wild hexaploid forms of these two taxa represent the highly variable gene pool from which the cultivars of *C. reticulata* were derived. We are doubtful that the hexaploid forms of *C. reticulata* and *C. pitardii* are distinct at the species level, but unlike the recently named species from southern Sichuan, wild *C. reticulata* and *C. pitardii* var. *yunnanica* can be distinguished in the field. It is worth noting that the several tetraploid species in Sichuan with apple blossom flower colours (see Table 2d, for descriptions) look highly similar to the

hexaploid, *C. pitardii*, and display an identical variation in flower colours. However, the 13 tetraploid, red-flowered species recently named in southern Sichuan are set apart in morphology and in the deeper red flower colour from the hexaploids.

Now we need to address the matter of the three hexaploid populations in southern Sichuan named *C. albosericea*, *C. jinshajiangica* and *C. subliberopetala* (see Table 3 following p.33). One of these was growing at Leng Shuei Qing, near Dukou, and we have decided that it is probably *C. jinshajiangica*. It was in fruit when we visited the site in September of 1997, and it had large leaves and fruits that appeared typical of wild *C. reticulata*. Although we cannot make a final determination on the distinctness of these three species, we suggest that they may be nothing more than the northward extension of the range of the hexaploid populations of *C. reticulata*.

In conclusion, because of the very large number of species names applied to the highly variable populations of the *C. reticulata* complex, the taxa will be grouped by chromosome number. The diploids can be grouped into three divisions: (1) the abundant populations of *C. saluenensis* and *C. pitardii* var. *pitardii* that extend from the Burma border to south central China; (2) the two diploid populations of small trees that closely resemble the hexaploid populations of *C. reticulata*; (3) the high elevation populations of *C. tenuivalvis*. The basic *C. saluenensis–C. pitardii* diploid group has been subdivided into many species by now, but in 1963 one of us (Parks [and Griffiths]) thought there should be only one. Clearly no decision is possible without much more field and laboratory research.



Map 3

The tetraploids can be divided into two groupings: (1) the species with apple blossom flower colours that resemble hexaploid *C. pitardii*; (2) the 13 red-flowered species. Although more research is needed before final conclusions are

made, it seems that the five apple blossom flowered populations, currently named as distinct species, are not distinct from each other at the species level, and they represent a single taxon with an unknown relationship to the red-flowered tetraploids. The 13 red-flowered species present a more complex picture. There is a high level of morphological variation both within and between the populations, and major variation in size of floral and foliar organs are common. We are of the opinion that this grouping does not contain 13 distinct species, but it is too soon to speculate on the number of taxa that occur. The tetraploids comprise a diverse group of populations of one to a few polymorphic species.

The hexaploids are made up of one or two variable species.

What is next? One of us,T J Xiao, had studied these plants extensively in China before coming to the US to embark upon graduate study. Currently, he is using the molecular techniques of AFLP and gene sequencing to analyze the Yunnan-Sichuan complex discussed here. Plant materials of the taxa discussed here are available in our germplasm collection. After the taxa are 'sorted' using molecular analysis, we plan to return to China during the flowering season of 1999-2000 to take extensive morphological measurement from several individuals from as many populations as possible, and attempt to correlate the morphological variation with the molecular variation. With this information in hand, taxonomic reconsideration should be possible.

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Tables 1, 2a, 2b, 2c, 2d and 3 follow

Table 1. Morphological traits of diploid(*1) species of *Camellia* sect. *Camellia* in Sichuan and Yunnan

			Foliar Traits				Floral Traits							Fruit
Species (authority)	**Locality**	**Habit**	**Shape**	**Size in mm**	**Petiole length in mm**	**Leaf margin**	**Peduncle**	**No. bracts & sepals, length in mm**	**Petal Colour**	**No. petals, shape, length in mm**	**Stamens length in mm**	**No. locules**	**Styles length in mm**	**Capsule shape, size in mm, wall thickness in mm**
C saluenensis (Sealy, 1958)	widely distributed	shrub 1-5m	oblong or elliptic	L. 25-55 W. 10-22	4-7	denticulate	sessile	____, (*5) glabrous or puberulous, 15-20	white to rose pink	6-7, obovate to ovate, 25-50	12-30, glabrous, base connate	3, densely tomentose	8-20, 3 lobed	subglobose, 25, ____
C pitardii var. *pitardii* (*2) (Sealy, 1958)	widely distributed	shrub or tree to 7m	variously oblong-elliptic	L. 45-120 W. 18-45	5-12	serrulate to serrate	sessile	____, puberulous or glabrous, 13-25	white to rose pink	5-6, variously obovate, 35-55	20-30, mostly glabrous, base connate	3, densely tomentose	16-28, 3 lobed	depressed globose, 35-50, wall thick
C tenuivalvis (Chang H T, 1989)	Longzhou-shan, Huili Co.	shrub to 2m >5m (*3)	lanceolate-oblong	L. 50-70 W. 15-20	5-7	serrulate	sessile	8-9, 9-13, pubescent	red (Chang), apple blossom shades *always* (*3)	7, obovate, 25-30	15, glabrous, base connate	3, 3-5 (*2), pubescent	10, 3-(5) lobed	round 13-22, 1-1.5, (*4)
C. reticulata (diploid) (Xia, L F, *et al.*, 1994)	two populations (one each in Sichuan and Yunnan)	small tree to >5m	leaf size and shape highly variable, often very large				sessile	Flower size variable, rose-red in colour, flowers and foliage strongly resemble hexaploid *C. reticulata* superficially						

(*1) Additional species have been named by Chang which are morphologically similar to *C. saluenensis* and *C. pitardii* var. *pitardii*, but they are omitted from this discussion.
(*2) Sealy could not have known chromosome members for his specimens and some may have been morphologically similar tetraploids or hexaploids.
(*3) Observations by Parks, 1997.
(*4) Important trait particularly characterizes species and may be basis for name.
(*5) Line indicates data missing in species description.

Table 2. **Morphological traits used by Chang (1989) and Liu, *et al.* (1991) to characterize the tetraploid species of *Camellia* sect. *Camellia* from southern Sichuan**

Table 2A. Red-flowered species at Guosheng, Yanbian County

			Foliar Traits				Floral Traits							Fruit
Species	Locality	Habit	Shape	Size in mm	Petiole length in mm	Leaf margin	Peduncle	No. bracts & sepals, length in mm	Petal Colour	No. petals, shape, length in mm	Stamens length in mm	No. locules	Styles length in mm	Capsule shape, size in mm, wall thickness in mm
C. bailinshanica	Guosheng, Yanbian Co.	small tree 2.5m to >5m (*1)	oblong	L. 70-130 W. 18-36	7-10	serrulate	sessile	9-11, 16, pubescent	red	6-7, obovate, 35-40, glabrous	30, glabrous, base connate	3, pubescent	20-30, 3 lobed 5-20	round, 25-65,
C. bambusifolia	Guosheng, Yanbian Co.	small tree to 2m	lanceolate-oblong	L. 45-80 W. 10-12 (*2)	4-7	serrulate	subsessile	8-11, ___, pubescent	red	5-6, sublibera, whitehairs (*2)	13, glabrous, base connate	3, pubescent	___, 3-4 lobed 11	round, 46,
C. brevicolumna	Guosheng, Yanbian Co.	small tree to 5m	elliptic	L. 60-110 W. 40-55	6-9	serrulate	___, (*3)	8-10, 10-15, pubescent	red	8-9, obovate, 20-30, pubescent	___, glabrous, base connate	3-5, pubescent	___, 3-5 lobed 10	round, 60,
C. kangdianica	Guosheng, Yanbian Co.	small tree to 2.2m	oblong, ovate-elliptic	L. 65-100 W. 25-35	7-10	serrulate	___	8-10, ___, pubescent	red	5-7, obvate, 35-40, pubescent	15, pubescent or glabrous, base connate	3, pubescent	20-25, 3 lobed 10	round, 40-60,
C. phelloderma	Guosheng, Yanbian Co.	small tree to 3.5m	lanceolate-oblong	L. 60-120 W. 25-38	6-10	serrulate	subsessile	9-10, 16, pubescent	red	6-7, obcordal, 25-40, pubescent	20, glabrous or pubescent, base connate	3-4, pubescent	25-30, 3-4 lobed	round,. 65-78, 16

(*1) Additional observations by Parks.
(*2) Important trait particularly characterizes species and may be basis for name.
(*3) Line indicates data missing in species description.
(*4) Described by Chang, *et al.* as red, but flower colour actually rose-pink.
(*5) An additional tetraploid species in this group, *C. borileayunnanica*, was named earlier, but measurements are not available. The locality is Honggi Shiniku, Huili Co.
(*6) Red-coloured flowers never observed.

Table 2B. Red-flowered species in other parts of Yanbian County

			Foliar Traits				Floral Traits							Fruit
Species	**Locality**	**Habit**	**Shape**	**Size in mm**	**Petiole length in mm**	**Leaf margin**	**Peduncle**	**No. bracts & sepals, length in mm**	**Petal Colour**	**No. petals, shape, length in mm**	**Stamens length in mm**	**No. locules**	**Styles length in mm**	**Capsule shape, size in mm, wall thickness in mm**
C. brevigyna	Hujia Wan, Yanbian Co.	shrub to 2.5m	oblong to oblong-lanceolate	L. 100-140 W. 30-50	10-12	serrate	sessile	8, 18, pubescent or glabrous	red	7-8, obovate, 30-35,___	30, pubescent, base connate	3, pubescent	15(*2), 3 lobed	round, 40-50, 10-15
C. chunii	Hujia Wan, Yanbian Co.	small tree	ovate (*2)	L. 70-90 W. 30-40	5 (*2)	serrulate	___	10-12, 15, pubescent	red (*4)	7 obovate, 30-35,___	20, glabrous, base connate	4-5, pubescent	15-20, 4-5 lobed	round , 40-50, 10
C brevipetiolata	Tuan-jie Xiang, Yanbian Co.	shrub	ovate-elliptic	L. 60-95 W. 30-50	3-5 (*2)	crenulate	sessile	10-14, 8, pubescent	red	6-7, obovate, 30-40,	25, glabrous, base connate	3, pubescent	23, 3 lobed 2-3	round, 20,
C. minor	Qingqanben, Yanbian Co.	shrub, 1-1.5m, >5m(*3)	oblong	L. 50-75 W. 20-27 (*2)	4-5	serrulate	subsessile	9-10, 12, pubescent	red	5, obovate, 20-25, pubescent	15-20, glabrous, base connate	3-4, pubescent	10-13, 4-5 lobed	round, 20-30, 4-5
C. lanosituba	Wuale, Yanbian Co.	shrub to 2m	oblong	L. 70-90 W. 30-40	10-13	serrate	sessile	9-11, pubescent, 35-40cm, glabrous	red	8-9, obovate, 10, (*2) pubescent, lanose (dense white hairs)	30, pubescent, base connate	3, pubescent 3 lobed	20-30,	round, ____, ____
C. pentapetala	(Unknown) Yanbian Co.	shrub	oblong	L. 70-90 W. 20-40	6-8	serrulate	sessile	8-9, 10-12, pubescent	red	5(*2), obovate 25-30, glabrous	13, glabrous, base connate	3, pubescent	10, 3 lobed	round, 20-25, 8

(*1) Additional observations by Parks.
(*2) Important trait particularly characterizes species and may be basis for name.
(*3) Line indicates data missing in species description.
(*4) Described by Chang, *et al.* as red, but flower colour actually rose-pink.
(*5) An additional tetraploid species in this group, *C. borileayunnanica*, was named earlier, but measurements are not available. The locality is Honggi Shiniku, Huili Co.
(*6) Red-coloured flowers never observed.

Table 2C. Red-flowered species from Miyi County

			Foliar Traits				Floral Traits							Fruit
Species	Locality	Habit	Shape	Size in mm	Petiole length in mm	Leaf margin	Peduncle	No. bracts & sepals, length in mm	Petal Colour	No. petals, shape, length in mm	Stamens length in mm	No. locules	Styles length in mm	Capsule shape, size in mm, wall thickness in mm
C. oligophlebia	Puwei, Sharen ping, Miyi Co.	shrub, 1-1.5m	lanceolate-oblong, veins inconspicuous(*2)	L. 70-100 W. 28-35	10	serrulate	___ 17, pubescent	8-9,	red 30-40, pubescent	5-6, obovate, glabrous, base connate	25-30, pubescent	3-4, 3 lobed	20, 30-40, 5-7	round,
C. pentaphylacoides	Puwei, longshuigou, Miyi Co.	small tree	ovate-lanceolate	L. 60-80 W. 25-32	6-10	serrulate	sessile	7-8, 16, pubescent inside, glabrous out	red	6-7, obcordal, 20-30, ___	20-25, glabrous, base connate	3, pubescent	15, 3 lobed	round, 25-35, 8
Table 2D. Pink- or white-flowered tetraploid species from Huili (*5) and Xichang countries, Sichuan														
C. huiliensis	Fenghe, Huili Co.	shrub, 1-2m	lanceolate	L. 70-100 W. 20-30	5-8	serrulate	sessile	3-4, 20-50, glabrous	pink	6, obcordal, 30-50, ___	20, glabrous, base connate	3, pubescent	10-12, 3 lobed	round, 20-26, 4
C. pentaphylax	Loji-shan, Xichang Co.	shrub to small tree,	ovate-lanceolate 2-3m	L. 70-100 W. 30-40	10	serrulate	sessile	8-10, 12-16, pubescent	red ___, pink to white (*6)	9-10, obcordal 40-45, glabrous in, pubescent out	25, glabrous, base connate	5, pubescent (*2)	15 - 20, 4-5 lobed	round, 40-60, 10
C. stichoclada	Loji-shan, Xichang Co.	shrub to small tree	ovate-elliptic	L. 40-65 W. 25-35	6-8	serrulate	___	8-9, 14, pubescent inside	white (*2)	5-6, obcordal, 25-30, ___	20, glabrous, base connate	3, pubescent	18, 3 lobed	___ 25-30, 6-8
C. xichangensis (*6)	Loji-shan, Xichang Co.	shrub to small tree, 2-3m	oblong	L. 80-115 W. 25-40	10-16	serrulate	sessile	8-9, 15,	white and red ___, white to light pink Parks(*6)	8, obovate, 30-50, ___	30, glabrous, base connate	3-5, pubescent	20-25, 3-5 lobed	round, 40-60, 10

(*1) Additional observations by Parks.
(*2) Important trait particularly characterizes species and may be basis for name.
(*3) Line indicates data missing in species description.
(*4) Described by Chang, *et al.* as red, but flower colour actually rose pink.
(*5) An additional tetraploid species in this group, *C. borileayunnanica*, was named earlier, but measurements are not available. The locality is Honggi Shiniku, Huili Co.
(*6) Red-coloured flowers never observed.

Table 3. Morphological traits of hexaploid species of *Camellia* sect. *Camellia* in Sichuan & Yunnan

			Foliar Traits				Floral Traits							Fruit
Species (authority)	**Locality**	**Habit**	**Shape**	**Size in mm**	**Petiole length in mm**	**Leaf margin**	**Peduncle**	**No. bracts & sepals, length in mm**	**Petal Colour**	**No. petals, shape, length in mm**	**Stamens length in mm**	**No. locules**	**Styles length in mm**	**Capsule shape, size in mm, wall thickness in mm**
C. albosericea	Xiaobao ding, near DuKou	shrub or small tree to 2m	oblong-lanceolate	L. 75-100 W. 30-40	5-6	serrulate	sessile	8-9, 17, pubescent white silky hairs (*1)	red (rose?)	6-7, obovate, 30-35, ___ (*3)	20, glabrous, base connate	3, pubescent	15-20, 3 lobed	round, ___, ___
C jinshajiangica	Xiaoboa ding, near Dukou	shrub to 2m, 5m (*2)	elliptic or ovate-elliptic	L. 90-120 W. 45-63	6-8	serrulate	subsessile	9-10, ___, ___	red (rose?)	6-7, ovate, 25-40, pubescent	20-25, pubescent, base connate	4-5, pubescent, 2-3 (*2)	30, 4-5 lobed	round, 42-77 (*2) 12-19 (*2)
C. sublibero-petala	Huili-Dukou border, near Dukou	shrub to 2m	elliptic	L. 40-90 W. 25-40	5-6	serrulate	sessile	7-8, 14, glabrous	red (rose?)	6, obcordate, 20-35, apice bilobed(* 1)	15-18, glabrous, base connate	3(?), pubescent	13-15, 3 lobed	round, 25-30, 3-4
C. reticulata (Sealy, 1958)	widely distributed	shrub or tree to 15m	broadly elliptic (variable)	L. 75-115 W. 26-56	10-13	serrulate	sessile	___, 20-30, glabrous	rose-red	5-7, obovate, 50-70, (variable)	25, glabrous, base connate	3, pubescent	25-32, 3-4 lobed	oblate, 30-60, 7
C. pitardii var. *yunnanica* (Sealy, 1958)	widely distributed	All characters fall in range of *C. pitardii* var *pitardii* (see Table 1).												
C. mairei (Sealy, 1958)	widely distributed, east & south	medium size tree	elliptic, oblong-elliptic	L. 65-95 W. 17-23	4 - 5	openly serrulate	sessile	___, 15-25, puberulous	bright red	35-40, obovate, ___	30, villose, base connate	3, densely tomentose	20-30, 3 lobed	subglobose, 45, 10

(*1) Important trait particularly characterizes species and may be basis for name.
(*2) Observations by Parks, 1997.
(*3) Line indicates data missing in species description.

Magnolia Improvement

August E Kehr

For the purpose of this article I have divided the improvement of magnolias into three phases.

First Phase

The first phase begins with the introduction into Great Britain in 1790 of two magnolia species from Asia by Sir Joseph Banks, the botanist on Captain Cook's trip around the world, namely, *M. liliiflora* and *M. denudata.* Other species of major importance were not available for hybridizers until nearly half a century later. These two were the essential species for the next phase and their introduction was of great historic importance for the beginning of magnolia improvement.

Second Phase

The second phase occurred in France soon after 1800 with the hybridization of *M. denudata* and *M. liliiflora* by E Soulange-Bodin to start the long era of Soulangeana hybrids. The first Soulangeana hybrids soon spread to all parts of the world and even today are the dominant kind available from average nurserymen and horticulturists. They must be given their credit because it is certain they popularized magnolias to the gardening public.

It was not until about 50 years later that hybrids of other species, such as *M. stellata,* began to appear. It was nearly 100 years later that other Asian species became commonly used as parental material. From the first appearance of the Soulangeana hybrids until the 1940s many fine hybrids were developed, all by the use of additional Asian species. In brief, the second phase could be called the 'Phase of the Asian Species', including *M. stellata* (and its closely related types), *M. sieboldii, M. hypoleuca,* and *M. campbellii,* all introduced shortly after 1860. Thus the second phase was dominated by the Asian species, especially *M. liliiflora* and *M. denudata.*

Third Phase

The third phase, which is still underway, began with the use of North American species in magnolia improvement. Prior to about 1940 all the North American species were grown for their ornamental value, not for use in hybridizing. This third phase began with the use as a parent of *M. acuminata* and its closely related species, *M. cordata.* For the purposes of this article the latter will be considered as a valid species, although it is far less important than *M. acuminata.* Once again, *M. liliiflora* and *M. denudata,* from the second phase, are essential to this phase.

Magnolia acuminata is a pyramidal tree up to 30m (100ft) tall. It is native from southern Ontario to the Florida panhandle, and west to Illinois and Arkansas. It was first

introduced to culture in 1736 by John Bartrum, who sent seed to his friend Peter Collinson in London. It often has a trunk of over 60cm (2ft) in diameter. The flowers are commonly small in size and an insignificant green to greenish yellow; an occasional tree has yellow flowers. Trees with bluish flowers are also known. Some clones, such as 'Klassen', produce offspring that are highly fastigiate, a character that will appear over and over again in the plants developed in this phase, as does the size, especially the height. Persons planting hybrids of this species must realize that their ultimate height can reach proportions close to the parental dimensions. To date few of the hybrids have reached their eventual dimensions, but there are some that are nearly 12m (40ft) high and are still extending skyward at the rate of 30-90cm (1-3ft) per year. Hybrids of *M. cordata* extend to far more modest heights.

Callaway (1994) describes 17 cultivars of *M. acuminata*. Perhaps the clone with the greatest intensity of yellow colour is 'Golden Glow' found by Dr Frank Galyon in the Smoky Mountains of Sevier County, Tennessee and registered in 1975. This clone was temporarily lost in the US as a result of road construction. Fortunately, it had been propagated in New Zealand and returned to the US. More recently an additional four clones have been registered by Richard Figlar – 'Mister Yellowjacket', 'Crowley's Ridge', 'Ontario' and 'Syracuse'.

The same author describes four clones of *M. cordata*, of which the most famous and best is 'Miss Honeybee' registered about 1970 by James Merrill Nurseries of Painesville, Ohio. I grew out a sizable population of seed of the cross 'Golden Glow' × 'Miss Honeybee', from which I selected tree number R4-8. This tree is now about 15 years old and 8m (25ft) high. The flowers are an intense deep yellow. It has never been registered or named, but it has been given to several nurserymen. To my knowledge, no other hybrid of this cross exists.

Magnolia cordata is a round-headed tree that grows to about 10m (30ft) high. It is found almost exclusively in the State of Georgia. It differs also from *M. acuminata* by having a heavy pubescence on its leaves and stems. It is preferred as a parent to some degree because of its greater intensity of yellow colour in its flowers and its more modest height. Both species are extremely cold tolerant to –20 to –30°C (–29 to –34°F), or even more. They are free from any disease or insect pests. Both flower late after all danger of frosts.

Some First Generation Hybrids

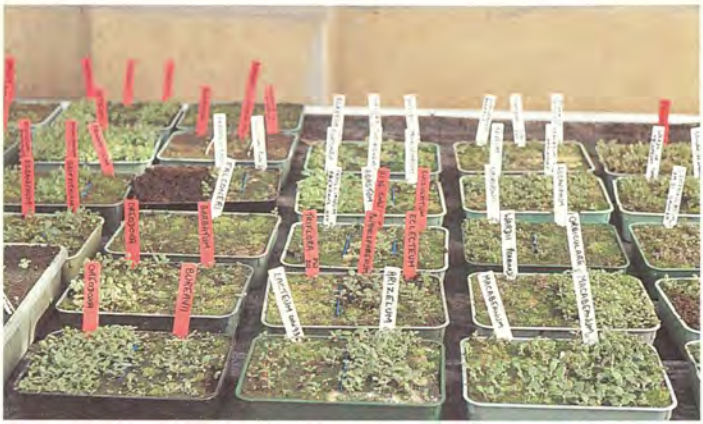
The first breeding programme that seriously used *M. acuminata* was at the Brooklyn Botanic Garden, Brooklyn, NY, under the direction of Dr Lola Koerting, and this work resulted in the grex, *M.* × *brooklynensis* (*M. acuminata* × *M. liliiflora*). The Brooklyn Botanic Garden also first made the hybrid of *M. acuminata* × *M. denudata* which was named 'Elizabeth'. Sister hybrids from the same crossing as 'Elizabeth' are:

'Butterflies' – Philip Savage hybrid; flowers 10-16 tepals, yellow; tree spreading; patented US Patent No. 7456.

'Golden Sun' – *M. acuminata* × *M. denudata*, hybridized by Dr David Leach; no description, picture only in *Magnolia* **31(1)**, page 24.

RHODODENDRONS FROM SEED

1. *Rhododendron seedlings germinating in half size seed trays (Fig. 13 see p.19)*



2. *Rhododendron seedlings pricked out into module trays (Fig. 14 see p.20)*

3. *Rhododendron seedlings after spring potting (Fig. 15 see p.21)*

Fig. 16 (right): The River Salween (Nu Jiang) in Yunnan, meaning the 'angry river', and the town of Gongshan, looking north *(see p.48)*

Fig. 17 (below): The September-flowering R. monanthum *at Dangshaofan on the Dulong Shan, Yunnan* *(see p.47)*

Fig. 18: A specimen of R. edgeworthii *with unusually thick leaf indumentum on the southern Gaoligong Shan, SW Yunnan (see p.46)*

Fig. 19: The orange-flowering R. lagunculicarpum *at 30,000m on Mt Rantemario, SE Sulawezi (see p.62)*

Fig. 20: The prominent scarlet flowers of R. pseudobuxifolium *near the summit of Mt Rantemario (see p.62)*

Fig. 21: R. rhodopus *on Mt Sesean, SW Sulawezi (see p.60)*

Fig. 22: R. *'Lea Rainbow' at Lea Gardens, Derbyshire, by Mr C F Taylor, winner of the 1999 Photographic Competition (see p.24)*

Fig. 23: A runner-up in the photographic competition from Mr J Wilkes-Jones – R. diaprepes *grown from seed collected at Gregynog, Mid Wales (see p.24)*

Fig. 24: R. excellens *grown from wild seed by Mr K Clapp, another runner-up in the photographic competition (see p.24)*

'Goldfinch' – *M. cordata* × *M. denudata*, hybrid by Philip Savage; tall upright tree, light yellow. Very early flowering in the spring.

'Ivory Chalice' – David Leach hybrid; yellow to yellow-green tepals, flowers 15cm (6in) across.

'Sundance' – August Kehr hybrid; barium yellow flowers, 20cm (8in) across, mid season flowering, tree is spreading.

'Yellow Fever' – registered by Ken Durio; flowers yellow with yellow-green midribs, 20cm (8in) in diameter.

'Yellow Garland' – David Leach hybrid; flowers 20cm (8in) across, yellow with yellow-green midribs.

There is a tendency for most of the above hybrids to fade in hot humid climates, although 'Sundance' has been reported by Durio to hold its colour well in Louisiana. However, in my experience, 'Elizabeth' tends to produce seedlings with higher levels of yellow colour than does 'Sundance'. To my knowledge all these trees are spreading and none are strongly columnar in growth.

I have used colchicine to double the number of chromosomes of 'Sundance' to produce a plant with 10 sets of chromosomes for a total of 190 chromosomes, 76 chromosomes from *M. denudata* and 114 chromosomes from *M. acuminata*. This doubled form has been named and registered as 'Sun Ray' because it has larger flowers, blooms later in the season, and has slightly deeper yellow-coloured flowers. In addition, the stems are thicker, the leaves are larger and thicker in texture. It has been reported from field observations that such polyploids with thicker leaves suffer less under low soil conditions and lower relative air humidity.

First generation hybrids involving *M. liliiflora* are relatively few in number. They are:

'Evamaria' – cross made by Brooklyn Botanic Garden; flowers are about 10cm (4in) across, purple with suffusion of yellow-green; US Patent No. 2820.

'Golden Girl' – cross made by August Kehr; flowers are almost entirely light yellow with only slight purple stains; registered in 1991

'Woodsman' – cross made by Dr Joe McDaniel, Urbana, Illinois, between *M. acuminata* 'Klassen' and *M. liliiflora*. Named and registered in 1974. The flowers are a mixture of yellow, green and purple, a combination of colours that is pleasing to some and repulsive to others.

'Woodsman' has been used extensively in my own program, and with great benefits. Somewhere in its genetic background are genes governing the character for fastigiate (columnar) growth habit of its offspring. Such a growth habit to me is a valuable asset, especially for street trees and for small areas. There are some offspring that have a growth habit akin to Lombardy Poplars.

Some Third Generation Hybrids

It is in the third generation that most of the superior hybrids are being found. Many of these are already named and registered with the International Magnolia Registrar and I will list some of those that have been duly registered. The colours are mostly yellow, but there are also pinks which have arisen from a combination of many genes in the intervening generations. The listing is as complete as circumstances permit, but it is unavoidable if some are missed because of

lack of published information:

'Barbara Nell' - hybrid by Philip Savage; tree pyramidal in growth; flowers creamy white with an overlay of pink; registered by Patricia Walton in 1994.

'Coral Lake' – cross by Dr David Leach, 'Legend' × 'Butterflies'; flowers pink suffused with yellow.

'Curly Head' – formerly 'Editor Hopkins'; cross by Philip Savage, *M. acuminata* × *M.* × *veitchii* 'Peter Veitch'; tree with dense habit; registered 1990.

'Daybreak' – 'Woodsman' × a white Gresham, probably 'Tino Durio', cross by August Kehr. This hybrid represents probably my best hybrid to date. Flowers are 20-23cm (8-9in) across, glowing rose pink in colour, extremely fragrant; tree very columnar, flowers late after frosts; hardy to –33°C (–28°F) according to experience by Dennis Ledvina (1995); very floriferous. The original tree is 10–12m (30–40ft) high with less than 2.5m (8ft) width at the base. It is a most glorious sight when in full flower. Registered 1991.

'Flamingo' - cross by Philip Savage between *M. acuminata* 'Fertile Myrtle' and *M. sprengeri* 'Diva'; flower colour pink like 'Diva', leaves recurved at edges, tree pyramidal and suitable for a street tree.

'Gold Crown' – 'Woodsman' × 'Sundance', cross by August Kehr; flowers 25cm (10in) in width, medium deep yellow, perhaps more yellow than 'Elizabeth' according to Durio; flowers after any danger of frosts; tree highly fastigiate growth, similar to 'Daybreak' (see fig. 3).

'Golden Gift' – hybridized by Dr David Leach; compact tree, yellow flowers 11cm (4½in) in diameter; produces axillary buds so flowers over a long period.

'Golden Goblet' – *M. acuminata* var. *subcordata* 'Miss Honeybee' × (*M. acuminata* × *M. denudata*); flowers strongly yellow, 16cm (6½in) in diameter, six tepals of heavy texture; tree pyramidal. Introduced by Dr David Leach 1997.

'Golden Sun' – 'Golden Gift', hybridized by Dr David Leach; tree compact in growth; flowers strong yellow, six tepals, 18cm (7in) in diameter, flowers in mid May. Registered in 1995.

'Gold Star' – cross by Philip Savage between *M. stellata* and *M. cordata*; very floriferous, small butter yellow flowers; tree is upright, vigorous and fast-growing; the leaves are fuzzy when young and have a bronze colour.

'Legend' – cross by Dr David Leach; early flowering, flower light yellow, about 13–15cm (5–6in) in diameter.

'Maxine Merrill' – cross by Philip Savage between *M. cordata* and *M.* × *loebneri*; flowers medium yellow with six tepals; tree small in size.

'Peachy' – cross by Philip Savage but named by Richard Figlar, *M. acuminata* 'Fertile Myrtle' × *M. sprengeri* 'Diva'; flowers large, somewhat floppy, peach-pink and pleasantly fragrant.

'Pink Surprise' – hybridizer not known by author, 'Galaxy' × (*M. acuminata* × 'Picture'); vigorous growing, tall tree-like growth, large pink flowers.

'Yellow Bird' – cross made at Brooklyn Botanic Garden by Doris Stone, *M. cordata* × 'Evamaria'; late flowering, deep yellow about 10–13cm (4–5in) across (see fig. 33).

'Yellow Lantern' – cross by Philip Savage, *M. cordata* 'Miss Honeybee' × *M.* × *soulangeana* 'Alexandrina'; tulip-shaped flowers, lemon yellow in colour.

'Ultimate Yellow' – backcross of *M. acuminata* × *M.* × *brooklynensis* (Joe McDaniel) made by Harry Heineman; flowers open cup shaped, 15cm (6in) in diameter, with some green back colouring.

Some Un-named and Un-registered Hybrids

The programme of developing new hybrids, especially yellow-flowered ones, continues at fever pace. All I can do is to mention a few promising candidates. Because I am not fully knowledgeable of other breeding programmes, this listing is consequently my own assessment of the most likely hybrids that I know may be registered.

'Sunburst' – 'Woodsman' × 'Gold Star'; flowers very deep yellow of moderate size, tree floriferous and open in growth; excellent. (Tree No. R-16-22.)

'Gold Cup' – *M.* × *soulangeana* 'Lennei' × 'Elizabeth'; tetraploid or perhaps even higher ploidy, leaves very thick texture and slightly crinkled, stems very thick; flowers cup shaped, deep yellow, and very heavy textured; late flowering in the spring.

'Hot Flash' – 'Woodsman' × 'Elizabeth'. This tree is the latest flowering magnolia in my entire collection; flowers deep yellow, heavy textured; tree is open in growth and probably a polyploid; named by a nurseryman friend.

An Unusual Un-named Hybrid

I will list this plant because it is my choice of one of the best in this category. It is a cross of 'Woodsman' × 'Elizabeth' (tree R-18-14) and combines all the genes for upright growth of both parents. It will certainly be named in the near future after some stock has been propagated. Every hybridizer worth his salt has aspirations to have a famous hybrid, and this one is mine. The flowers are deep yellow of good size and are plentiful. However the character that makes it unique is that it is fastigiate to the ultimate degree. It is the most columnar magnolia seen in my experience, and certainly the most fastigiate in the entire collection. It appears as though the branches had been trussed to the trunk during growth or like a tree that has had its branches tied by a nurseryman, ready for shipment. If this hybrid has the upward growth potential that is characteristic of most *M. acuminata* type plants, it will be a modern day Jack-in-the-Beanstalk.

While discussing unusual hybrids, another must be included. It is presently called 'March Till Frost' because it starts to flower in March and continues non stop until the autumn frosts kill the flowers. It is tree number R19-63 with the pedigree ([*M. liliiflora* × *M. cylindrica*] × 'Ruby'). This tree forms flower buds along the stems before it does leaf buds. In hot weather the purple flowers do not open fully as is common to all summer-flowering hybrids in the collection.

Some Reflections

Perhaps there will be many who will take issue with the above three phases in magnolia hybridization, and the fact that three or four species were the primary ones playing a major role in those phases. The fact must

remain that this assessment is logical enough to prepare us for the arrival of a fourth phase. In my own case I am turning my emphasis away from yellow hybrids *per se*, and toward hardy, late-flowering pure pinks and reds, but meanwhile watching the trend toward the incorporation of other members of the Magnoliaceae into magnolia breeding. High on that list is the use of deep pink forms of *Mangletia insignis* as parental material in magnolia improvement. Already there is a credible report of a pure pink hybrid of *Magnolia virginiana* that has resulted from such intergeneric crosses, and it foretells the possibilities of pink forms of such things as a pink-flowered *M. grandiflora* and pink forms of similar white-coloured species. The Chinese have already reported on a pink or red form of *M. delavayi*, which they believe arose with the hybridization of *M. delavayi* with close-by trees of *Mangletia insignis* (Luo Gui-Fen and Sun Wei-Bang 1996). Magnolias are marked exceptions to the accepted rules in regard to barriers to hybridization. (Kehr, 1998) One or two species can make a marked difference.

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The Salween

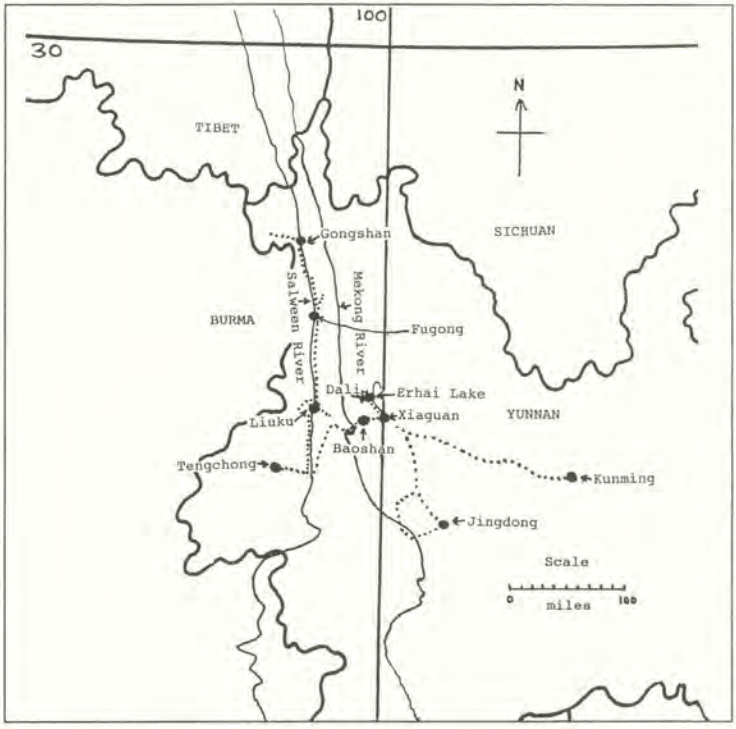
Peter Cox

The Nu Jiang, (meaning 'angry river') or Salween is one of the great rivers of South-East Asia. Having got to know stretches of the Tibetan Yarlung Tsangpo (in Assam the Brahamaputra), the Yangtze and the Mekong quite well, only the Salween of the main rivers of the area, apart from the Irrawaddy, remained unknown to me. I determined to see it at last in autumn 1997 and in the end saw almost too much of it, having been driven up and down it for the equivalent of the best part of a week between longitude 25 and 28. On the one really fine day on the river, we were able to enjoy the often magnificent and awe-inspiring scenery. In the sections of the rivers that I know, the Salween is undoubtedly the swiftest, and carries more water than the Mekong that runs parallel for such a long way due north to south. Another interesting difference is in the colour of the water. I have seen the Mekong in both spring and autumn and it is invariably a rich shade of chocolate brown while the Salween is grey. Virtually all the tributaries that I have seen of these two rivers are crystal clear.

Four of us, Philip Evans and myself from the UK, and Steve Hootman of the Rhododendron Species Foundation and Garrett Richardson from the US, arrived at Kunming, Yunnan, in mid September. Our old friend Guan Kaiyun, director of the Garden of the Kunming Botanical Institute, met us and told us that it had been the wettest summer in Yunnan for 10 years. This was not good news, as wet summers have a nasty habit of carrying on to make wet autumns and this is exactly what came to pass. Rain invariably means that mud slides and rock falls plague the unstable road systems, and four times we were stopped from reaching high altitudes due to roads being blocked or highly dangerous.

Reports of some particularly interesting rhododendrons had persuaded us to visit two parallel mountain ranges, Wuliang Shan and Ailao Shan towards the south-west of Yunnan. We had been warned that access to the higher reaches are difficult and so it proved. The combination of rain and a lack of mules and willing porters resulted in an almost completely wasted week as we failed to get above 2,300m (7,500ft). On Wuliang Shan we saw some fine forest within a reserve, containing some huge *R. arboreum* subsp. *delavayi*.

To attempt to make up for the lack of success here, we made a three day excursion to Gaoligong Shan beyond the Salween. This proved to be only marginally better than Wuliang Shan, as the southern end of Gaoligong Shan is of low altitude and to get to the higher parts further north would have taken at least a week in total. We stayed at



The 1997 expedition along the Salween, Yunnan

the top of the Da She Ya pass in a very primitive abode with no one else there and we were able to lock ourselves inside a walled compound – a lot better than some places where drunk truck drivers need to be kept at bay. We split into two parties to briefly explore the locality. The second party found a large flat-topped rock surrounded by and covered with *R. edgeworthii*, and they took us back to it. All the bushes were covered with fat capsules and with the thickest indumentum I have ever seen on this species (see fig. 18). It must have been a great sight in the spring. A plentiful camellia was just coming into flower, which we presume must be *C. oleifera* which has small white flowers in the autumn. This species is often cultivated for its oil-rich seeds. After a brunch, we drove back to where I thought I had seen several of the evergreen *Magnolia delavayi* on the way up in the half dark. We were about to give up when we found them, about 20 fine rounded bushes. All along the roadside was *Luculia pinciana* with lovely heavily scented white to pink flowers. What a shame this first rate shrub is too tender for our gardens.

That night was spent in supposedly better accommodation with Philip and myself sharing a room, but we soon discovered it was also occupied by several large mice. One lived in Philip's mattress and another in my headboard. There is something to be said for plain wooden beds!

The next morning we all set off on a long walk, supposedly to see the largest rhododendrons in the world, which we took to mean *R. protistum*. There were some stretches of fine forest interspersed by areas which had once been cultivated. In the middle of an open area was a group of old *Camellia reticulata*, covered with fat fruit, which are grown for their oily seeds. As we walked on and on we began to realise that we were not going to find *R. protistum* here, but we did find a gully containing drawn up trees of *R. arboreum* subsp. *delavayi* var. *peramoenum* which must have been fully 25m

(80ft). On the highest point of the walk were much smaller but very attractive conical specimens. This variety has narrower leaves than typical subsp. *delavayi* and somewhat resembles *R. roxieanum* var. *oreonastes* on a larger scale. Its elevation of only 2,400m (8,000ft) would indicate its tenderness in cultivation. I found one plant of *R. leptothrium* on this walk.

In the meantime, our Chinese leader Prof. Cheng Xiao, had gone off to collect the other four members of our party from Baoshan airstrip. This saved them the one and a half days journey by road from Kunming and we met them at the bridge over the Salween. The members of the second party were my old travelling companion Sir Peter Hutchison, Brian Poett, James Ogilvie of the Scottish Forestry Commission and Dr David Chamberlain, well known in rhododendron circles, from the Royal Botanic Garden, Edinburgh.

A telephone call had indicated that the hotel in Gongshan was fully booked so after a late start the next day we decided to try the Pianma (Hpimaw) Pass which my father and Reginald Farrer had approached from the Burmese (Myanmar) side in 1919. The road to the pass left the main road soon after the town of Liuku and started with a beautiful tarmacked surface; this turned into cobbles and gradually deteriorated with more and more bad bits which eventually our minibus could not negotiate. So we started to walk. A Chinese jeep with no handbrake picked four of us up and dropped us at 2,700m (9,000ft) just as it was getting really interesting. Rhododendrons seen were the magnificent but rare and tender *R. kyawii*, a wide-leaved form of *R. sinogrande*, *R. sidereum*, one *R. arizelum*, *R. annae* var. *laxiflorum*, possibly *R. pseudociliipes* which is not in cultivation, and two species with glaucous leaf undersides, *R. genestierianum* and *R. zaleucum*. Of particular interest was a plant lying on the roadside (no doubt having come off a rock or tree) of the epiphytic *R. monanthum*. This has never been in cultivation and is rather better than we expected with a single (occasionally two), deep yellow tubular flower and neat foliage (see fig. 17). This is apparently the only rhododendron species that invariably flowers in the autumn and could be useful for hybridizing. We saw several more plants later.

Lack of time forced us to leave for the valley but with plans for half the party to hire a jeep and have another shot at reaching the pass the following day. Alas, it turned out to be a thoroughly wet morning but the rickety old jeep we hired did get us up to the place that halted the minibus the day before. The rain got heavier and a constant stream of rocks fell on the road, forcing us to give up. I was heart-broken, as I had so much wanted to get to where my father had been. The other party went up the road on the opposite side of the Salween to near Caojian and at least had some success.

The road on to Gongshan was now blocked so we decided to go up Biluoxue Shan on the Salween-Mekong divide above the small town of Fugong, probably for three nights. We started through cropped areas and then crept our way along an aqueduct which was cut out of a cliff by forced labour during the Cultural Revolution. We walked along the top of a wall often only 45cm (18in) wide. Sometimes there were shrubs on the cliff face, other times nothing to stop

one falling into the abyss with a drop of perhaps 500m (1,500ft). On the way back, a stone gave way beneath Steve and he was only saved by a shrub. Garrett had a similar mishap but fell the other way into the water. Not a place I am going back to. On the way up our fears were partly distracted by the plants hanging off the cliff above us. Among the rhododendrons seen were several Maddenia including the king of them, *R. nuttallii*, and the probable queen, *R. megacalyx*, plus the yellow-flowered *R. xanthostephanum* and more *R. kyawii*. When at last we came to the end of the aqueduct, we passed a large *R. sinogrande* and *R. genestierianum* growing on a rock and then, much to our surprise, a *R. sinogrande* growing epiphytically half way up a large tree.

After plodding on up the hill through the forest, we heard shouts behind and we were led to our 'camp', under an overhanging cliff where there was just enough room for all of us, including porters, to lie out without tents. A curtain of water surrounded us, coming off the top of the cliff, and this increased substantially in volume over night. Surprisingly, I slept quite well. In the morning we could see fresh snow on the steep slope opposite and this was only at about 3,000m (10,000ft) on the 28 September. We climbed up another 550m (1,800ft) over a slippery log bridge, through a torrent and then into deeper snow. I could just make out a splendid waterfall through the snowflakes. The conditions were so dreadful that we decided to give up and return to Fugong, after a quick lunch under our cliff where the water was gradually seeping into our previous sleeping area. The long walk down was made slow and difficult by the now appallingly slippery path. Oh, the joys of a plant hunter! Other rhododendrons were found but these were mostly small and obviously cut over: *R. anthosphaerum, R. rubiginosum, R. glischrum*, the epiphytic *R. leptocarpum* and a few curious big-leaved seedlings, one resembling *R. rex* subsp. *fictolacteum* and another *R. rothschildii*. What riches there must be higher up.

After a rest day with the luxury of showers, the all clear came for the road to Gongshan and, apart from having to wade through an icy torrent and watching young boys crossing the Salween on a wire rope, little of note happened. Gongshan (see fig. 16) is a cleaner little town than Fugong and all but Brian thought it preferable. As the 40km (25 mile) road to the north of Gongshan was blocked, we decided to make our main trek to the west. The path started up the gorge of a tributary of the Salween, above which a new road is being constructed. As usual with new roads, the erosion above and particularly below the road is horrific. They were blasting on the opposite bank with rocks hurtling into the river and one large one even came over on to our side. We actually ran to get out of the way. A mule path snaked its way up an unstable sheer mud cliff and I watched very reluctant mules start to make the climb while parts of the cliff were on the move.

The forest became better and better with huge *Taiwania flousiana* trees with their heads away above the rest of the forest. This conifer is reputed to be the tallest tree in Asia but it is much favoured for its timber, especially for making coffins, and this must be one of the last remaining stands. (Since writing the above I have been informed that

there is an even better stand further west on the Burma frontier.) In theory, these trees should be safe as they are within the large Dulong reserve but new roads invariably mean forest destruction, legal or illegal. Our accompanying manager of the reserve told us that one man had cut a *Taiwania* and had been sent to jail for a year.

Various Magnoliaceae are common in this forest. Three we identified were *Magnolia rostrata, M. campbellii* subsp. *mollicomata* and *M. globosa*. There was no evidence of the first two having flowered this year. *M. rostrata* is a fine foliage plant with huge leaves in whorls at the branch tips. An evergreen member of Magnoliaceae at lower elevations is probably a species of *Manglietia*. A further find of *Rhododendron nuttallii* revealed one shoot with four enormous capsules. Nearby were several *R. protistum* at last. Several had the frequently seen partially immature leaves with a rim of indumentum around the edges but one plant had narrower, less rugulous leaves and indumentum all over the leaf undersurface, resembling *R. magnificum* that I have seen in cultivation. The type location of this species is not that far away into Burma. The other big-leaved rhododendrons here were *R. sinogrande* and, higher up, *R. arizelum*. A small group of a long, rather narrow-leaved rhododendron really puzzled us. Steve and I thought it might be the rare *R. vesiculiferum* which is recorded from this area but at a higher elevation. David said no, it has no vesicular hairs so we reckoned it must be something new.

Other species here were trees of *R. moulmainense* (*stenaulum*) and *R. genestierianum*, both with smooth barks, several Maddenia including a few *R. taggianum* and two Pseudovireya, *R. vaccinioides* and possibly *R. asperulum* which should have yellow flowers. It was hard to separate the smaller Maddenia from the Boothia *R. sulfureum* and *R. chrysodoron*, but we think that we may have found both of the latter. Of particular interest was a plant related to or a form of *R. edgeworthii* which may be *R. seinghkuense*. This was more compact and had shorter, wider leaves than *R. edgeworthii* which was found in its typical form higher up. There were many compact bushes of *R. neriiflorum* subsp. *phaedropum*. Higher up, a little indumentum appeared on similar plants and, still higher, they turn into typical *R. floccigerum* with its scattered floccose indumentum. Nearby was a fine plant of *R. sperabile* var. *sperabile* with shorter leaves and a continuous indumentum, but it was the only one we could locate.

Just below our second camp at the river's edge was one of these micro-communities where many rhododendron species have congregated, this time around a tree, several obviously from much higher elevations. I have found several of these communities over the years but this was perhaps the most remarkable. They were: *R. mekongense, R. cephalanthum, R. rubiginosum, R. fulvum, R. arizelum, R. monanthum, R. leptocarpum, R. campylocarpum* subsp. *caloxanthum, R. sanguineum, R. dichroanthum* subsp. *scyphocalyx, R. stewartianum, R. charitopes* subsp. *tsangpoense, R. calostrotum* subsp. *keleticum, R. neriiflorum* subsp. *phaedropum* and most surprisingly, *R. cinnabarinum*, never recorded anywhere near here before – in all 15 species. This lot included most of what we were to see going up to and around the pass, some 800m (2,500ft) higher.

Much of the forest on the way to the pass, in contrast to below, had been cleared, no doubt mostly by porters toing and froing over the pass, to make fires to cook and keep themselves warm and for building their houses. There were many bushy, flat-topped *R. arizelum* and I found a single plant of *R. megeratum* on a tree stump. Another unexpected find was a few *R. triflorum*, similar to those around the Yarlung Tsangpo in SE Tibet, without a peeling bark. *R. stewartianum* became the dominant species most of the way up and on the top ridge was an undulating carpet of dwarf and semi-dwarf Ericaceae – mostly dwarf rhododendrons including many of those already listed around the tree community plus *R. citriniflorum, R. temenium, R. saluenense* subsp. *saluenense, R. chameunum, R. forrestii* and at the highest point, *R. rupicola.*

The view from the top looking west was a skyline of hills of remarkably even height. To the south I am sure we were looking over into Burma. To the north, our own ridge carried on, just a little higher than we were. We were blessed with wonderful weather for our five-day trek which was particularly lucky for, as we travelled back south, it became evident that it had hardly stopped raining there since we left that area and in fact we were lucky to be able to get through as the road had only just been cleared once more. Sadly, this ruled out any further attempt on the Pianma Pass.

The first part of the journey south was during fine weather and we were able to see the tops of the mountains all around. The whole valley is extremely impressive. One mountain range looks especially promising for plants, being completely covered with vegetation, but its sheer sides and beetling pinnacles would make it near-impossible to explore. One part of the range has a large circular hole in it and is known as the Stone Moon Mountain.

Our last but one excursion was an attempt to find George Forrest's grave at Tengchong (formerly Tengyueh). The graveyard had been much disturbed and planted up with camellias for their oil. We found one upturned gravestone of British people but neither that of Forrest nor his friend Consul Litton. We did discover the old consulate which had obviously not been used by the British since the Japanese invasion in 1941.

After a tedious drive back to Dali up the Yangbi Gorge where a new road is being built, we had a day on the Cangshan up the road that is now frequently used by plant hunters. We were so fortunate to have another good day to see the autumn colour; with the reds and oranges of *Sorbus* and yellows of *Betula,* plus masses of the lovely, but hard to cultivate, *Gentiana melandrifolia* in full flower along the path under the rhododendrons.

In all it was a very interesting and enjoyable trip but our lack of success in most of our efforts to reach high elevations and failure to find many of the plants hoped for, limited its rewards. I hope to return to the same area in springtime when I have been told the weather should be better, though another authority on the subject says it could be even worse!

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Towards Lime-Tolerant Rhododendrons

Judy Rose, Lyn Andrews, Tim Marks and Ken Tobutt

In 1993 the Ministry of Agriculture, Fisheries and Food (MAFF) decided the time was right for some research to help overcome lime intolerance in the Ericaceae. MAFF invited research organizations to put in bids and a contract was awarded jointly to the University of Sussex and Horticulture Research International (HRI). The University concentrated on studying the physiology of lime intolerance in *Erica*; their work will not be described here. The work in HRI was conducted at East Malling, Kent, and Efford, Hampshire. In this interim account, we report some background information and initial work on testing, breeding and physiological studies in *Rhododendron*. We do not intend to include a full review of past work on lime-tolerance but to record what we are doing in the context of research elsewhere.

The starting point for any research project is to find out what is known already. As a result of studying the literature, particularly Cox (1985 and 1990), and discussions with other researchers, we identified a list of taxa which have been reported to show some lime tolerance (Table 1, see p.56). We would welcome further suggestions. So far as the nature of the tolerance is concerned, Rankin (1997) has recently summarized four mechanisms, apart from intrinsic tolerance, which may enable rhododendrons to cope with lime:

1. the rhododendrons restrict their roots to the humus layer above the calcareous soil
2. the limestone is dolomitic, containing magnesium, which enables the plants to survive
3. the limestone is hard and effectively insoluble
4. the high rainfall in their native habitats washes away the calcium as fast as it dissolves

Rhododendron luteum, which has succeeded in colonizing an area of Burnham Beeches, is an example of the first (Woodsman, 1986). The survival of *R. occidentale* in an area of sparse chaparral in California, on highly alkaline soil, is thought to be an example of the second (Leiser, 1957). Kinsman (1998) thought that the fourth mechanism accounted for most species growing in Yunnan, China, where he measured soil pH. He found only one species, *R. primuliflorum*, actually growing in contact with soil of high pH. However, D W H Rankin (personal

communication) has made a similar study but with conflicting results.

Our objective was to decide whether any species has intrinsic tolerance and thus has the potential for cultivation on calcareous soils in Britain. With only three years for our project and relatively few plants of particular species, we needed methods which would give us some results within this time scale. The expertise at HRI-Efford in growing plants in containers and in propagation was utilized. Lyn designed four mixes based on Shamrock Irish moss peat, each with a different pH, as follows:

pH 4 – peat
pH 5 – peat with 2.5g/l magnesian limestone
pH 6 – peat with 2.5g/l magnesian limestone and 7.5g/l limestone flour
pH 7 – peat with 2.5g/l magnesian limestone and 15g/l limestone flour

For germinating seeds, the mixes were used as stated, but for use with rooted cuttings or for potting up seedlings, a standard base dressing was added consisting of:

0.75g/l potassium nitrate
0.75g/l single superphosphate
0.3g/l FTE (fritted trace elements) WM255.

A protocol was developed for screening young plants in pots. Cuttings that had been rooted in plug trays containing acid-washed sand were grown in the four mixes. The cultivars of *Rhododendron* screened initially were the reputed calcicole or lime-tolerant, *R.* 'Cunningham's White', and the two *R. yakushimanum* hybrids 'Dopey' and 'Hoppy' which were assumed to be lime-susceptible or calcifuge. All three cultivars performed best at pH 4 and 5, and also grew successfully at pH 6 but did less well at pH 7. Interestingly, little difference was seen between the response of the three cultivars. In a further limited trial, small numbers of plants of 13 of the species listed as possibly lime-tolerant were screened. Most plants died on the pH 7 mix but *R. augustinii* 'Electra', *R. caucasicum* 'Pictum' and *R. lutescens* 'Bagshot Sands' grew reasonably well, surviving for a full six-month growing season.

While the pot tests were progressing at Efford, Jeni Kubba at HRI-East Malling started a programme to study the genetics of lime tolerance in *Rhododendron*. Twenty of the reputedly lime-tolerant species, including the 13 used at Efford, were obtained, plus 30 susceptible species from corresponding subsections. Where possible, named clones of good horticultural worth were used. Each clone used as a female parent was selfed, to assess its self-fertility. Inbreeding depression was observed with some progenies. The first crosses involved *R. yakushimanum*, the species the trade considers to be ideal for today's markets, and *R.* 'Cunningham's White'. The latter has been used as a lime-tolerant rootstock and was taken as the calcicole standard to beat. Later, tolerant species were crossed with susceptible species from the same and different subsections and the resulting seedlings were screened for tolerance on the pH 4 and pH 7 peat mixes devised at Efford. Most seedlings which germinated on the pH 7 mix were chlorotic but a few were green initially.

When the time came to pot up the seedlings, all those which remained green on the pH 7 mix as well as a sample of those

initially on pH 4 mix were potted up in the pH 7 mix. All these seedlings potted up in pH 7 mix died within a year. One of the problems with this programme is that the full results of one year's crosses are not known until the end of the next year. Therefore it was not until the third year of the project that we decided to intercross reputedly tolerant species within the respective subgenera and in future to use the pH 6 mix as the initial selection medium. In 1996 Judy took over from Jeni who left to start a family.

In March 1998, Judy visited the Federal Centre for Breeding Research on Cultivated Plants at Ahrensburg in northern Germany. A programme to breed lime-tolerant rhododendrons was started there in 1980 by Dr Walter Preil. Two rootstocks derived from a cross of *R.* 'Cunningham's White' × *R. fortunei* made in 1980 have been released recently through Inkarho, a consortium of German nurseries. These rootstocks grew significantly better than *R.* 'Cunningham's White' on growing medium containing 10g/l of calcium carbonate and also had improved rooting ability.

As well as undertaking further crosses, the German team has screened seedlings raised from open-pollinated seeds obtained from botanical gardens. Chaanin (1996) identified a seedling of *R. micranthum* which withstands up to 20g/l of calcium carbonate! This clone has been propagated vegetatively and is being used in further breeding at Ahrensburg. Judy was shown hybrid seedlings which Dr Chaanin has obtained from crosses of *R. micranthum* with *R. ferrugineum*, *R. hirsutum*, *R. impeditum* and three cultivars, *R.* 'Blaumeise', *R.* 'Enziana' and *R.* 'Princess Anne', despite *R. micranthum* belonging to a monotypic subsection.

In 1997, the initial MAFF funded project at HRI and the University of Sussex ended. However, we were able to include some of the work on the genetics of lime tolerance into a wider MAFF-funded project to create novel woody ornamentals by breeding and biotechnology. The initial decision to use good horticultural clones has proved to have disadvantages. Pollen-viability tests showed that some clones have very poor pollen, and poor pollen-viability may have been selected for unintentionally in the past when selecting for low seed set and regular flowering. We also realized that, as the existing good horticultural clones were almost certainly identified on acid soils, they were not necessarily the clones that would grow best at high pH. We have obtained seed from the Royal Botanic Gardens (RBG), Kew, the Rhododendron Park, Bremen, Germany, and from the Kunming Institute of Botany, China, as well as wild seed via the Rhododendron, Camellia and Magnolia Group of the Royal Horticultural Society (RHS); we will also screen the germinating seedlings for lime tolerance. The wild seed is particularly important for species belonging to subgenus Hymenanthes because, according to Cox (1985, p241), members of that subgenus are mostly self-sterile and so seed from botanical gardens is unlikely to be true to name whereas members of subgenus Rhododendron are self-fertile and therefore their seed is more likely to prove true.

We shall now digress slightly. Frank Dunemann, at Ahrensburg, has been concerned that there appears to be more than one clone of *R.* 'Cunningham's White'. Judy

asked Kew if they still had the letters referred to by Bean (1976, p846–47) which might shed some light on the parentage of this old cultivar. In response, we were informed that all the documents at Kew had been catalogued in the 1960s but that these particular letters were not in that catalogue; they would try looking in the herbarium. In due course, attached to the herbarium sheet of *R.* 'Sulphureum', another name for *R.* 'Cunningham's Sulphur', was found the 1909 letter from J Fraser, then co-proprietor of Cunningham, Fraser & Co at Comely Bank Nurseries, Edinburgh, the nursery at which James Cunningham produced *R.* 'Cunningham's White' in the 1830s. It confirms what we had begun to suspect, namely that *R.* 'Cunningham's White' is not a cultivar but is a grex, i.e. a named cross according to Fraser, of *R. caucasicum* × *R. arboreum album.*

Kenneth Cox (personal communication) pointed out that, in the 1830s, raising seedlings was the only way of producing new rhododendrons as no way of rooting their cuttings had been found. At Glendoick there are several clones of *R.* 'Cunningham's White' and also of *R.* 'Cunningham's Blush'. Judy has sent cuttings of four clones of *R.* 'Cunningham's White' and two clones of *R.* 'Cunningham's Blush' to Germany so that Dr Dunemann can establish whether the clone used at Ahrensburg is the same as that used at East Malling and how they relate to those at Glendoick. We suspect that James Cunningham must have had a clone of *R. caucasicum* which was very lime tolerant. *R. caucasicum* may provide a good source of lime tolerance to introgress into *R. yakushimanum* as both are within subsect. Pontica.

Dunemann *et al.* (1997) have produced a genetic map of DNA markers using the progeny from the cross *R.* 'Cunningham's White' × (*R.* 'Cunningham's White' × *R. fortunei*). At HRI-East Malling, we will try to produce a map from the cross *R. hirsutum* × *R. ferrugineum.* These two species should allow a good comparison, as they are closely related and hybridize naturally but differ greatly in their responses to lime. The progeny will be screened for lime tolerance on the pH 6 mix but, as soon as chlorosis is detected, individual seedlings will be transferred individually to the pH 4 mix and the time in the pH 6 mix recorded, in order that the full population survives for mapping.

While the genetic study has been ongoing at East Malling, Tim has used tissue culture to try to understand the physiology of calcifugy. Because shoots without roots and complete plants can be grown in tissue culture depending on the hormones applied, it may be possible to separate the influence of roots and shoots upon lime tolerance. It is also easier to separate in tissue culture than in soil or pot studies the influence of individual factors such as calcium and high pH. Tim has developed a system in which shoots are rooted into cellulose plugs (like extra-large cigarette filters) and grown in a vented culture vessel, i.e. a honey jar with a gas-permeable lid, in a growth room so that they can photosynthesize. The liquid medium can be modified with respect to, e.g. calcium content or pH, to determine the effects of these factors on the physiology of calcicole and calcifuge plants. So far, he has concentrated on the calcicoles *R. hirsutum* and *R.* 'Cunningham's White' and the assumed calcifuges *R. ferrugineum, R. yakushimanum* hybrids 'Dopey' and 'Hoppy'.

Results with this system have shown that rhododendron roots are able to reduce the pH of the culture medium by extrusion of hydrogen ions, but it is not yet clear whether calcicoles and calcifuges differ in this respect. Stabilizing the pH of the medium with non-phytotoxic buffers (2-[morpholino] ethanesulphonic acid and 3-[morpholino] propanesulphonic acid), caused chlorosis in calcifuges at pH 6, but not until pH 7 in calcicoles, suggesting a way to discriminate between tolerant and susceptible clones. Bicarbonate, which contributes to the high pH of calcareous soils, gave results similar to buffered high pH whereas calcium itself, applied as an organic salt, was readily taken up but neither inhibited growth nor induced chlorosis.

Our present MAFF-funded project continues until the year 2000. We are aware that others before us have attempted to breed and select for lime tolerance in *Rhododendron;* Judy was slightly daunted to be told by one nurseryman that he had been trying for 50 years to achieve that goal, but had given up now he was retired, whereas she had been given only a three-year contract! However, there are molecular techniques available to us now which should hasten our better understanding of calcifugy and enable us to identify the genes associated with lime tolerance. We look forward to reporting in due course on our further progress.

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DR JUDY ROSE *and her co-authors work at Horticulture Research International at East Malling, Kent, or Efford, Hampshire*

TABLE 1. SPECIES AND CULTIVARS OF *RHODODENDRON* REPUTED TO HAVE SOME TOLERANCE TO LIME

Species	Reference
	Subgenus Rhododendron
R. ambiguum	Cox (1990, p.332) , Grove (1927, p.427)
R. augustinii	Cox (1989, p.88), Cox (1985, p.95), Grove (1927, p.427), Jackson (1940, p.212)
R. calostrotum subsp. *riparium*	Berrisford (1973, p.66), Cox (1985, p.24)
R. campylogynum	Cox (1985, p.88), Grove (1927, p.427)
R. cephalanthum subsp. *cephalanthum*	Cox (1985, pp.146-47, 248)
R. ciliatum	Cox (1985, p.248), Grove (1927, p.427)
R. collettianum	Cox (1985, p.148)
R. complexum	Cox (1985, p.101), D W H Rankin (pers. comm.)
R. cuneatum	Jackson (1940, pp.147, 164), D W H Rankin (pers. comm.)
R. dasypetalum	Cox (1985, p.99)
R. davidsonianum	Grove (1927, p.427)
R. fastigiatum	Cox (1985, p.99)
R. hanceanum	Grove (1927, p.427)
R. hemitrichotum	Cox (1985, p.127)
R. hippophaeoides	Cox (1985, pp.103, 248), D W H Rankin (pers. comm.)
R. hirsutum	Cox (1985, pp.120-21, 248), Jackson (1940, p.164), Kingdon-Ward (1926, p.85), D W H Rankin (pers. comm.)
R. impeditum	Jackson (1940, p.164), Davidian (1982, pp.190-91)
R. intricatum	Jackson (1940, p.164), Cox (1985, p.104)
R. kyawii	Cox (1990, pp.244-45)
R. lapponicum	Cox (1985, pp.105-06)
R. lepidotum	Kingdon-Ward (1926, pp.50, 72), Cox (1985, pp.113-14)
R. longistylum	Grove (1927, p.427)
R. lutescens	Cox (1990, p.332)
R. lyi	Cox (1990, p.228)
R. maddenii	Cox (1990, pp.238-39)
R. micranthum	Chaanin (1996, pp.50-51), Grove (1927, p.427)
R. nivale	D W H Rankin (pers. comm.)
R. oreotrephes	Cox (1990, pp.295-96)
R. orthocladum	Davidian (1982, p.199)
R. polycladum	Cox (1985, p.99)
R. polylepis	Grove (1927, p.427)
R. primuliflorum	Kinsman (1998 pp. 32-38), Cox (1985, p.150)
R. racemosum	Jackson (1940, p.164), Cox (1985, pp.127-28), D W H Rankin (pers. comm.)

R. rubiginosum	Cox (1990, pp.203-04, 332), Grove (1927, p.427), Kingdon-Ward (1926, pp.72, 94), D W H Rankin (pers.comm.)
R. rupicola	Kingdon-Ward (1926, p.85), Jackson (1940, p.167), Davidian (1982, p.203), D W H Rankin (pers. comm.)
R. russatum	Davidian (1982, p.204)
R. saluenense	Cox (1985, pp.125-26)
R. telmateium	D W H Rankin (pers. comm.)
R. tephropeplum	Cox (1985, p.132)
R. trichocladum	Cox (1985, p.137)
R. uvariifolium	Cox (1990, p.182)
R. valentinianum	Cox (1985, p.117)
R. virgatum subsp. *oleifolium*	Grove (1927, p.427), Jackson (1940, p.147)
R. yungningense	Cox (1985, p.99)
R. yunnanense	Cox (1990, pp.301-02), Grove (1927, p.427), D W H Rankin (pers. comm.)

Subgenus Hymenanthes

R. adenogynum	Cox (1990, pp.264-65), D W H Rankin (pers. comm.)
R. balfourianum	Cox (1990, pp.266-67), D W H Rankin (pers. comm.)
R. beanianum	Lancaster (1991, p.585)
R. caucasicum	Parent of *R.* 'Cunningham's White'
R. decorum	Cox (1990, pp.168, 332), Grove (1927, p.427), Jackson (1940, p.147), Lancaster (1991, p.585), D W H Rankin (pers. comm.)
R. dichroanthum	Grove (1927, p.427)
R. dichroanthum subsp. *scyphocalyx*	Cox (1985, p.248)
R. fortunei	Cox (1990, p.332)
R. haematodes	Grove (1927, p.427)
R. insigne	Cox (1990, pp.103-04, 332), Grove (1927, p.427)
R. makinoi	Cox (1985, p.178)
R. martinianum	Cox (1990, p.261)
R. oreodoxa	Grove (1927, p.427)
R. oreodoxa var. *fargesii*	Cox (1990, p.332)
R. phaeochrysum	D W H Rankin (pers. comm.)
R. principis	Cox (1990, pp.274-75)
R. przewalskii	Cox (1990, p.275)
R. sanguineum subsp. *didymum*	Cox (1985, pp.167, 248)
R. smirnowii	Cox (1990, pp.252-53)
R. taliense	Grove (1927, p.427)
R. traillianum	Cox (1990, pp.277-78, 332)
R. vernicosum	Cox (1990, p.332), D W H Rankin (pers. comm.)
R. wardii	Cox (1990, pp.144-45)
R. williamsianum	Cox (1985, p.248)

Subgenus Pentanthera

R. luteum	Woodsman (1986, p.17)
R. oblongifolium	Cox (1990, p.118)
R. occidentale	Cox (1990, pp.118-20), Leiser (1957, pp.47-51)
R. prinophyllum	Cox (1990, p.121)

Cultivars

R. augustinii 'Electra'	Efford screening trial
R. 'Cunningham's White'	Bean (1976, p.847)
R.(caucasicum × *?)* 'Pictum'	Efford screening trial
R. lutescens 'Bagshot Sands'	Efford screening trial
R. 'Sir Robert Peel'	Hanger *et al.* (1981, pp.479-83)

An Expedition to Sulawesi, Indonesia – May 1997

John Farbarik and Hank Helm

There are many reasons why people travel to different parts of the world, not the least of which are the chance for adventure and to see rare rhododendron species in the wild. Our trip to Sulawesi, Indonesia, was made for both of these reasons.

Planning began in late October of 1996. The trip would be unique because neither John nor Hank were experts in Vireya rhododendrons; John had only a passing acquaintance with these plants and Hank had done limited research on sect. Vireya. John had once worked in Indonesia, had visited Indonesia in 1996, and spoke some Indonesian while Hank had never been to South-East Asia and spoke no Indonesian. Neither John nor Hank had climbed to elevations exceeding 1,981m (6,500ft).

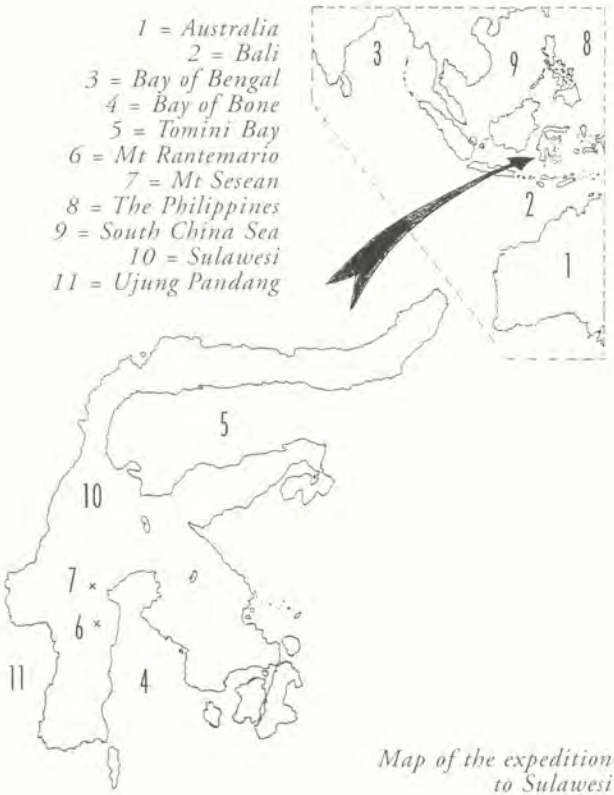
It evolved while planning for the trip that John assumed responsibility for logistics, including transportation to the area of Sulawesi chosen for exploration, guides, accommodation and food. Hank's responsibility was to do enough research to be able to recognize the Vireyas which might be encountered and to make tentative species identification.

Mount Rantemario in the Latimojong Range in south-west Sulawesi was the logical choice for exploration as it was high enough to provide habitat for Vireya rhododendrons, a number of Vireyas had been previously collected in the area and it was close to major roads and towns known to John from his previous trip to the area. This range has several peaks between 2,500 to 2,800m (8,300–9,300ft) with Mount Rantemario, the highest mountain in Sulawesi, having an elevation of 3,438m (11,280ft). During a recent previous exploration of the area (*The Ecology of Sulawesi*, Gadja Mada University Press) large numbers of *Rhododendron* had been noted, and of the 15 species previously collected here, many have been collected only once.

A May trip was decided upon. May is at the end of the rainy season and although Vireyas have no definite flowering season, descriptions in the literature recorded more blooms at this time of year than at any other. Costs are also lower in May as it is prior to the major tourist season.

Our explorations would begin near the town of Rantepao in Tana Toraja (Toraja Land), in south-west Sulawesi, with a trek up Mt Sesean, which John and Keith Adams had climbed the previous year. From there climbing in the Latimojong Mountain Range would follow.

Up to the week prior to leaving for



Map of the expedition to Sulawesi

Indonesia our efforts to make arrangements for accessing the Latimojong Range had proven futile. We had no guide or porters and only a very sketchy route plan to Rantemario. However, we decided to go anyway and, if necessary, arrange for a guide and porters after we arrived in the city of Rantepao. If those efforts failed, we would search out local villagers to guide us and to carry our gear as we went along our way. At that time contact was made with Mr Harun Azikin of Bagus Indonesia, a tourist and travel agent in Ujung Pandang, the largest city in Sulawesi. Mr Azikin offered to put together a trip for us including a guide, a member of the Indonesia Mountain Rescue 'SAR' (search and rescue) organization, a car and a driver. This guide had extensive experience in the Latimojong Range. He knew the route and had climbed Mt Rantemario several times. He also knew some English. Our interest was confirmed by telephone with the agreement to meet with Mr Azikin upon our arrival in Ujung Pandang.

We departed Sea Tac airport on 8 May, 1997. Our total flight time to Ujung Pandang was approximately 20 hours with overnight stays in Taipei, Taiwan and Denpasar on the Island of Bali. We finally arrived at our destination on 11 May.

Contact was made with Bagus Indonesia at the airport with an agreement to meet with Mr Azikin that same afternoon. Later at the offices of Bagus Indonesia, Fanda 'Acho', the guide recommended by Mr Azikin, showed us maps of the Latimojong Range. Being satisfied with Acho's knowledge of the area and his ability to both understand and speak some English, we agreed on a tentative plan and signed a contract for the guide, a vehicle and a driver. The driver would take the two of us and the guide, first to Rantepao for a climb of Mt Sesean and then to the vicinity of the Latimojong Range for a climb of Mt Rantemario and adjacent Mt Sinagi. We would depart for Rantepao the following morning. By mid-afternoon the temperature had climbed to 35.5°C (96°F) with accompanying high humidity.

The next day, 12 May, was spent driving from Ujung Pandang north along the west coast of Sulawesi past rice fields, fish farms and fishing villages and then inland through groves of clove trees into the mountains of Tana Toraja. The small town of Rantepao at elevation 744m (2,440ft) was reached in mid afternoon. Arrangements were made for our guide to stay in Rantepao the next day and to prepare for our ascent of Rantemario while we climbed Mt Sesean.

The next morning, after a drive up the scenic and winding road to Batumonga, we engaged a local villager to guide us up Mt Sesean. It was a beautiful sunny day and the hike up through coffee plantations and farms to the relatively open brush and grasslands near the summit was very enjoyable. The view from a ridge near the summit was of the valley below with its terraced rice fields and unique Toraja houses. The town of Rantepao and the cloud-covered Latimojong Range could be seen in the distance.

We photographed four species of *Rhododendron* on Sesean. The tentatively identified species are: *R. rhodopus, R. zollingeri, R. malayanum* and *R. quadrasianum* var. *selebicum.* The 2.5–3m (8–10ft) shrub of *R. rhodopus* had trusses of up to 10 scented, large white flowers that are tubular with widely flaring petals (see fig. 21). *R. zollingeri* was readily identifiable with leaves elliptic-lanceolate having a shortly acuminate apex and with three to eight brick red flowers on 1–1.5cm (½in) pedicels in umbles of three to eight. *R. quadrasianum* var. *selebicum* was not in bloom but was a delightful dwarf shrub with one 1.2cm (½in) long narrowly-obovate leaves.

During the morning of the 14 May we drove south, along the highway from Rantepao to Ujung Pandang, to the town of Cakke at elevation 500m (1,640ft). From there we proceeded east into the higher mountains of the Latimojong Range. The road became progressively narrower as the surface changed from asphalt to gravel to mud. Approximately two hours of driving brought us to the village of Gura. There, we were advised by the driver that the vehicle could go no further. He was left to return to Rantepao with instructions to meet us seven days later. At Gura, our guide Acho engaged the services of a horse and horse driver to carry our packs. After walking for approximately 8km (5 miles) along the narrow rough mountain road, we reached the small village of Buntudeo. The temperature remained around 31°C (88°F). At Buntudeo we found a large backhoe working at the end of the road. The operator was casting the excavated material over the side of the hill and across the only path from Buntudeo up into the mountains. The trail which was several hundred feet above a river, had been nearly obliterated. We couldn't turn back, so we carefully inched our way across the slide. Our guide and the horse and horse driver were left to follow.

At Rantelemo, a town 3.7km (2 miles) from Buntudeo, we stopped to wait for Acho to arrive with the horse and our packs. After their arrival, we learned that Acho had dropped his tent while transferring our packs from one horse to another. (The horse from Gura couldn't cross the dangerous slide so all of our gear had to be off-loaded and carried across. It was then loaded on to another horse which had come from the opposite direction.) The hillside was so steep

that the tent slid several hundred feet to the edge of the river and Acho had to climb down to retrieve it.

After travelling another 7.5km (4 miles) we arrived at the village of Karangan, our stop for the night, at nearly 6pm. This was at elevation 1,460m (4,780ft). At Karangan, we were shown to the 'guest house' where we spread our sleeping bags on the wood floor. The house was very clean. Its construction was typical of most village houses except for its larger size. It was on 2.2m (7ft) stilts, with floor and walls of rough lumber, with cracks between each board, and with a sheet metal roof, a design which allows for air circulation and ventilation – a practical consideration in that hot and humid climate. Dogs, chickens and an occasional goat are kept below the house. Perches are attached under the eves outside the door (which are typically only 1.7m [5½ft] high) for tethering the family's fighting cocks.

Running water is supplied by a 1.5cm (½in) plastic line running down the side of the mountain from a spring and ending in a bucket in the corner of the house. Food is cooked above an open wood fire on a raised hearth covered with dirt. There is no chimney, the smoke escaping through cracks in the wall. A kerosene lantern, which we surmise was only used for guests, provided light while we ate and prepared for bed. There was virtually no furniture except for a table that was used for food preparation and an open cabinet where clothing and other household items are stored. Rice was stored in sacks on the table along with vegetables. Corn was hung from the eaves to dry.

The nearby river served as a bathroom and as a place to wash both body and clothes. The village children were delighted to see the 'tourists' bathing in the river. Although we could not see them, except as they darted from bush to bush along the bank, we could hear their giggles! We were an unusual sight and they made the most of it. The trail from Karangan to the summit was not suitable for the pack horse so three young men were hired as porters. It led up the steep slope of Mt Rantemario through the village coffee plantation, corn and squash fields and across three difficult stream crossings. The farms were soon replaced by jungle as the trail entered the Reserve. We rested whenever we could both on the trail and at small areas, called POS (for Post), which had been cleared in the jungle at seven locations up the mountain.

Rhododendron flowers were first seen on the trail beginning at 1,850m (6,000ft). No plants were in evidence and we surmised they were high in the jungle canopy. The first was found at 2,100m (6,880 ft). It had large leaves and seed pods but no flowers. The second rhododendron found was an epiphyte which we believe to be *R. celebicum*. Between this elevation and 3,200m (10,480ft) at POS 7 where we set up our tents and camped for the night, we photographed 12 rhododendron species. Among them we have tentatively identified: *R. celebicum, R. radians, R. poremense, R. psilanthum, R. leptobrachion, R. quadrasianum, R. pudorinum, R. malayanum* (a pink and a pale yellow form) and *R. lagunculicarpum* (yellow and orange forms).

Among the many plants of *R. malayanum* at POS 5 we found a very different plant. This plant had few scales on broader leaves as well as darker coloured

flowers. It could either be a hybrid of *R. leptobrachion*, which was found nearby, or a different species. The pale yellow form of *R. malayanum* has not previously been described. Before we had identified *R. malayanum*, we called it 'many scales' for the abundance of rust-coloured scales found on all parts of the new growth and on the underleaf at maturity.

Rhododendron lagunculicarpum, which were 5–6m (15–20ft) tall treelets, became the dominate foliage between 2,700 to 3,000m (9,000– 10,000ft). This is a striking yellow- to orange-flowered plant with orange ovate new growth covered in scales (see fig. 19). There was also a very large red-flowered plant with trusses of 8–15 flowers we believe to be *R. leptobrachion*.

This was a long and difficult day as we had climbed 1,740m (5,700ft) over the very steep and rough trail. At many places we had to find hand holds to pull ourselves up over rocks, mud and roots. The only things that kept us going were the excitement of finding so many rhododendrons, the frequent stops to photograph our finds and the promise that the next rest stop would be a better place to camp for the night. The weather was clear and the temperature had cooled down to 24–26°C (75–79°F) by the time we had reached POS 7 at elevation 3,200m (10,480ft). The weather began to deteriorate by nightfall with a heavy mist and then some light rain as we pitched our tents and ate dinner. After a rainy night in our tents, we climbed the 245m (800ft) to the summit under partly sunny skies. On the way we photographed three more species of rhododendron. These were *R. nanophyton* var. *nanophyton*, *R. pseudobuxifolium* and *R. eymae*. *R. nanophyton* var. *nanophyton* was the smallest dwarf seen with leaves less than 5mm (¼in) long and scaly, tubular, orange-red flowers 1.4cm (½in) long. *R. eymae* is a beautiful dwarf with deep yellow, funnel-shaped flowers in trusses of two to four and with very small (1cm/⅜in) very recurved, heavily scaled leaves. *R. pseudobuxifolium* is remarkable for its scarlet flowers which are large in relation to its ovate leaves (see fig. 20).

After taking photographs and looking around at the summit, we returned to our camp at POS 7 for lunch. We then crossed the nearby stream to explore the side of the mountain below the summit. The dwarf buffalo 'Anoa' (the size of a wild dog) was not seen, however, we did see droppings and where they had prepared beds. Several locations were also noted where the ground had been disturbed; either by the Anoa, wild pigs or the native pig deer 'Babirusa'. On this excursion, we found what we believe to be a variety of *R. nanophyton* along with many orchids and other alpine-flowering plants.

During the night of 16 May the weather turned rather nasty with lightning, thunder, rain and high winds. Because of concern for what we knew would be a treacherous descent and with no assurance that the weather would improve, we decided to abort our planned ascent of adjacent Mt Sinagi and return to Karangan. We began our descent early the next morning in the rain and were soon slipping and sliding down the steep muddy trail. Although we each fell several times, there was no serious damage and we reached POS 2 at dusk.

Several stops were made along the way when we spotted rhododendrons. During

the descent we saw 12 species, at least four different from those seen on the ascent. These four species have been tentatively identified as *R. impositum, R. lomphohense, R. rhodopus* and *R. bloembergenii*. That night was spent on a narrow rock ledge 15m (50ft) almost directly above a river. It was protected by a large cliff overhang that provided shelter from the rain but there was little space for sleeping. Because of concerns about rolling off the ledge into the river we were more than a little restless during the night! Staying awake, however, did allow us to see bats, lightning flashes and fireflies, and the roar of the river muffled the sound of the thunder.

We continued down to Karangan the next morning where we cleaned up before proceeding to Gura with the porters. The walk was through a heavy downpour for most of the way. The slide area at Buntudeo was bypassed by going hand over hand straight up the steep hillside through a coffee plantation and then through grass and brush to the top of the ridge until finally, after a jump from a 3–4m (10–12ft) bank, we reached the muddy road. The remainder of the walk to Gura was uneventful except for crossing one stream that had overflowed the road and stopping a couple of times to clean the mud from our boots and clothes under roadside springs. By the time we reached Gura the rain had stopped, we were relatively dry and the temperature was back around 31°C (88°F).

At Gura, we caught the last transportation for the evening down the mountain to Cakke and then on to Rantepao. It was a public 'Bemo' (heavy duty Toyota station wagon) and was full of passengers going to Cakke for market the following day. It proved an interesting ride down the bumpy narrow road as 20 people and considerable baggage had been crowded into and onto the vehicle.

The return to Ujung Pandang was via Palopo, down along the Bay of Bone, across to Pare Pare and then south. After wrapping up our affairs, the next day we caught a plane to Bali. Following one night in the resort town of Kuta we took a bus to the town of Ubud, the centre of Balinese arts and crafts. While there we enjoyed two days sightseeing, visiting the market, a silversmith, mask maker, wood carving shop and numerous artist's galleries. Our return to Seattle was via Kaoshiung and Taipei, Taiwan. We arrived home on 24 May after an 11-hour flight from Taipei.

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Rhododendron, Camellia and Magnolia Notes

Magnolia 'Vulcan' in England

I read Piet van Veen's letter in the 1998 Year Book about this plant with considerable interest.

My own plant of *M.* 'Vulcan' is a graft also acquired in 1994. It has not grown as rapidly as his plant in Switzerland but has reached about 4m (12ft) high and 2m (6ft) wide – an attractive symmetrical tree. It has always been very floriferous and carried over 100 flowers in 1998. However I too found the flowers disappointing, both in size, as described by Mr van Veen, but also in colour – this being a dingy pale purplish pink.

However in 1998 the topmost two flowers on the tree, which were the first to open, *were* much bigger, and opened to the classic 'cup and saucer' shape of *M. campbellii* subsp. *mollicomata* 'Lanarth'. As the tree continued to flower it was interesting to note that the later flowers and those nearer the ground became gradually smaller and duller.

The colour of the best flowers was also much better, not achieving the red seen in photographs from New Zealand and probably paler than the flowers in Switzerland (as is often the case in the UK with the deeper coloured magnolias). To my eye the colour was midway between *M. campbellii* subsp. *mollicomata* 'Lanarth' and *M. liliiflora* 'Nigra', as might be expected, and was deep purplish pink rather than red, but unique and attractive. The colour was carried both on the inside and the outside of the tepals

It is clear to me that *M.* 'Vulcan' is a plant well worth growing in UK conditions even if the wait for flowers of a good size, shape, and colour is a little longer than expected. My guess is that the flowers will come to resemble *M. campbellii* subsp. *mollicomata* 'Lanarth' but without the blue tones. One just hopes that the best ones will not always be at the top of the tree.

MIKE ROBINSON, SUSSEX

An old hardy hybrid rediscovered

It is excellent news that the Group is to create a collection of old hardy hybrid rhododendrons. The value of assembling such a collection is pointed up by the recent discovery in a Sussex garden of a very attractive 130-year-old *R. campanulatum* hybrid known as 'Distinction'. In the same style as 'Susan', the *R. campanulatum* influence can be clearly seen in the photograph (see fig. 26), where it is compared to John Fox's prize-winning exhibit of the species at the 1998 South East group show. Leach lists it as in cultivation in the Edinburgh nursery of T Methven in 1868. The Sussex plant was ordered just after the Second World War at an RHS Vincent Square show from R W Wallace and Co. of Tunbridge Wells for one

guinea (up from an average price of around 12/6d). It was spotted and propagated by John Moaby who manages the Coblands Broadwater Forest Nursery near Eridge in Sussex, where he has put together a collection of rhododendrons that contains around 300 hardy hybrids, some rare and some not even in the current literature.

Rhododendron 'Distinction' is reported as a reliable flowerer in early May. In some seasons 'you won't see a leaf for bloom' and in others the contrast between the pale lavender flowers and the dark bluish foliage is most attractive. It certainly sounds less fastidious than the species while retaining some of the latter's character; perhaps such qualities may help to bring hardy hybrids back into fashion.

MAURICE FOSTER, KENT

Camellia granthamiana – the man behind the name

A picture of Sir Alexander Grantham (see fig. 25) has been sent to me from Hong Kong, and it occurs to me that it might be of interest to *Camellia* specialists as Sir Alexander Grantham was the Governor for whom *Camellia granthamiana*, which is endemic in Hong Kong, was named. At the time of writing it is in full bloom here (2 December 1997, Switzerland).

During the 1950s I was Parliamentary Private Secretary in the Colonial Office. At one point Governor Grantham was completing his second term as Governor. So popular and successful was he as Governor that a massive petition was presented by the people of the Colony to the Secretary of State asking for Sir Alexander to be given yet another term in office, though this did not in fact come about. He was a very great public servant.

However, the massive petition, between clear plastic covers, used to lie on the table in the Secretary of State's office. If some visiting Governor of another colony had been in for a talk about the affairs of his territory, the Secretary of State would sometimes say to him as he walked past the petition, 'Just look what Governor Grantham got!'. It was intended to encourage others.

Our Grantham's camellia stands about 4.5m (14ft) tall and flowers with regularity in late November or December but unlike other camellias here which sow themselves and regenerate naturally, it has never set seed. Perhaps there are not enough pollinators around in winter. But, like the Governor, it has never given any trouble and is universally admired.

When I looked for this camellia on The Peak in Hong Kong some years ago I could not find a wild plant though I did see a specimen in a private garden. The *New RHS Dictionary of Gardening* states that one tree survives in the wild.

SIR PETER SMITHERS, SWITZERLAND

The Rhododendron Group Tour, Dumbarton and Argyll, 9-13 May 1998

Bruce Archibold

On Friday 8 May members of the Group gathered at the Commodore Hotel in Helensburgh for the start of the annual tour. This hotel has been used as a 'base camp' on several occasions.

The first morning of the tour dawned fresh and bright and, after breakfast, we drove to Glenarn where we were welcomed by Mr and Mrs Michael Thornley. Mr Thornley gave us a comprehensive history of the garden from the mid-1830s, however the main planting of rhododendrons did not start until about 1926–27 when Archie and Sandy Gibson took over and received seed from the Ludlow and Sherriff collections of 1930. The garden eventually (1982) came into the possession of the Thornleys who had a mammoth clearing up task to do before the present state of careful and caring preservation was achieved. It is not easy to pick out individual plants in a garden of such great content but one that immediately came to notice was *R. viscidifolium* of subsect. Thomsonia, notable for its copper-coloured flowers and, as its name implies, sticky foliage. This is a rare plant of hardiness 3–4 certainly seldom seen south of the border. The big-leaved rhododendrons were well represented with fine examples of *R. grande, R. hodgsonii, R. sinogrande* and *R. falconeri,* together with the more unusual *R. sidereum.* In addition there were *R. macabeanum* × *falconeri* hybrids which do not appear to have attracted clonal names. Other noteworthy plants were *R. neriiflorum* and *R. campylocarpum* and three with outstanding indumentum being *R. tsariense, R. pachysanthum* and *R. elegantulum.* We all gathered outside the conservatory for a fine lunch prepared by Mrs Thornley senior at the end of which we expressed our thanks, avoiding the charge of 'coals to Newcastle', by presenting a plant of *Stachyurus praecox,* a shrub with waxy racemes of yellow flowers in March.

Scottish Rhododendron Society Show

After lunch we made our way to the Victoria Hall in Helensburgh where the Scottish Rhododendron Society were holding their annual show and it was a pleasure to meet old friends such as Peter Cox and Mervyn Kessel. The standard of the exhibits in the show was extremely high and, in all honesty it must be said, far excelled anything that has been seen recently at Vincent Square. The number of exhibitors was not great as is shown in the fact that the winners of the

first 15 classes were Glenarn 4, Brodick 5, Glendoick 3 and Arduaine 2, with one unnamed. We returned to the hotel for tea, afterwards coming back to the Victoria Hall for a lecture, accompanied by slides, by Ian Sinclair – lately at Benmore – on an expedition to Yunnan. The content of the lecture and the quality of the slides were so good that we could happily have listened and watched much longer, but Ian had another appointment. We were grateful to Tessa Knott, Chairman of the Group's Scottish Branch, for arranging the lecture, and it was a pleasure to meet members of that branch.

Crarae

The next morning we travelled by coach west to Crarae where we were met by Sir Ilay Campbell who suggested that we split into two parties, having given us a short history of the garden (see *Rhododendrons 1986–7*, pp.17–18). This garden, while rightly being known for its fine collection of rhododendrons contains many other interesting genera. The first of these that greeted us was *Meconopsis* × *sheldonii* (*grandis* × *betonicifolia*) which has been effectively planted to form a serpentine river of the deepest blue cascading down the hillside. Lucky indeed the garden that can grow these lovely plants so well. Mention should also be made of a large and thriving planting of *Eucalyptus* sp. (*niphophila*?) and a fine collection of *Nothofagus* in addition to a very varied planting of conifers – many rare. Our guide who set off up the hill at considerable pace exercised not only our legs but also our minds by conducting a 'name the plant' game by standing in front of the name labels. As most of these were conifers and other genera we all probably qualified for the old school report tag – 'could do better'.

The big-leaved rhododendron species flourish in the sheltered areas where *R. montroseanum* was impressive, as were some *R. sinogrande* × *R. falconeri* hybrids and a possible *R. macabeanum* × *R. lacteum*, one of the more unusual crosses. There were, of course, a great number of smaller species, too many to name comprehensively, but mention should be made of *R. piercii* with its fleshy crimson flowers, thick indumentum and attractive rugose leaves, *R. campylocarpum* for a good yellow, and *R. thomsonii* for its combination of deep red flowers, lovely bark and the bonus of ornamental calyces after petal-fall. We were to see a larger *R. niveum* later in the tour but the deep magenta colour and compact truss here must take some beating.

Returning toward the new reception area we passed scattered plants of *R. albrechtii* and *R. schlippenbachii*, both of sect. Sciadorhodion but only the former with a sweet scent. Fortunately both parties arrived together in time to thank Sir Ilay and to present him with a plant of *Acer caudatifolium*.

Stonefield Castle Hotel

We carried on down the west bank of Loch Fyne to the Loch Gair Hotel which provided us with a fine lunch before driving the final stretch to the Stonefield Castle Hotel where we were to spend the night. A full report on the garden appears in the *Rhododendron and Camellia Yearbook 1956* by J Macqueen Cowan (pp.16–21) and makes very interesting reading. Some of our party had stayed at the hotel in the past and set out to find

rhododendrons which were known to have been grown from original introductions by Hooker. It was quite easy to find the first, which is a huge plant of *R. niveum* gracing the front lawn with a wonderful display of tight-trussed magenta flowers (see fig. 32). The second was another huge plant, this time of *R. arboreum* subsp. *cinnamomeum* (incidentally wrongly labelled *delavayi*). Sadly time was too short to carry out a detailed search although we noted a number of big-leaved species such as *R. falconeri* and its subspecies *eximium*, *R. sinogrande*, *R. rex* subsp. *fictolacteum* and *R. sidereum*, but rampant natural regeneration has resulted in a large crop of hybrids of doubtful parentage. *R. campanulatum* seems to have been equally free with its favours which have resulted in some odd hybrids.

Baravalla

The following morning we drove the short distance along a single-track road to the wild garden of Baravalla planted out by Peter Cox and Sir Peter Hutchison. The original 8ha (20 acres) on the shores of West Loch Tarbert have recently been increased by the addition of a strip of land which widens the planting scope by the inclusion of a small burn. The soil is not ideal and there are patches where drainage is a problem but there are useful outcrops of rock which have been incorporated into the planting scheme which commenced in 1969. The rhododendrons are mainly from material collected in the wild by Cox and Hutchison (see *RHS Rhododendron Handbook 1998* p.256 *et seq*, and p.337 for Sino British Expedition to Cangshan). We were met by both Peters and split into two parties, each of which took off in a different direction. It was extremely interesting to see collections of the same species planted together and to note the differences that occur. One is almost tempted to say that there is no such thing as a typical example of a species.

Among the big-leaved species *R. pudorosum* created interest as it is not very often seen, but it was among these plants that it became obvious that there is still a great deal of work to be done by the taxonomists perhaps, in some measure, due to the ease with which they interbreed. Both *R. semnoides* and *R rothschildii* were present, both of which are possible natural hybrids (*praestans* × *arizelum*). We were shown also *R. protistum* which should flower pink but this one flowers yellow. We passed to the Triflora Glade which was a mass of colour with *R. triflorum*, *R. yunnanense*, *R. oreotrephes* and *R. davidsonianum* in full flower. This was one area in which the effects of waterlogging were evident and extra drainage was incorporated.

Nearby was a collection of subsect. Cinnabarina including the Purpurellum and Blandfordiiflorum Groups looking very healthy and showing that they can be grown despite the effects of powdery mildew to which they are so prone. We came across the low-growing *R. sulfureum* with its wee yellow flowers, a very floriferous *R. selense* var. *jucundum* of a good deep pink and *R. beesianum*, not the easiest of rhododendrons in cultivation, and its co-member of subsect. Taliensia, *R. traillianum*. Another interesting plant was *R. pingianum*, of quite recent introduction and appearing to be very close to *R. argyrophyllum*. *R. thayerianum* of the same subsection was apparent with its stiff

upward-pointing leaves but unfortunately not in flower. However, the sight of a 30cm (12in) high plant of *R. mallotum* which was sporting a single flower truss brought amusement and indeed wonder. It was also interesting to see how small boulders have become covered to a depth of 8–10cm (3–4in) with moss and these have been used to grow some of the more dwarf species.

Both parties joined together at a small marquee where gratefully received refreshments were provided by our hosts who were suitably thanked and presented with a plant of *Magnolia* 'Yellow Bird' which is, arguably, one of the best yellows to come from the Brooklyn Botanic Garden. It is a cross of *M.* × *brooklynensis* (*liliiflora* × *acuminata*) and *M. acuminata* var. *subcordata* made by Doris Stone in 1967. We then returned to the hotel for lunch where we were joined by our hosts of the morning.

Arduaine

After lunch we set off north to the Loch Melfort Hotel which is situated at the landward end of Loch Melfort and has fine views out to sea. As this hotel was unable to accommodate the whole party, seven of us were banished to the Cuilfail Hotel in Kilmelford a mile or so further north. Arduaine is quite close to Loch Melfort and those staying at the hotel decided to visit the garden that night. The first plantings were made in1903 when James Arthur Campbell made his home at Arduaine House; he was much influenced by Osgood Mackenzie of Inverewe with whom he was friendly. Shelter belts were planted and after Campbell's death in 1927 his son Bruce carried on the work employing six gardeners and others.

By the 1960s any work on the garden ceased and it fell into decay. At this time Arduaine came into the hands of the Wright brothers, Edmund and Harry, who took on the mammoth task of clearing the weeds and building up the collection of rhododendrons to one second to none. With this done, and to secure the future of the garden, it was handed over to the National Trust for Scotland with whom it now remains. Sadly Harry died recently. Although the future of the garden is now assured it must never be forgotten how much is owed to the efforts of the Wright brothers.

The peaceful surroundings and lovely content made Arduaine a grand spot for an after-dinner stroll with time to digest the many rarities which abound. Perhaps one of the best known is *R. arboreum* subsp. *zeylanicum*, a plant of great size which is tender elsewhere. The walk up the hill at the back of the garden revealed such rare delights as *R. exasperatum, R. glischrum* subsp. *rude, R. glischroides* and, returning to lower levels, *R. genestierianum* with its unusual dark plum-coloured flowers, tender in all but the most favoured locations. The same applies to *R. xanthostephanum,* which flourishes here with a mass of yellow flowers, and to members of the Maddenia subsection – such as *R. ludwigianum* (see fig. 31) – and *R. edgeworthii* which fill the air with their fragrance.

The Cuilfail Hotel party was fortunate, on returning from the last garden (see below) to be given a conducted tour by Arduaine's Head Gardener, Maurice Wilkins, whose enthusiasm and knowledge explains to a large extent the fine condition in which the garden is maintained and it was reassuring to hear of his plans for the future.

Achnacloich

Our final port of call on the following morning was the garden at Achnacloich situated on the south side of Loch Etive just east of the Connel Bridge. The Group has visited this garden twice before (*Rhododendrons 1979–80*, p.412 and *1993* p.70). The views from the garden both up and down the loch are superb. Our coach driver showed great skill in negotiating the narrow entrance gate which left little more than 5cm (2in) clearance on both sides, but much to the relief of all concerned (mostly the driver!) the coach squeezed through.

On arrival our organizer, Valerie Archibold found the owner, Mrs Nelson, whom she had met on a previous visit and who readily agreed to show us round the garden herself. Although the garden is of comparatively recent origin having been started in 1950, it is full of mature trees and shrubs and we were almost immediately confronted by a very large rhododendron with white flowers and leaves with a very conspicuous white indumentum. At first Mrs Nelson could not recall the name but it was tentatively (in view of the white flowers) suggested that it might be *R. argyrophyllum*. Mrs Nelson confirmed that it was. We were shown a large plant of *R. wightii* which must have been of early introduction since it still had the one-sided truss once thought to be indicative of the species. On the drive were two very eye-catching rhododendrons, *R. neriiflorum* and *R. campylocarpum*, both of which were covered with blossom, one red and one yellow, the one setting off the other. Nearby was a rhododendron not often seen, *R. hunnewellianum*, with its narrow oblanceolate leaves and whitish indumentum. While in this area small movement among the trees revealed the presence of a red squirrel, so much more attractive than the invading and invasive grey. Once again we were to find a good *R. thomsonii* with all its attributes but, although it had been present on a previous visit, a search failed to reveal *R. baileyi*.

Apart from the rhododendrons there were some interesting trees such as the tender *Sorbus harrowiana*, *Telopea truncata* (in flower) and several *Nothofagus* species. There are, of course, many more fine plants in the garden but time was pressing and, having thanked Mrs Nelson we left for Oban and a short shopping break. On returning to the hotel we once again went to Arduaine as reported above.

The following morning saw the end of the tour and, sadly, the end of Valerie Archibold's tenure of office as Tours Organizer which started in 1984. Her tours have encompassed so many excellent gardens, and all have been arranged entirely on her own with quiet efficiency and confidence which clearly showed in the end product. She will be sadly missed but will put in a final appearance at the Autumn Weekend in Sussex.

BRUCE ARCHIBOLD *is a member of the RHS Rhododendron and Camellia Committee and is the immediate past Chairman of the Group*

The Rhododendron and Camellia Competitions

The Early Rhododendron Show
17–18 March, 1998

The support from exhibitors for The Early Rhododendron Show was very poor indeed, and all the more disappointing after the much improved and increased support given to the corresponding competition at the 1997 show after several very lean years before that. It had been hoped that the upsurge of interest would be continued, especially after a very mild spell of weather in February with little or no frosts to damage the early flowers as can so easily occur at this unpredictable and variable time of the year. If it had not been for the exhibits from The City of Swansea there would have been no show at all. Not for the first time did Swansea come to the rescue and Julie Bowen is to be congratulated on her staging of exhibits from The Clyne Gardens, continuing the displays formerly arranged by her predecessor Ivor Stokes. Of the total of 43 entries no fewer than 30 were from Swansea.

Class 1, for three species – one truss of each, had two entries from Swansea with first prize going to *R. hookeri, R. floccigerum* and *R. argipeplum*, and second prize for *R. macabeanum* KW 7724, *R. sutchuenense* and *R. arboreum*.

Class 2, for a spray of a species, again saw Swansea winning first and second prize with *R. macabeanum* and *R. montroseanum*. Third prize was awarded to Nigel Holman for his *R. spinuliferum*.

Class 3, for one truss of any species, had Swansea's *R. macabeanum* gaining first place over their *R. arboreum* with third prize going to Brian Wright for his *R. macabeanum*.

Classes 4, 5, 6, 7, 8, for various subsection species – one truss of each; the only entries were from Swansea and all gained prizes (10 in total).

Class 9, had no entries.

Class 10, for a spray from a host of 16 subsections, had but two entries both of *R. lutescens* with first prize to Swansea, second to Brian Wright.

Class 11, for a truss of any species not covered in any of the foregoing classes, had Swansea showing *R. tanastylum* KW 8044 and *R. irroratum*.

Class 12, had no entries.

Class 13, for one truss each of three hybrids, saw Swansea with the only entry consisting of 'Glory of Penjerrick', 'Janet', and 'Pink Delight' for first prize.

Class 14, for a spray of any hybrid, had two entries with first prize to Swansea for 'Rosamunde' but only a Commended for a no-name hybrid with very heavy spotting in the flowers (not unlike 'Polka Dot'). Its exhibitor John Subtil, a newcomer to the show scene, must have been disappointed to find that his well-staged exhibit was

so lowly rated by the judges.

Class 15, for one truss of any hybrid, gave the judges the task of placing the three entries from Swansea in prize order with no comment at all on the two other entries in this class from another newcomer Cassleton Elliott.

Class 16, for a hybrid of which one parent must be from a list of a host of nine subsections species, again had the three entries from Swansea placed in prize order. These were 'Media Grex', *R. niveum* × *R. eximium* (see fig. 28) and 'Pink Delight'.

Class 17, for a truss of a hybrid of which one parent is from subsect. Fortunea, was won by Swansea with 'Geraldii' with again the only other entry from Cassleton Elliott being awarded Commended with no explanation from the judges as to its lowly rating. Surely not the way to encourage new entrants.

Class 18, for a truss of any elepidote hybrid, of which neither parent may be from a list of 10 subsections species, was only supported by Swansea (as so often in recent years) with their splendid primary crosses between species of the Grandia and Falconera subsections. This year they showed *R. macabeanum* × *R. sinogrande* for first prize and *R. hodgsonii* × *R. eximium*.

Classes 19 and 20, had no entries.

Classes 21 and 22, for tender species or hybrids grown under glass or otherwise, were contested as so often in recent years by the two Drs Jack and Dayton. The former winning the one truss class with *R. veitchеanum* and second for *R. ciliicalyx*, while the latter won the spray class with *R. burmanicum*. It is interesting to note that of all the classes that were contested, these were the only two in which Swansea made no entry.

If disappointment was expressed about the competition then the opposite should be said about the splendid display of Vireya rhododendrons organized and arranged by the Royal Botanic Garden Edinburgh, with sponsorship from the RHS Rhododendron, Camellia and Magnolia Group (see fig. 30). It is several years since such an exhibit was brought to Westminster by the RBG and there have been many new introductions from the wild and new hybrids made in the intervening period. A number of these were on show for the first time and gave visitors to the show an idea of the very different appearance and habit of these tropical plants compared with the more traditional concepts of the genus *Rhododendron*. Many have tubular-shaped flowers and this relates to the method of their pollination – humming birds in this case. The colour of the flowers is also more vibrant, reflecting the high light intensity in their natural surroundings. Although many of the plants were not in flower they displayed the diversity of foliage which one associates in general with the genus *Rhododendron*. The exhibit was beautifully and most artistically arranged, using moss-covered tree branches on which some Vireyas grow epiphytically. The award of a gold medal was well deserved.

Among so many outstanding plants the following were particularly noted: *R. aurigeranum*, with bright yellow flowers; *R. praetervisum*, with very long purple tubular flowers *R. rouseii*, a new species with small white flowers; *R. rubineiflorum* × *R. inconspicuum*, smothered with small red flowers; *R. saxifragoides*, with completely prostrate habit; *R.*

Fig. 25 (left): Sir Alexander Grantham GCMG, Governer of Hong Kong 1947–57, after whom Camellia granthamiana *is named* *(see p.65)*

Fig. 26 (below): An old R. campanulatum *hybrid,* R. *'Distinction' (top of photograph) is compared against a flower from John Fox's prize winning* R. campanulatum *(see p.64)*

Fig. 27 (left): Camellia *'Interval' which won first prize in Class 20 at the Main Camellia Show*

Fig. 28 (below): A fine R. niveum × R. eximium *entered at the Early Rhododendron Show by Clyne Gardens, Cardiff (see p.72)*

Fig. 29 (right): Dr R Jack's Vireya R. christianae *which won Class 29 at the Main Rhododendron Show* *(see p.73)*

Fig. 30 (below): Part of the magnificent Gold Medal winning exhibit of Vireyas by the Royal Botanic Garden, Edinburgh, and sponsored by the Rhododendron, Camellia and Magnolia Group. Visible here are the orange R. laetum × zoelleri *in the centre of the picture, the yellow* R. sessilifolium *peeping out just above,* R. macgregoriae *in the foreground and the red* R. vitis-ideae *to the right* *(see p.72)*

Fig. 31 (top): R. ludwigianum *at Arduaine (see p.69). Fig. 32 (left): A superb* R. niveum *at Stonefield Hotel (see p.68). Fig. 33 (above):* Magnolia *'Yellow Bird (see p.42)*

searleanum, with delicate, white-flushed pink tubular flowers and the orange flowering *R. laetum* × *zoelleri*.

DAVID FARNES

The Main Rhododendron Show: Species 29–30 April, 1998

Last year I had to report our disappointment that the weather had been instrumental in reducing entries considerably; this year was a repeat performance. Frost and hail forced a number of exhibitors to withhold or withdraw entries. Our sincere thanks to those who did manage to exhibit and it must be said that, overall, although lacking in numbers, the quality was very good, and a great deal of interest in the competition was shown by visitors to the show. We hope for better weather next year.

Class 2, three species, one truss of each. First prize went to High Beeches Conservation Trust with *R. rex*, *R. arizelum* and *R. wightii*, all clean and well presented. Second prize to Exbury Gardens with an exhibit that just failed to reach first position of *R. euchates*, a very good *R. coriaceum* and *R. niveum* which was not quite fully developed.

Class 3, any species, one truss. The Mclaren Challenge Cup went to Mr Gilbert from Cornwall with a perfect truss of *R. thomsonii*. Second prize, High Beeches with *R. rex*. Third prize, the Isabella Plantation, Richmond Park, with a very pretty *R. fictolacteum*, just beating a good *R. niveum* from Exbury.

Class 4, any species, one spray – sadly only one entry, but worthy of the Roza Stevenson Challenge Cup, from Exbury with a rich pink *R. davidsonianum*.

Class 5, any species of subsect. Arborea or subsect. Argyrophylla, one truss – again only one entry, a good *R. niveum* from Exbury.

Class 8, any species of subsect. Grandia or subsect. Falconera, one truss. A truss of *R. coriaceum* from Brian Wright was placed just in front of a *R. fictolacteum* from High Beeches.

Class 11, any species of subsect. Taliensia, one truss. Dr Jack who came all the way from Scotland showed the interesting and uncommon *R. agganiphum* but came second to the *R. roxieanum* var. *oreonastes* shown by Brian Wright.

Class 13, any species of subsect. Pontica, one truss – a near perfect *R. hyperythrum* from Exbury was the only entry.

Class 20, any species of subsect. Triflora and subsect. Heliolepida, other than *R. augustinii*, one spray. Exbury exhibited a vase of *R. rubiginosum* to gain the only prize.

Class 21, *R. augustinii*, one spray. A well-staged vase of *R. augustinii* from Exbury, worthy of competition, was the only entry.

Class 27, any species of sect. Pogonanthum or subsect. Lepidota one spray. Mr Gilbert was the only exhibitor with *R. baileyi*.

Class 29, any species of sect. Vireya, one truss. Dr Jack is to be applauded for bringing from Scotland a superb truss of *R. christianae* (see fig. 29). Orange in colour.

Class 30, any species of deciduous azalea, one spray. First prize to a lovely clean *R. quinquefolium*, from High Beeches. Second prize to Exbury with *R. wadanum* – a species closely related to *R. reticulatum*.

As in 1997 Matthewmans of Pontefract staged an attractive stand of rhododendrons,

with the emphasis on compact and dwarf growing types suitable for the smaller garden. Prominent was *R.* 'Chikor', the charming miniature *R.* 'Sarled', the very deep red *R.* 'Ruby Hart' and *R.* 'Purple Pillow' – what a pleasing combination this would be with *R.* 'Chikor'. Perhaps the most interesting was the aptly named *R.* 'Lavendule', in colour and scented foliage.

ARCHIE SKINNER

The Main Rhododendron Show: Hybrids 29–30 April 1998

After last year's most disappointing event, one could have dismissed it and taken the philosophical view that another year would bring another show. If this was the case, it didn't help, as this year's competition was not a great deal better than last. True, there were about 14 more entries than last year but only four of the 27 classes attracted more than three entries with the Loder Cup class again being poorly supported with only nine entries.

Exbury, once again, provided the bulk of the exhibits and were rewarded by collecting the lion's share of the prizes – 19 of the 42 awarded – although High Beeches of West Sussex, the Isabella Plantation of Richmond Park, Surrey, and Brian Wright of Crowborough, East Sussex, were foremost in ensuring that Exbury did not have everything quite their own way.

In summary, the competition went as follows:

Class 32, six hybrids, one truss of each. First, Exbury with 'Galactic', 'Queen of Hearts', 'Gaul', 'Colehurst' (the Australian *R. fortunei* hybrid), 'Aztec' and an unnamed apricot-coloured hybrid with enticing, frilly-edged corollas which was subsequently awarded an AM. Second, High Beeches with 'Little Jessica', 'Queen of Hearts', 'Loderi King George', 'King George', 'Elsae' and 'Hullabaloo'.

Class 33, three hybrids, one truss of each. First, Brian Wright with 'Lamellen', 'Loderi King George' and 'W.F.H.'. Second, the Isabella Plantation with 'Naomi Hope', 'Beauty of Littleworth' and 'Idealist'. Third, Exbury with 'Kiev', 'Galactic' and 'Halfdan Lem'.

Class 34, any hybrid, one truss, for the Loder Challenge Cup. First, High Beeches with 'Elsae'. Second, Brian Wright with 'W.F.H.'. Third, Mr R Gilbert from Bodmin with 'Blewbury'. Fourth, the Isabella Plantation with 'Naomi Hope'.

Class 35, any hybrid, one spray. First, Exbury with 'Naomi Glow'. Second, Brian Wright with 'White Olympic Lady'.

Class 36, three hybrids bred and raised in the garden of the exhibitor. First, Exbury with 'Idealist', 'Queen of Hearts' and 'Prelude', a most attractive primrose flower which was the last of Lionel de Rothschild's famous crosses.

Class 37, Loderis, one truss. First, Exbury with 'Loderi Gamechick'. Second, High Beeches with 'Loderi King George'. The judges awarded only two prizes in this class which was rather ungenerous since Loderis are notoriously difficult travellers and not easy to stage.

Class 38, any subsect. Fortunea hybrid (not Loderis) one truss. First, Exbury with 'Luscombei Splendens', a good old Luscombe cross, clearly displaying its *R. thomsonii* parentage that goes back beyond 1880.

Second, Mr R Gilbert with the attractive *R. griffithianum* hybrid 'Yvonne'. Only two prizes were awarded.

Class 39, any *R. williamsianum* hybrid, one spray. First, Exbury with 'Moonstone Pink'. Only one prize was awarded.

Class 40, any subsect. Campylocarpa hybrid, one truss. No first awarded but a second was given to Exbury with 'Damaris'.

Class 41, any subsect. Neriiflora hybrid, one truss. First, Brian Wright with 'W.F.H.'.

Class 42, any *R. thomsonii* hybrid, one truss. First, High Beeches with 'Hullabaloo'. Second, Exbury with 'Luscombei Splendens'. Third, the Isabella Plantation with 'Lady Montague'.

Class 43, any subsect. Grandia or Falconera hybrid, one truss. First, Exbury with 'Colonel Rogers'.

Class 44, any *R. griersonianum* hybrid, one truss. First, Exbury with 'Matador'.

Class 45, any subsect. Taliensia hybrid, one truss. First, an unknown competitor with 'Blewbury'. Second, Mr R Gilbert with another 'Blewbury'. Third, Exbury with 'Galactic'. One must question whether the first and second entries were inadvertently from the same competitor, in which case one should have been NAS.

Class 46, any subsect. Pontica hybrid, one truss. First, Exbury with a most attractive unnamed pink resulting from *R. yakushimanum* × 'Lady Eleanor Cathcart'.

Class 47, any subsects. Arborea or Argyrophylla hybrid, one truss. First, Mr A W Simmonds from Ampthill, Bedfordshire, with the deep red 'Bibiani'. Second, Exbury with the same plant.

Class 49, any subsect. Maddenia or Edgworthia hybrid, one truss. First, Dr Robbie Jack from Lanark with 'Fragrantissimum'. Second, Mr A W Simmonds with 'Countess of Haddington'.

Class 50, any subsect. Triflora hybrid, one spray. First, Exbury with that very good Magor blue, 'St Breward'. Second, Brian Wright with 'Princess Anne'.

Class 52, any lepidote hybrid not covered by the above classes, one spray. First, Mr A W Simmonds with 'Dora Amateis'. Second, Brian Wright with 'Chikor'. No third prize was given but a fourth went to Exbury with another 'Dora Amateis'.

Class 53, any elepidote hybrid not covered by the above classes, one truss. First, Exbury with the *R. bureavii* hybrid, 'Hazel'.

Class 54, any elepidote hybrid not covered by the above classes, one spray. First, Exbury with a very fine 'Queen of Hearts' which was well worth top prize even though it was the only entrant in this class.

Class 57, any evergreen hybrid azalea, one spray. First and second, Exbury with 'Hinodegiri' and 'Addy Wery'. Third and fourth, the Isabella Plantation with 'Peco' and 'Louise'.

BRIAN WRIGHT

The Camellia Shows

The 1998 camellia season opened early and a beautiful display greeted those attending the February show, Ornamental Plants from the Open. Although all the blooms showed some damage, Nigel Holman's first and second placings were richly deserved. He also showed a lovely example of 'Grand Jury', a camellia not often seen in the competitions, and Trehane a very beautiful 'Ave Maria'. A truly uplifting start to a most generous season.

The Early Show 17–18 March, 1998

It was a delight to see Doreen Solley take first place in Division 1 Class 1 with 'San Dimas' and second with 'Furo-An'. Mrs Solley has been a splendid camellia grower for many years, and how rewarding to have her showing so successfully. There were nine entries in this class. Gary Liddle took third place with 'Woodsii' and Mrs E Bullivant fourth with 'Marguerite Gouillon'.

Class 2 attracted five entries. Marigold Assinder took first place with 'Jury's Yellow' and second with 'Debbie'. D R Strauss came third with another 'Debbie'.

In Class 3, again five entries. Mr Bettley came first with 'Cinnamon Cindy', a delightful small, dainty, double flower, white with a touch of pink – quite lovely – and D R Strauss took second place with 'Winton', another small, pink, dainty flower.

Division II section A attracted some very fine entries. Out of 10 classes the Duke of Devonshire won seven firsts. The overall quality of the blooms was quite exceptional. An especially fine example of 'Elegans' was shown by the Duke of Devonshire while A W Simons exhibited a lovely bloom of 'Augusto L'Gouveia Pinto' which did not show the distinctive blue/lavender tinge we have seen on other examples. In Class 15 Marigold Assinder exhibited a superb bloom of 'Margaret Davis' and David Davis in Class 14 showed a really lovely 'Kramer's Supreme' – said to be fragrant but probably needs more warmth to bring it out.

section B Class 20 to 27. Again there were very good entries and an opportunity to exhibit the spectacular flowers such as 'Dr Clifford Parks', 'Francie L', 'Lasca Beauty', 'Satan's Robe', 'Captain Rawes' and many others, creating a lovely show. The Duke of Devonshire, A W Simons, D R Strauss, Marigold Assinder, Mr Bettley and Brian Wright were all successful. It was good to see 'Donation' and 'Brigadoon' figuring in the top entries, and a lovely 'Water Lily' was shown by Nigel Holman.

section C. The yellows in Class 28 do not present the opportunity other classes give and were limited here to 'Brushfield's Yellow', shown by A W Simons who was awarded a first; 'Jury's Yellow' shown by the Duke of Devonshire, who gained a second, and 'Jury's Yellow' by Josephine Newman for a third. All these flowers are interesting but hardly exciting, as is the case of some of their more exotic relatives.

Class 29 called for one bloom shown by an exhibitor who had not won a first prize at a previous RHS show. This was richly deserved by Doreen Solley, who not only achieved a first with 'San Dimas' but proved herself to be a doughty competitor in other classes. We hope she will be inspired by her success and become a new regular contender.

The Main Camellia Show 14–15 April, 1998

A wonderfully mild if wet spring came to a shocking climax with snow greeting those attending the show and frosts eating hard into unprotected outdoor blooms, not helped by spells of torrential rain. Amazingly, a beautiful show was mounted by dedicated growers, although the change in the layout was not felicitous. It was not possible to enjoy the blooms at the rear of the staging nor to read the names, and it is to be hoped that the experiment will not be repeated.

The three most memorable blooms in

this show were of 'Yours Truly', 'Margaret Davis' and 'Commander Mulroy'.

The highlight of this show is the award of the Leonardslee Bowl, which is greatly coveted. It demands an entry of one bloom of 12 cultivars. There were seven entries (84 blooms). The Bowl was won by A W Simons of Bedfordshire, who entered 'Yours Truly', 'Valley Knudsen', 'Margaret Davis', 'Valentine Day', 'Interval', 'Lasca Beauty', 'Mrs D. W. Davis', 'Guilio Nuccio', 'Dr Clifford Parks', 'Owen Henry', 'Lila Naff' and one other whose name was missing. Second came D R Strauss of Sussex, who exhibited 'Commander Mulroy', 'Mathotiana Alba', 'Konron Ko-Ko', 'Virginia Robinson', 'Carter's Sunburst', 'Clark Hubbs', 'Kramer's Supreme', 'Faith', 'Souvenir de Bahuaud Litou', 'Charlean', 'Tiffany' and 'Lasca Beauty'. David Davis of Warwickshire came third. He exhibited 'Commander Mulroy', 'Nuccio's Jewel', 'Paolina Maggi', 'Senorita', 'Desire', 'Elegans', 'C. M. Hovey', 'Margaret Davis' (a most beautiful specimen with rich edge markings), 'Guilio Nuccio', 'Lady Clare', 'Satan's Robe' and 'Kramer's Supreme'. Of the other entries of special note were Exbury Gardens with 'Elegans Champagne' and 'Les Jury', a wonderful red bloom, and Marigold Assinder with 'Ville de Nantes'.

Class 11 required any six cultivars, one bloom of each, and there were seven entries. First came David Davis, who exhibited 'Nuccio's Jewel', 'Nuccio's Pearl', 'Guilio Nuccio', 'Shiro Chan', 'Margaret Davis' and 'C. M. Hovey'. Second came A W Simons with 'Aaron's Ruby', 'Mark Alan', 'Janet Waterhouse', 'Holly Bright', 'Red Cardinal' and unknown. Third Mr Betteley from Kent with 'Kick Off', 'Margaret Davis', 'Berenice Perfection', 'Bob Hope', 'Yours Truly' and a superb 'Drama Girl'. Fourth Exbury Gardens with 'Tricolor', 'Strawberry Parfait', 'Alexander Hunter', 'Adolphe Audusson', 'R. L. Wheeler', 'Madge Miller' and unknown. In his exhibit, while unplaced, Brian Wright had a wonderful bloom of 'Bob Hope'.

In the remaining classes the winning exhibitors continued their success and were supported by blooms from the wonderful cultivars already described. In addition, in class 22, Brian Wright was awarded first for 'E. G. Waterhouse', 'Anticipation' and 'Julia Hamiter', a second in class 24 for 'Brigadoon', and a first in class 26, again showing 'E. G. Waterhouse'.

The dedication and expertise of all who enter the camellia competitions is of the highest standard, and the wealth of beauty represented by the cultivars presented for exhibition is beyond compare. We are privileged indeed that this beautiful tree flourishes in selected areas of our island.

CICELY PERRING

Awards

Award of Merit

***Rhododendron* 'Black Sport'** (parentage unknown). AM, 18 May 1998, as a hardy flowering plant for exhibition. Truss of *c.*17 flowers, 140mm across. Corolla funnel-campanulate, 45x55mm, 5-lobed, uniformly deep purplish red (59B), dark red (187A) spotting on dorsal lobe extending from throat to within 10mm of margin, somewhat pubescent at throat on dorsal lobe. Stamens 10–12; filaments purple, pubescent at base; anthers dark purplish-black; ovary green with scattered pubescence. Calyx to 2mm, dark purple. Pedicel flushed red, pubescent. Leaves narrow elliptic, 100x30mm, dark green matt above, paler below, glabrous; petiole to 15mm, glabrous. Raised by Ben Nelson (USA). Exhibited by Mr E de Rothschild, Exbury Gardens, Exbury, Hampshire SO45 1AZ. Specimen and transparency in Herb. Hort. Wisley.

***Rhododendron* 'Captain Jack'** ('Mars' × *R. facetum*). AM, 18 May 1998, as a hardy flowering plant for exhibition. Truss of *c.*17 flowers, 180mm across. Corolla funnel-campanulate, 45x70mm, 5-lobed, uniformly strong red (46A) with very faint darker spotting on dorsal lobe. Stamens 10; filaments red, pubescent at base; anthers dark brown. Style glabrous, red; stigma dark red; ovary densely white tomentose. Calyx to 3mm, insignificant. Pedicel green, flushed red, with scattered branched hairs. Leaves elliptic, 150x50mm, matt green above, paler below with remains of brown tomentum adhering to veins; petiole to 35mm, glabrous. Raised by Rudolph Henny (USA). Exhibited by Mr E de Rothschild, Exbury Gardens, Exbury, Hampshire SO45 1AZ. Specimen and transparency in Herb. Hort. Wisley.

***Rhododendron* 'Lem's Tangerine'** (Margaret Dunn Group × ['Anna' × 'King of Shrubs']). AM, 18 May 1998, as a hardy flowering plant for exhibition. Dome-shaped truss of *c.*11 flowers, 180mm across. Corolla funnel-campanulate, 70x45mm, 5 wavy-edged lobes, vivid reddish orange (42A) in bud, opening to a paler vivid reddish orange (41A) that grades to brilliant orange (29A) in throat, vivid reddish orange (40A) flares extending 20mm from concolorous nectar pouches. Stamens 12; filaments white, pubescent at base; anthers dark brown. Style glabrous, green; stigma green with red stripes; ovary densely glandular. Calyx to 25mm, petaloid and irregular. Pedicel reddish and glandular. Leaves elliptic, 130mmx50mm, mid green above, paler below, glabrous; petiole to 35mm, glabrous. Crossed and raised by Halfdan Lem (USA). Exhibited by Mr E de Rothschild, Exbury Gardens, Exbury, Hampshire SO45 1AZ. Specimen and transparency in Herb. Hort. Wisley.

First Class Certificate

***Rhododendron* 'Nimrod'** (*R. irroratum* 'Polka Dot' × *R. calophytum*). FCC, 17

March 1998, as a hardy flowering plant for exhibition (AM 7 April 1987). Dome-shaped truss of *c.*22 flowers, 150mm across. Corolla funnel-campanulate, 50x50mm, with 5 wavy-edged lobes, strong purplish pink (63C) in bud, opening to white, heavily flecked inside with moderate purplish red (64A) spots on dorsal lobes which grade to strong purplish red (64C) on lower lobes, basal blotch strong purplish red (64B). Stamens 12–13; filaments white, pubescent at base; anthers brown. Style glabrous, white; stigma pale green; ovary green with short, red, glandular hairs. Calyx non-existent to rudimentary. Pedicel pale green, flushed strong purplish red (58B) on upper surface with short, red, glandular hairs. Leaves narrow elliptic, 180x55mm, apex acute, base rounded, mid-green and slightly glossy above, paler below, glabrous; petiole 15–20mm, glabrous. Raised by Mr E. de Rothschild. Exhibited by Mr E de Rothschild, Exbury Gardens, Exbury, Hampshire SO45 1AZ. Specimen and transparency in Herb. Hort. Wisley.

Rhododendron cinnabarinum* subsp. *xanthocodon. FCC, 18 May 1998, as a hardy flowering plant for exhibition. Truss of *c.*7 flower, 70mm across. Corolla tubular-campanulate, waxy, 30x35mm, 5-lobed, uniformly brilliant yellow (11A). Stamens 10; filaments white, pubescent at base; anthers brown. Style green; stigma green; ovary scaly. Calyx 5-lobed, 2mm, green. Pedicel scaly. Leaves broadly elliptic, dark green and scaly above, glaucous beneath with scattered brown scales. Exhibited by Mr E de Rothschild, Exbury Gardens, Exbury, Hampshire SO45 1AZ. Specimen and transparency in Herb. Hort. Wisley.

Book Review

Camellias: the complete guide to their cultivation and use **by Jennifer Trehane, 1998 Batsford £30**

Blessed is he who expecteth . . . Well, if he expected something good in any camellia book under the name of Trehane he certainly will not be disappointed by Jennifer Trehane's erudite contribution to camellia literature.

The book is a complete guide containing everything the beginner, the experienced or thoroughly experienced gardener needs to know.

A book should be reviewed from a wider viewpoint than one's own. For example, Chapter 1 – The history of camellias – is excellent for the majority of readers but as I started propagating and growing camellias before the last war, it represents rather well trodden ground for me. I could have done with less of it. Against that Chapter 2 – Camellias in a botanical context – is intensely interesting. The author with her knowledge and experience of camellias in the wild should have expanded it to two or three times its length. She displays a deep insight and knowledge of the distribution and ecology of camellia species and takes us into the realm of familiar species and many others which are but Latin names for many of us. Superb illustrations of leaves, flowers and fruit complement the chapter. I look forward to a major expansion of this chapter in the author's next book.

Chapter 3 – Cultivation – covers every aspect of the subject. Any gardener following it could hardly go wrong. The necessity when moving established plants of cutting back (hard if necessary) the top growth to balance the reduced root system could have been more strongly emphasized. Most gardeners seem afraid to do so. Propagation is adequately covered but why illustrate cuttings with leaves cut (an open invitation to monochaetia fungus invasion) when elsewhere we are warned against it. Inclusion of the main chemical elements is most useful.

Chapter 4 – Using camellias in the garden – provides excellent ideas on planning, planting and complementary plantings, but enthusiastic collectors of evergreen azaleas could be upset to read their flowering period is eight weeks when most of us can cover four months. However, these are mere details.

Using camellias as hedges is well dealt with. As they can provide one of the most colourful and attractive hedges of any plant this is a really worthwhile section. Most garden writers appear to be totally ignorant about this.

With her knowledge, the author should have given us more information and suggestions for forward-looking breeding programmes. That great plantsman, Michael Haworth-Booth, did just this with hydrangeas. In her next book, the author must do the same for camellias followed by a

co-operative breeding programme by International Camellia Society members.

Chapter 6 – Problems, pests and diseases – is perfectly adequate and Chapter 7 – Varieties – provides detailed lists of camellia varieties. One assumes it is the author's personal choice and all the better for that. There's certainly something good here for everyone and every taste. My only disappointment is that, under Sasanquas, while dealing with Bob Cherry's wonderful Paradise strain, the superb new American range ('Snow Flurry', 'Winter's Interlude', 'Winter's Charm') is omitted as over a dozen are now available in the UK. Tested to –12°C (10°F), some for five succeeding years and coming through unscathed, they are a great addition and easy to grow in the UK.

Useful details on camellia nurseries, gardens etc., completes the book. It is beautifully illustrated in colour throughout inevitably increasing its selling price.

The publishers have marred the book by too many typographical errors and omissions and to have crammed the index on to two sheets is nothing short of criminal. These are details. This book is a fine addition to camellia literature and a 'must' for every camellia lover to buy.

LOGAN A EDGAR

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INDEX

(a) = *azalea*
(v) = *vireya*

Alnus nepalensis 14
Betula 50
Camellia
Aaron's Ruby 77
Adolphe Audusson 17
albosericea 29, 32
Alexander Hunter 77
Anticipation 77
Augusto L'Gouveia Pinto 76
Ave Maria 75-6
bailinshanica 29, 30, 35
bambusifolia 29, 30, 35
Bob Hope 77
Berenice Perfection 77
borelayunnanica 31
brevicolumna 29, 30, 35
brevigyna 28, 29, 30, 36
brevipetiolata 29, 36
Brigadoon 76, 77
Brushfield's Yellow 76
Capt. Rawes 76
Carter's Sunburst 77
Charlean 77
chunii 29, 30, 36
Cinnamon Cindy 76
Clark Hobbs 77
C M Hovey 77
Commander Mulroy 77
Debbie 76
Desire 7
Donation 76
Dr Clifford Parks 76, 77
Drama Girl 77
E G Waterhouse 77
Elegans 76, 77
Champagne 77
Faith 77
Francie L 76
Furo-An 76
Grand Jury 75
granthamiana 65
Guilio Nucci 77
heterophylla 25, 26
Camellia (cont.)
Holly Bright 77
huilensis 29, 31, 37
Interval 77
Janet Waterhouse 77
japonica 26
jinshajiangica 29, 32
Julia Hamiter 77
Jury's Yellow 76
kangdianica 29, 35
Kick Off 77
Ko Ko 77
Konron 77
Kramer's Supreme 76, 77
Lady Clare 77
lanositaba 29, 36
Lasca Beauty 76, 77
Les Jury 77
Lila Naff 77
L Wheeler 77
Madge Miller 77
mairei 26, 38
Margaret Davis 76, 77
Margerite Gouillon 77
Mark Allen 77
Mathotiana Alba 77
minor 29, 30, 36
Mrs D W Davis 77
Nuccio's Jewel 77
oleifera 46
oligophlebia 29, 37
Owen Henry 77
Paolina Maggi 77
pentapetala 29, 36
pentaphilacoides 28, 37
pentaphylax 29, 31, 37
phelloderma 29, 35
pitardii 25, 26, 27, 28, 31, 32
var.pitardii 26, 28, 32
var. yunnanica 26, 27, 31, 34, 38
Red Cardinal 77
reticulata 7, 25-33, 34, 38, 46
f. *simplex* 31
Camellia (cont.)
saluenensis 25, 26, 27, 28, 32, 34,
San Dimas 76
Satan's Robe 76, 77
Senorita 77
Shiro Chan 77
Souvenir de Bahuaud Litou 77
stichoclada 29, 31, 37
Strawberry Parfait 77
subliberopetala 29, 32, 38
tenuivalva 27, 29, 32, 34
Tiffany 77
Tricolor 77
Valley Knudsen 77
Virginia Robinson 77
Valentine Day 77
Ville de Nantes 77
Waterlily 76
Winton 76
Woodsii 76
xichangensis 29, 37
Yours Truly 77
Elaeocarpus 16
Eucalyptus niphophilla 67
Gentiana mellandrifolia 50
Huodendron 16
Hypericum hookeri 14
Luculia pinciana 46
Manglietia 49
insignis 44
Magnolia
acuminata 39, 40
× *denudata* hybrids 40-41
× *liliiflora* hybrids 41
Ballerina 11
Barbara Nell 42
× *brooklynensis* 40, 69
Butterflies 40
campbellii 11, 39
subsp. mollicomata 49
Lanarth 64
Coral Lake 42
Magnolia (cont.)
cordata 39, 40, 69
Crowley's Ridge 40
Curly Head 412
Daybreak 42
denudata 7, 39, 41
delavayi 46
Donna 12
Encore 11
Evamaria 41
Flamingo 42
globosa 49
Gold Crown 42
Gold Cup 43
Golden Gift 42
Golden Girl 42
Golden Glow 40
× Miss Honeybee 40
Golden Goblet 42
Golden Sun 40
Goldfinch 41
Gold Star 42
Green Star 8
heptapeta 9
see also *denudata*
Hot Flush 43
hybrids 3rd generation 41-43
hypoleuca 39
Ivory Chalice 41
Klassen 42
kobus 78
var. loebneri 8
var. stellata 8
Lanarth, see *campbellii subsp. mollicomata*
Legend 42
Leonard Messel 8, 11, 12
liliiflora 39, 41
see also *quinquepeta*
Nigra 64
× *loebneri* 5, 7-12
Maxine Merrill 42
Merrill 12
Miss Honeybee 40
Mister Yellowjacket 40
Neil McEachern 8

Magnolia (cont.)
Ontario 40
Peachy 42
Pink Surprise 42
Pirouette 12
Powder Blue 8
proctoriana 11
quinquepeta 9
rostrata 49
sargentiana 11
Scented Silver 8
sieboldii 39
sprengeri 11
Spring Snow 12
stellata 7, 8, 9-10
rosea 12
Sunburst 43
Sundance 41
Sun Ray 41
Syracuse 40
talauma 9
Ultimate Yellow 43
un-named hybrid 43
virginiana 9
hybrid 44
Vulcan 64
Woodsman 42
Yellow Bird 42, 69
Yellow Fever 41
Yellow Garland 41
Yellow Lantern 43
Meconopsis sheldonii 67
Nothofagus 67, 70
Pieris formosum 15
Rhododendron
Addy Wery (a) 40, 75
adenogynum 57
aganniphum 73
albrechtii (a) 67
Altaclerense (a) 22
ambiguum 56
annae var. *laxiflorum* 47
anthosphaerum 48
arboreum 71
subsp. *delavayi* 45
var. paramoenum 46-7
argipeplum 71
argyrophyllum 68, 70
arizelum 47, 49, 50, 73
hybrid 68
asperulum 49
augustinii 56, 73
Electra 52, 56, 57
aurigeranum (v) 72
Aztec 74
baileyi 72
balfourianum 57

Rhododendron (cont.)
Beauty of Littleworth 74
beanianum 57
beesianum 68
Bibiani 75
Bijou des Amateurs (a) 22
Black Sport 78
Blaumeise *(syn.* Bluetit) 53
Blewbury 74, 75
bloembergenii (v) 63
Bouquet de Flore (a) 22, 23
burmanicum 73
calostrotum subsp. riparium 56
subsp. keleticum 49
caloxanthum see *campylocarpum*
campanulatum 68
Distinction 64-5
campylocarpum 66, 67, 70
subsp. caloxanthum 49
campylogynum 56
Capt. Jack 78
caucasicum 54, 57
Pictum 52, 57
× *arboreum album* 54
celebicum (v) 61
see also *selebicum*
cephalanthum 49
chamaeunum 50
charitopes subsp. *tsangpoense* 49
Charlemagne (a) 22
Chikor 74, 75
christianae (v) 71
chrysodoron 49
chunii (a) 17
ciliatum 13, 56
ciliicalyx 72
cinnabarinum 49
subsp. *xanthocodon* 78
cinnamomium 68
citrinifolorum 50
Coccineum Major (a) 22
Speciosum (a) 22, 24
Colehurst 74
collettianum 56
Col. Rogers 70
complexum 56
coriaceum 73

Rhododendron (cont.)
Countess of Haddington 75
crenulatum 14
cuneatum 56
Cunningham's White 52, 53, 54, 57
× *fortunei* 53
Cunningham's Blush 54
Cunningham's Sulphur 54
Cuprea Aurantia (a) 22
Damaris 75
dasypetalum 56
davidsonianum 56, 68, 73
Daviesii (a) 22
Decus Hortorum (a) 22
Delicata (a) 22
decorum 57
delavayi 68
aff. 15
see also *arboreum* 45
densifolium (v) 17
diaprepes 57
dichroanthum subsp. *scyphocalyx* 49
didymum see *sanguineum*
Director Ch.Baumann (a) 22
Dopey 52, 54
Domenico Seassi (a) 24
Dora Amateis 75
edgeworthii 13, 46, 49, 69
elegantulum 66
Elsae 74
emarginatum (v) 17
Emile (a) 22
Enziana 53
euchaites 73
exasperatum 69
excellens AC165 24
aff. 13, 14, 15
eximium 68
eymae (v) 62
falconeri 66, 67, 68
Fanny (a) 22, 24
fargesii see *oreodoxa*
fastigiatum 56
ferrugineum 53
fictolacteum 48, 68, 73
see also *rex*
fleuryi aff. 14
floccigerum 49, 71
forrestii 50,
fortunei 57
Fragrantissimum 75

Rhododendron (cont.)
fulvum 49
Galactic 74, 75
Gaul 74
Gen. Trauf (a) 22
genestierianum 47, 49, 69
Geraldii 72
glischrum 48
glischroides 69
Gloria Mundi (a) 22, 24
Glory of Penjerrick 71
grande 13, 66
Grandeur Triumphante (a) 22
haematodes 57
Halfdan Lem 74
hanceanum 56
Hazel 75
hemitrichotum 56
Hinodigiri (a) 75
hirsutum 53, 56
hodgsonii × *eximium* 72
hookeri 71
Hoppy 52, 54
Hullabaloo 71, 75
hunnewellianum 70
hyperythrum 73
Idealist 74
Kiev 74
Ignea Nova (a) 22
impeditum 53, 56
impositum (v) 63
insigne 57
intricatum 56
irroratum 71
Janet 71
Josephine Klinger (a) 22
jucundum see *selense*
kawakamii (v) 17
keleticum see *calostrotum*
King George 74
see also Loderi King George
kyawii 47, 48, 56
Lady Montague 75
laetum × *zoelleri* (v) 72
lapponicum 56
lanigerum (v) 61, 62, 63
Lamellen 74
La Surprise (a) 22
Lavendule 74
Lem's Tangerine 77
lepidotum 56
leptobrachion (v) 61, 62, 63
leptocarpum 48, 49
leptocladum 14

Rhododendron (cont.)
leptothrium 47
lithocarpum 16
Little Jessica 71
Loderi Game Chick 74
King George 74
lomophobense (v) 63
logistylum 56
Louise (a) 69
Luscombei Splendens 74, 75
lutescens 56, 71
Bagshot Sands 52, 57
luteum (a) 51, 57
lyi 14, 56
macabeanum KW7724 71
× *falconeri* 66
× *lacteum* 67
× *sinogrande* 72
macrophyton 17
maddenii 13, 14, 15, 56
magnificum 49
makinoi 57
malayanum (v) 60, 62, 63
mallotum 20, 69
martinianum 57
Matador 75
michranthum 53, 56
Mme Gustave Guillomont (a) 22
Media grex 72
megacalyx 48
megaratum 50
mekongense 49
monanthum 47, 49
montroseanum 67, 71
Moonstone Pink 75
moulmainense 15, 49
monophyton var. *monophyton* (v) 62, 63
Naomi Glow 74
Hope 74
Narcissiflora (a) 22, 24
nemerosum 14
neriiflorum 66, 70
subsp. *phaedropium* 49
Nimrod 78
niveum 67, 68, 73
× *eximium* 72
Rhododendron (cont.)
nivale 56
Nivalis Striata (a) 22
nuttallii 13, 14, 48, 49
oblongifolium 15
occidentale (a) 51
oleifolium 57
oreodoxa 57
var. *fargesii* 57
oreonastes see *roxieanum*
oreotrephes 56, 68
orthocladum 56
Oscar (a) 22
ovatum (a) 17
Pallas (a) 22
pachysanthum 66
Peco (a) 75
phaedropum 49
see *also neriiflorum*
phaeochrysum 57
piercei 7
pingianum 68
Pink Delight 71
poilanii (v) 17
polycladum 56
polylepis 56
poremense (v) 61
praestatis hyb. 68
praetervisum (v) 72
Prelude 71
primuliflorum 51, 56
Prince Henri de Pays Bas (a) 22
Princess Anne 53, 75
principis 57
prinophylum (a) 57
protistum 46, 49, 68
przewalski 57
pseudociliipes 47
pseudobuxifolium (v) 61, 63
psilanthum (v) 61
puderosum 68
pudorinum (v) 61
Purple Pillow 74
quadrasianum var. *selebicum* (v) 60
Queen of Hearts 74, 75
quinquefolium (a) 73
racemosum 56
radians (v) 61
Rainbow 24
Raphael de Smet (a) 22
Rhododendron (cont.)
repens 21
rex 73
subsp. *fictolacteum* 48
rhodopus (v) 60, 63
Rosamunde 71
rothschildii 48, 68
Rouge Brique (a) 22
rouseii (v) 72
roxieanum var. *oreonastes* 47, 73
rubineiflorum × *inconspicuum* (v) 72
rubiginosum 48, 49, 57, 73
Ruby Hart 74
rude 69
rupicola 50, 57
rushforthii (v) 17
russatum 57
St Breward 75
Sally (a) 22
saluenense 50, 57
Sang de Gentbrugge (a) 22
sanguineum 49
subsp. *didymum* 57
Sarlad 74
saxicolum (a) 17
saxifragoides (v) 72
schlippenbachii (a) 67
scyphocalyx 49
searlianum (v) 72
seinghkuense 49
selebicum see *quadrasianum* (v)
selense var. jucundum 68
semnoides 68
sidertum 47, 66, 68
sinofalconeri 13
sinogrande 13, 47, 48, 49, 66, 68
× *falconeri* 67
sinonuttallii 14
Sir Robert Peel 57
smirnowii 57
sororium (v) 14
sperabile subsp. *sperabile* 49
spinuliferum 71
stenaulum see *moulmainense*
stewartianum 49, 50
Rhododendron (cont.)
Sulfureum 15, 49, 68, see also Cunningham's Sulphur
Susan 64
taggianum 49
taliense 57
telmateium 57
temenium 50
tephropeplum 15, 57
thayerianum 68
thomsonii 67, 70, 73, 74
traillianum 57, 68
trichocladum 57
triflorum 50, 68
tsangpoense see *charitopes*
tsariiense 66
Unique (a) 22
uvarifolium 57
vaccinioides 49
valentinianum 15, 57
veitchianum 72
aff. 14
vernicosum 57
Versicolor (a) 22
versiculum 49
virgatum subsp. oleifolium 57
viscidifolia 66
Vulcan (a) 22
wadanum (a) 73
wardii 57
W.F.H. 71, 75
White Olympic Lady 74
wightii 70, 73
williamsianum 57
xanthocodon 78
xanthostephanum 15, 48, 69
yakushimanum 54
hybrids 52
× Lady Eleanor Cathcart 75
yungningense 57
yunnanense 57, 68
Yvonne 75
zaleucum 47
zeylanicum 69
Taiwania flousiana 48

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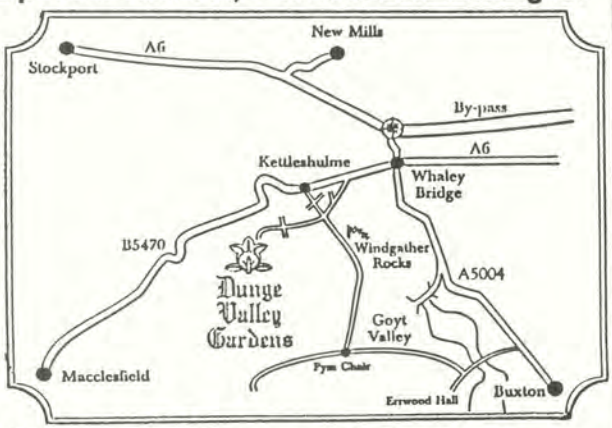

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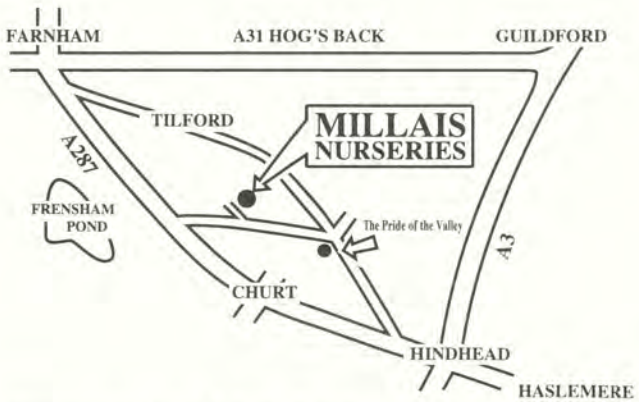

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