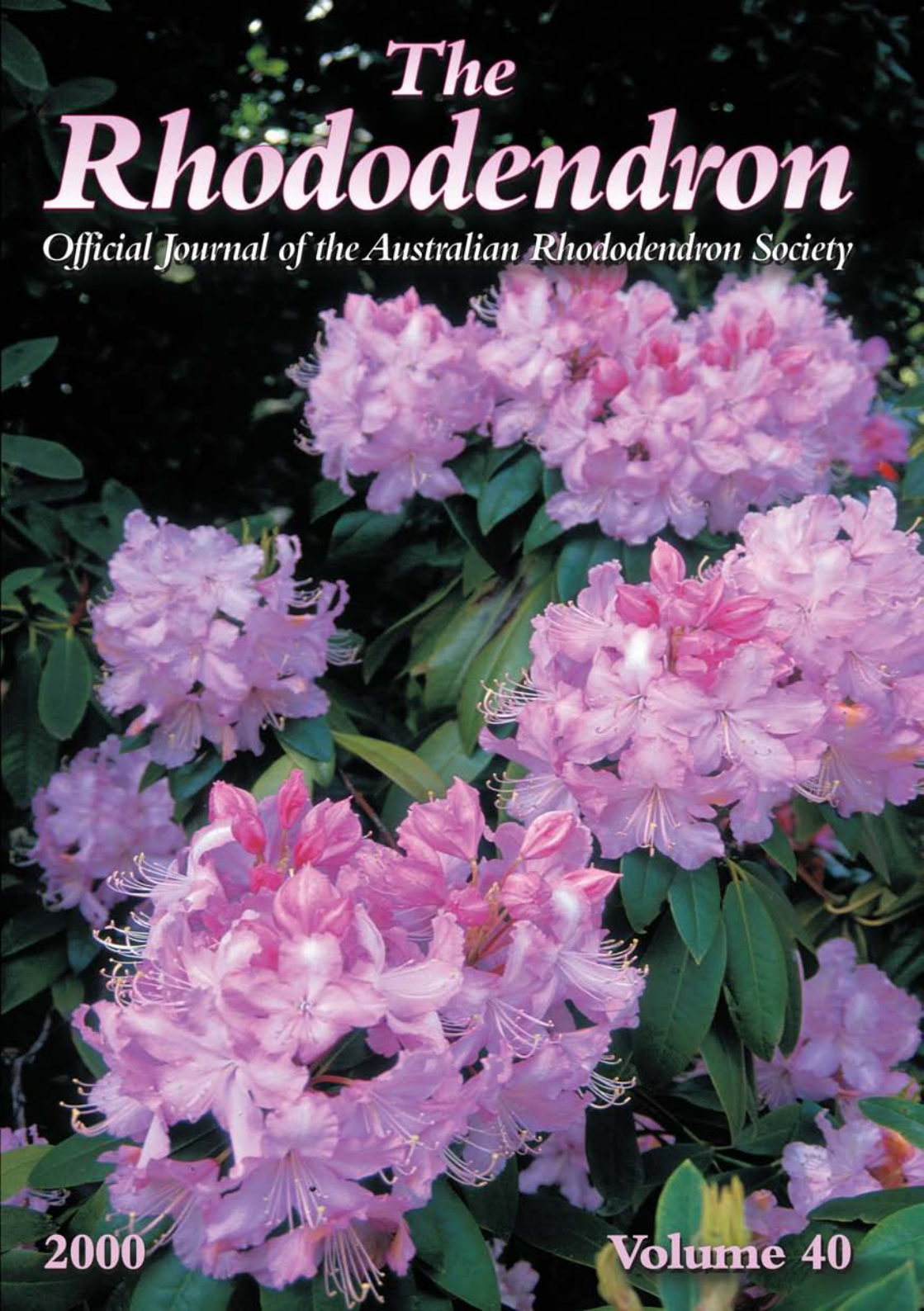
The Rhododendron

Official Journal of the Australian Rhododendron Society



2000

Volume 40

The Australian Rhododendron Society Inc.

Aims

The Society's objective is to encourage interest in and disseminate information and knowledge about the genus *Rhododendron* and to provide a medium with which all persons interested in the genus may communicate and co-operate with others of similar interest.

Membership

Membership of the Society is open to all persons interested in the objectives of the Society upon payment of the annual membership subscription. For further information contact the Branches' or National Council's Secretaries.

Subscriptions

Australian members pay an annual subscription to the Society's National Council of $15 per annum. The annual journal *The Rhododendron* is included as a benefit of membership. Individual branches collect membership subscriptions from their own members, which may include amounts additional to the National Council subscription.

Subscription for overseas members is A$25 per annum, which includes affiliation with a nominated Australian branch, and airmail delivery of *The Rhododendron*. Overseas subscriptions may be paid by bank draft, and in certain branches by Visa or Mastercard.

Our front cover

Durable turn-of-the-century hybrid from the Waterer dynasty, 'Mrs E.C. Stirling', photographed by Richard Francis in the Royal Tasmanian Botanic Gardens, Hobart.

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Contents

The Rhododendron, the journal of the Australian Rhododendron Society Inc., is published annually by the Australian Rhododendron Society. Material for publication in The Rhododendron is welcomed and contributors are requested to note that the closing date for each issue is August 1.

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The President's Report

The past year has passed all too quickly and left in its wake an opportunity to reflect once again on the continuing evolution of our Society. The highlight of the year has been the preparation by our Victorian Branch to present the Rhododendrons Down Under – Australia 2000 Conference in October. This will see the culmination of several years' work by a small, dedicated team.

Once again such a conference presents an opportunity to welcome the world, along with our own members, in a celebration of rhododendrons, this time as we pass into the new millenium.

Some interesting questions will be posed in discussions during this event. Such discussion is both timely and necessary, and I hope that it will draw many participants. I don't have all the answers to where we need to be heading in the future. I do know that we cannot dwell in the past, as pleasant as that may sometimes appear. Change is as inevitable as death and taxes. We can embrace it with enthusiasm, and look forward to some exciting times, or we can resist and be doomed to misery and irrelevance.

Given the changing times, I would be most remiss if I failed to mention a very significant development in Australian rhododendron history.

We are currently witnessing a lifetime's work from one of Australia's great modern hybridisers being brought to fruition by his foresight in ensuring that his creations are made available to the general public through a progressive commercial release. Congratulations are due to Brian Clancy and his daughter Geraldine Roelink who have delivered a great legacy to an appreciative public. All too often such work is lost with the passing of a dedicated producer. Through registration and commercial release, these most worthy additions to Australia's rich rhododendron tapestry will be preserved for future generations.

To many, this may seem to be just another commercial enterprise. In these modern times, when so much revolves around money, and little time is available for anything else, I believe it is absolutely crucial that our commercial sector is encouraged to function to full capacity. Essentially, if there are commercial opportunities out there, they will always be exploited, and in such cases, rhododendrons will be actively promoted to the public. Such activity is of enormous help to our cause.

Our AGM at the October conference will see me pass the baton to another. In so doing I must apologise for my inability to contribute more adequately during this time, to the work of the Society which has honoured me in this

way. A change of career path shortly after being elected to office has severely curtailed my available time. This situation has placed an unreasonable workload on the Secretary at a time of extreme activity. My sincere thanks must go to Barry for his efforts.

I look forward to meeting many of you again in Melbourne in October, and to the opportunity to contemplate our collective future. Let us spare no effort to ensure that rhododendrons are appreciated, understood, and widely cultivated in the new millenium. Thank you for your support and encouragement.

Neil Jordan

Editor's note re Rod Capon's article on lace bugs, page 21

After this issue of *The Rhododendron* was printed, it came to light that we had used a draft, rather than the final version of Rod's article. The correct version of the article is now in place.

Rod also supplied two illustrations to support his story after we had gone to press. In order to retain correct pagination, I have added these illustrations on a single page at the end of the issue.

Richard Francis
March 2013

THE AUSTRALIAN RHODODENDRON SOCIETY
NATIONAL COUNCIL

Annual Report for the Year 1999–2000

Barry Stagoll

The 1999 Annual General Meeting of the Australian Rhododendron Society was held on 6th November in Burnie, Tasmania, in conjunction with the Annual ARS "National Weekend" convention, very capably hosted by the Emu Valley Rhododendron Society (a separate story appears elsewhere in this issue). The Society's Committee (National Council) met also during the event.

President Mr. Neil Jordan chaired both meetings. His President's Report delivered to the AGM was published in the 1999 Journal.

The AGM was advised that the National Council at its meeting had re-elected Neil Jordan as President and Allan Kerr Grant as Vice President, with the remaining officers on National Council also being confirmed in their existing roles.

The full membership of National Council, to serve from the close of the AGM, as reported to the AGM comprised the following:

Officers

President	Neil Jordan
Vice President	Allan Kerr Grant
Secretary	Barry Stagoll
Treasurer	Neil Webster
Librarian	Val Marshall
Technical Officer	Ken Gillanders
Registrar	Graeme Eaton
Immediate Past President	John Schutz (also Public Officer)

Branch Delegates to National Council

Southern Tasmania	Barry Davidson
	Shane Atkins
Emu Valley R.S.	Maurie Kupsch
	Terry Shadbolt
South Australia	Lester Duthy
	Allan Kerr Grant

Illawarra	Hazel Holmwood
	Michael Lopez
Victoria	Lionel Marshall
	John Quinn

The Society's Financial Statements for the year ended 30th June 1999 were received and adopted (as published in Volume 39, 1999 *The Rhododendron*).

National Council held a further meeting during the year (in April 2000) by teleconference. At this Meeting, Sue Wells replaced Shane Atkins as a Delegate for Southern Tasmania and Irene Jordan again represented EVRS as an alternate, this time for Maurie Kupsch. Amongst other matters, National Council discussed progress in establishment of Branch websites to link to the national website; considered the advantage of registering an Australian Business Number for the Society; renewed the appointment of Richard Francis as Editor of the Journal and established an Editorial Committee to foster, assemble and review material for publication in the Journal; and decided on a more economic fee structure for applicants desiring to register hybrids.

Paid membership numbers fell to 408 (from 440 in 1999) prior to including the effect of the curtailment of affiliation with the Australian Rhododendron Society in October 1999 by the former Illawarra Branch (since renamed the Illawarra Rhododendron Park Inc.) and the consequent removal of a further 26 members of this body from the total national membership. The decision of the Illawarra body was dictated by the interest of a majority of members being concentrated on the Rhododendron Park. Moves are afoot by rhododendron enthusiasts in Wollongong to incorporate a new body to take up the vacated Branch affiliation. In the meantime, contact with these enthusiasts, and a flow of information about the activities of the Society, continues. The appointments of Illawarra Delegates to National Council were revoked with the curtailment of the affiliation of the Illawarra Branch.

There has been a pleasing increase in the number of overseas members over the last two years, and we welcome their interest.

The financial outcome for the year showed an improvement on that for the previous year, despite a reduction in members' levies received due to the slightly lower current membership total. A major contributor to the improvement was a reduction in expenditure on publication of the Journal, which was achieved without any dimunition in its quality. The national accounts for the year, which appear elsewhere in this issue, disclose a surplus (increase in net assets) of $1,267 (1999 $1,398).

National Council will hold its next meeting in Melbourne,Victoria during the "Rhododendrons Down Under" Conference, organised by the Society's Victorian Branch and scheduled to be held in mid-October.

The Annual General Meeting of the Society for 2000 will be held during dinner on the Saturday evening during the conference (members have received formal notice of meeting, and their personal invitation to the weekend event, via their Branch newsletters). The AGM proceedings will include formal recognition of two new Life Members created during the year, Mrs Ruth Funder and Mr. Alan Walker, both of Victoria. A separate article provides background on their election. ❀

Life Members

At the April 2000 meeting of National Council, Victorian Branch proposed for Life Membership of the Society Mrs Ruth Funder and Mr Alan Walker. National Council was pleased to accept the proposals and both were elected as Life Members.

The citations presented by Victorian Branch in support of the proposals read as follows:

Ruth Funder was a founding member of the Australian Rhododendron Society when she became associated with a group of people who wished to form the Australian Rhododendron Society in 1960.

In 1935, Ruth graduated from Adelaide University in Science, majoring in Botany (BSc.). After graduation, Ruth spent the next five years at the Waite Agricultural Institute working on the "Physiological Ontogeny of the Tobacco plant". From this work, Ruth was awarded the Master of Science (MSc.).

In early 1940, Ruth was married to John. Later, they came to Melbourne with their first three children. At the time, John was working on the new medication Penicillin.

In addition to the responsibilities of a growing family, Ruth had interests in painting, dressmaking, upholstery and pottery. Much to her delight, Ruth met a group of people who were to become the founders of the Australian Rhododendron Society at Olinda Victoria.

From those early days, vireya rhododendrons became Ruth's first botanical love. In addition to raising and showing many fine vireyas, Ruth travelled with several overseas gardening tour groups to PNG and Borneo to see vireyas in the wild.

Ruth has always brought the Society to the attention of the gardening public and is most generous in helping new and old members in pursuit of knowledge of the genus.

In the wider scene, Ruth has been instrumental in further diffusing the knowledge of vireyas by joining the Growing Friends of the Royal Botanical Gardens, Melbourne. She was behind the decision of the Gardens to establish a vireya bed in recent years.

Ruth has been awarded many ribbons and prizes at the Society's shows, and she continues to present exhibits of a high standard at shows and monthly meetings. Her active involvement with the Society is acknowledged and greatly appreciated, e.g. her continued participation in the volunteer group who meet every week at Olinda to raise many thousands of plants.

Ruth has represented the Society on the Committee of Management of the Rhododendron Gardens Olinda.

I have much pleasure in supporting the appointment of Ruth Funder to the position of Life Member of the Australian Rhododendron Society.

Proposed by Neil G. Webster, Victorian Branch and National Treasurer.

Alan Walker, as a child, resided in East Melbourne in a house adjacent to a vacant block of land which his father utilised for an extended garden. The rear garden consisted of vegetables but a prolific display of flowers on the street frontage was admired by all who passed by. Alan naturally became involved in this gardening project.

Alan's working life commenced in the retail field with the firm of G.J. Coles Pty Ltd, where he occupied a managerial position for some years, and became an Area Supervisor of the Victorian and Tasmanian Produce Area. He was responsible for many innovations in that large retail organisation until he was forced to retire with ill-health in 1982.

In 1958 he married and moved to Warrandyte but still found time to commence making a garden in his new home. He admired the garden of his neighbour who had two rhododendrons which attracted his eye. From that time he started cultivation of these plants and in so doing, he later found himself for a few years at the Melbourne Cup Weekend annual Rhododendron Show at Olinda.

During the latter part of the 1970s he joined the Society and attended the General Meetings which were held in the Camberwell Civic Centre and attended Technical meetings and assisted in the construction and maintenance of the Olinda Garden.

On his retirement he found that gardening was beneficial to his health and spent about three days a week at Olinda as a volunteer, as well as working on his property at Warrandyte – in between his duties as a volunteer fire fighter with the CFA.

Since 1950, Alan has maintained a close association with the Salvation Army, carrying out many varied duties with the Emergency Services, alongside his wife, Gwen.

Alan has held positions on the Branch committee and Show subcommittee. He is Assistant Librarian of the Branch, and is a regular Volunteer on the weekly garden propagation and maintenance group in the Olinda Garden. He has given freely of his time in all aspects of Society shows and meetings,

including propagation and cultivation techniques, and has published articles in *The Rhododendron* and in the Branch newsletter.

Alan takes every opportunity to promote the Victorian Branch and the Australian Rhododendron Society to all members of the public with whom he makes contact.

Proposed by Jack Morris, Victorian Branch Committee Member.

Rhododendrons and Stamps

Dr R.M. Withers

For those gardening enthusiasts who grow plants of the *Rhododendron* genus, a further interest may be found in the collection of postage stamps depicting rhododendron flowers. Many countries have issued very attractive stamps illustrating rhododendrons. In this article I will describe a few of these stamps which I have been fortunate enough to obtain from stamp dealers in Australia and overseas. My collection includes single stamps, blocks of stamps, minisheets, and first day covers.

One of the most attractive sets is one of four vireya species from Papua New Guinea, issued on 25 January 1989. They were designed by our former member and avid vireya collector the late Canon Norman E.G. Cruttwell and feature *R. cruttwellii*, *R. zoelleri*, *R. superbum* and *R. christianae*, the last being named very appropriately in honour of his mother, Christian. I have blocks of six stamps as well as single stamps, first day covers carrying sets of all four stamps, and also the stamp packs produced especially for collectors and containing background about the stamps and their subjects.

Another PNG stamp, one of four in the first PNG Christmas issue in 1989, features a vireya. The 35t denomination depicts a mask from the Murik Lakes near the mouth of the Sepik River, Mary and the baby Jesus, and the delicate bloom of *R. zoelleri*.

Turning now to Asia, Malaysia issued a stamp featuring a vireya rhododendron, *R. scortechinii*, which has flowers of yellow, white, or with yellow

lobes and orange tubes. It grows on the Malay Peninsula, but is probably not in cultivation.

The Ministry of Posts and Telecommunications of China issued a set of eight special stamps featuring rhododendrons of China on 25 June 1991. In accompanying background provided at the time of issue, it was noted that rhododendrons originated in the Tertiary period, tens of millions of years ago. It went on to state that China had more than 600 of the 900 named species worldwide, some species producing a fragrant essence, some being edible, and some being used in medicine. The eight stamps carried the names used at the time for the plants depicted: *R. delavayi* (syn. *R. arboreum* ssp. *delavayi*), *R. molle* (syn. *R. molle* ssp. *japonicum*), *R. simsii* (syn. *R. scabrum* ssp. *scabrum*), *R. fictolacteum* (syn. *R. rex* ssp. *fictolacteum*), *R. agglutinatum*, *R. fortunei*, *R. giganteum* (syn. *R. protistum* var. *giganteum*), and *R. rex*. In addition China Post issued some very attractive sets of the stamps on first day covers, and a minisheet of *R. wardii*.

Bhutan has issued a number of sets of stamps including rhododendrons. Unfortunately, none of these sets are dated. One set of ten stamps included *R. mucronatum* (now presumed a hybrid of *R. ripense* and *R. stenopetalum*) and *R. campanulatum*, together with stamps showing other flowers. Another set of five stamps all carry rhododendrons: *R. arboreum*, *R. campanulatum*, *R. cinnabarinum*, *R. fortunei*, and *R. arboreum* in a paler colour than the first in the set. There's also a beautiful stamp featuring *R. dalhousiae* var. *rhabdotum*, and a set featuring *R. haematodes* ssp. *chaetomallum* and *R. giganteum*.

In 1975 North Korea issued a set of six very attractive stamps, featuring azaleas. Unfortunately, the writing on the stamps in all in Korean, so it is difficult to identify which ones they represent. Later, in 1989, another very nice stamp was issued featuring *R. obtusum* (syn. *R. kaempferi* var. *tubiflorum*).

I have two stamps from Japan, one featuring *R. aureum*, and the other an unknown azalea.

In 1995 Vietnam issued a set of six stamps, featuring *R. fleuryi*, *R. sulfureum*, *R. ovatum*, *R. lyi*, *R. tanastylum*, and *R. sinofalconeri*.

A very interesting stamp from Mongolia is triangular in shape and depicts *R. dauricum*. And in 1992 Thailand released a fine stamp featuring *R. simsii*.

Changing continents, the Republica de Guinea Equitorial issued a very nice set of four stamps featuring *R. catawbiense*, *R. smirnowii*, *R. yedoense* and *R. schlippenbachii*. Again I have no information on their date of issue.

As for European examples of rhododendron stamps, in 1975 Germany issued a very nice stamp depicting the alpenrose (presumably *R. ferrugineum*, although the common name alpenrose appears to be used for both *R. ferrugineum* and *R. hirsutum*).

Italy issued a nice stamp in 1983 which was labelled "*Rhododendron cornisha*". Maybe a reader could identify this.

Romania has issued two stamps featuring rhododendrons, *R. hirsutum* and (in 1974) *R. kotschyi* (syn. *R. myrtifolium*, closely allied to *ferrugineum*).

And the former Yugoslavia issued a fine stamp showing *R. ferrugineum* with a backdrop of high mountains.

Lastly, there are two stamps from Belgium. The first, issued in 1975, shows a plant of *Azalea japonica* in flower, and the second, issued in 1979, shows a very attractive spray of *R. simsii*.

I am sure many more examples of rhododendrons, including azaleas, may be found on postage stamps from various countries, and it would be a great interest for anyone to start a wider search for them. ❀

About the author

Dr Robert Withers O.A.M., or "Dr Bob" as he's known in gardening circles, is a foundation member of ARS, and a member of the Ferny Creek Horticultural Society since before ARS was founded by members of that Society.

He graduated as Bachelor of Medicine and Bachelor of Surgery from the University of Melbourne in 1946, semi-retiring in 1987 from a long career in medical practice.

Dr. Bob was interested in horticulture from an early age, and from 1950 has been seriously involved, particularly with lilliums, rhododendrons and camellias. He lectured and been published many times on subjects related to these genera.

He was a foundation member of the Australian Lillium Society, and has been a member of the Australian Camellia Research Society since 1972, and is also a member of the RHS UK Rhododendron, Camellia & Magnolia Group, RHS Victoria, Waverley Garden Club, and Rose Society of Victoria. Amongst his many achievements in the horticultural field, he was awarded the Gold John Pascoe Fawkner medal by the Fellows Group of the RHS Victoria in 1990, the Gold Veitch Memorial Medal by the RHS UK in 1992, the medal of the Australian Rhododendron Society, the Merrillees Memorial Camellia Gold Medal, the E.G. Waterhouse Medal, and in 1997 a fellowship of the Australian Camellia Research Society.

He was further honoured with the Medal of the Order of Australia in the 1995 Australia Day honours, for his dedication to horticulture over more than 50 years.

The Gillanders Shield

The Southern Tasmanian Branch of the ARS is pleased to honoured Ken and Leslie Gillanders. From the year 2000 the shield given for the grand champion bloom at its annual rhododendron show held each October will be known as the Gillanders Shield.

The naming of this shield recognises the huge contribution they have both made to the Southern Tasmanian Branch.

It was Ken and Leslie's confidence and determination that ensured the first show took place and was a resounding success.

Eleven years later they are still working hard for the society and at the show. There can be no one more deserving of this award.

Thankyou and congratulations from all the members. ❀

New Registrations 1999–2000

Graeme Eaton

The following is a listing of registrations submitted by the Australian Rhododendron Society Plant registrar, and approved by the Royal Horticultural Society during the year 1999–2000.

Colour numbers refer to the RHS Colour Chart. Accompanying colour names are taken from *A Contribution Towards Standardization of Color Names in Horticulture*, R.D. Huse and K.L. Kelly, edited D.H. Voss (ARS 1984).

Parents of plants are reported in the conventional order–seed parent × pollen parent.

Abbreviations used:

H	hybridized by
G	Grown to first flower
S	selected by
N	named by
I	introduced by
Reg.	registered by

'Aileen O'Rourke' Elepidote hybrid of 'Letty Edwards' × 'Odee Wright'. H. (1983), G. (1990), N. (1999) & Reg. (1999) Hilary O'Rourke. Dome-shaped truss of 9–10 funnel-shaped flowers, 55 x 88 mm, with 6 wavy edged lobes. Colour: Buds Moderate red (47A) open inside to Light yellowish pink (38C) at lobe edges and Light orange yellow (24C) in the centre of each lobe, and outside to Strong yellowish pink (37A) at lobe edges and Light orange yellow (24C) near calyx and in the centre of each lobe, Slight, Vivid red (46B) markings deep in the throat at the base of the 3 dorsal lobes. Leaves: Elliptic, 85–90 × 26–30 mm, smooth edged, semi-glossy, obtuse at base and truncate at apex, no indumentum. Size: 1.2 m × 1.5 m in 16 years. Flowers October/November in Tasmania.

'Beauty of Lockington' Elepidote hybrid of 'Cup Day' × 'Naomi'. H. (1987), G. (1994), N. (1999) & Reg. (1999) Don Dosser. Lax flat truss of 9 slightly scented, funnel-shaped flowers, 76 × 100 mm, with 6 wavy edged lobes. Colour: Buds Strong yellowish pink (37B) open inside and outside to Light greenish yellow (8C) in throat shading to Strong pink (50C) at lobe edges,

Strong red (47B) spots on 3 dorsal lobes. Leaves: Elliptic, 220 × 62 mm, decurved, matt, obtuse at base and apex, no indumentum. Size: 1.5 m × 1.5 m in 12 years. Flowers October/ November in Tasmania.

'Bonnie Girl' Elepidote hybrid of 'Annie Dosser' × 'Red Gate'. H. (1989), G. (1997), N. (1999) & Reg. (1999) Don Dosser. Ball-shaped truss of 17–21 broadly campanulate flowers, 50 × 40 mm, with 6 frilly edged lobes. Colour: Buds Vivid purplish red (57C) opening inside to Pale purplish pink (62D), outside the same colour with Deep purplish pink (70) veins, Light yellow (10B) spots on 3 dorsal lobes. Leaves: Elliptic, 125 × 40 mm, wavy edged, matt, obtuse at base, acute at apex, no indumentum. Size: 1.2 m × 1.2 m in 10 years. Flowers July in Tasmania.

'Coronation Pride' Elepidote hybrid of 'Lockington Pride' × 'Coronation Day'. H. (1990), G. (1998), N. (1999) & Reg. (1999) Don Dosser. Ball-shaped truss of 11–20 funnel-shaped flowers, 76 × 100 mm, with 5 wavy edged lobes. Colour: Strong purplish pink (63C) inside and the same outside with Moderate purplish pink streaks on lobe midribs. Moderate purplish red (64A) spots on 3 dorsal lobes with a blotch of the same colour in the throat. Leaves: Elliptic, 220 × 60 mm, smooth edged, semi-glossy, obtuse at base and apex, no indumentum. Size: 0.6 m × 1.0 m in 9 years.

'Donella' Elepidote hybrid of 'Morio' × 'Mrs E. C. Stirling'. H. (1970), G. (1978), N. (1999) & Reg. (1999) Don Dosser. Ball-shaped truss of 10 campanulate flowers, 50 × 80 mm, with 6 frilly edged lobes. Colour: Buds Deep purplish pink (73A) opening inside to Strong purplish pink (73B) at lobe edges shading to Very pale purple (69C) in centre of each lobe, outside Strong purplish pink (73B), Deep purplish pink (73A) spotting at base of 3 dorsal lobes. Leaves: Broadly elliptic, 98 × 40 mm, smooth edged but twisted, semi-glossy, obtuse at base and apex, no indumentum. Size: 1.0 m × 1.0 m in 29 years. Flowers October/ November in Tasmania.

'Donvale Cherry' Elepidote hybrid of 'Glen Glow' × *arboreum* . H. (1992), G. (1998), N. (1999) & Reg. (1999) Jack O'Shannassy. Dome-shaped truss of 19 tubular campanulate flowers, 60 × 60 mm, with 5 wavy edged lobes, the large stamens are a feature. Colour: Buds Moderate red (47A) opening inside and out to the same colour. Nectaries Dark red (187A). Calyx: Uneven 10–30 mm, Moderate red (47A). Leaves: Elliptic, 150–210 × 35–50 mm, wavy edged and slightly decurved, matt, cuneate at base, acuminate at apex. Size: 1.1 m × 1.1 m in 7 years. Flowers October in Victoria.

'Donvale Tiffany' Elepidote hybrid of 'Tortoiseshell' grex × 'Donvale Lady'. H. (1990), G. (1995), N. (1999) & Reg. (1999) Jack O'Shannassy. Ball-shaped truss of 11 funnel-shaped flowers, 65 × 100 mm, with 6 wavy edged lobes. Colour: Buds Strong red (53B) opening inside to Strong purplish pink (68B) at lobe edges shading to white, fading to white with age, and outside to Deep purplish pink (68A) at lobe edges, shading through Strong purplish pink (68B) to white near base, fading to white with a Very pale purple (69A) blush with age. Strong purpliush pink (68B) light spotting on dorsal lobe. Moderate yellow (162A) blotch in throat on dorsal lobe. Spots and blotch stay with age. Calyx: Uneven to 2 mm, Light yellow green (145B). Leaves: Elliptic, 115–185 × 31–50 mm, decurved, matt, obtuse at base, apiculate at apex, no indumentum. Size: 1.5 m × 1.6 m Flowers September / October in Victoria.

'Fiery Woman' Elepidote hybrid of 'Ruby Hart' × 'Delamere Belle'. H. (1989) the late Frank Waghorn, G. (1996), N. (1999) & Reg. (1999) Don Dosser. Lax truss of 5–7 campanulate flowers which have a waxy substance, 40 × 50 mm, with 5 wavy edged lobes. Colour: Buds Dark red (59A) opening inside and out to Strong purplish red (60B), no blotches or spots. Leaves: Broadly elliptic, 70–77 × 27–30 mm, decurved, semi-glossy, obtuse at base, apiculate at apex, no indumentum. Size: 0.75 m × 0.75 m in 10 years. Flowers September/ October in Tasmania.

'Frosty Elegance' Evergreen azalea hybrid which is a seedling of 'Apricot Blush'. H. (1992), G. (1995), N. (1999) & Reg. (1999) Don Dosser. Open truss of 2–3 widely funnel-shaped flowers. 50 × 75 mm, hose-in-hose, wavy lobes. Colour: Buds Strong yellow green (145A) opening inside and out to pure white with no spotting or blotches. Leaves: Obovate, 45–55 × 20–22 mm, decurved, semi-glossy, hairs on the edges and undersides of leaves. Size: 0.9 m × 0.6 m in 7 years. Flowers October in Tasmania.

'Gillian Bramley' Lepidote hybrid of unknown parentage. Probably has some *maddenii* in it. Probably a hybrid made by the late Alf Bramley. Has been around the nurseries for many years. Lax truss of 4–9 tubular funnel shaped flowers, 75 × 60 mm, with 5 wavy-edged lobes. Colour: Buds Deep purplish pink (59B) open inside to Brilliant yellow (12B) in throat shading to Pale yellowish pink (27C) with Deep purplish red (59B) blushes at lobe edges, fading to Pale yellowish pink (27D) with only the faintest blush remaining, outside Pale yellowish pink (27C) with Deep purplish red (59B) conspicuous spotting at lobe eges, fading with age to remain only on dorsal lobes. Calyx: 5–8 mm, Strong yellow green (143C). Leaves: Broadly elliptic, 95 × 40 mm,

decurved, glossy, attenuate at base, obtuse at apex. Size: 1.5 m × 0.9 m . Flowers October in Victoria.

'Mia' Elepidote hybrid of 'Tortoiseshell Wonder' × 'Loder's White'. H. (1990), G. (1998), N. (1999) & Reg. (1999) Don Dosser. Ball-shaped truss of 18 funnel-shaped flowers, 65 × 110 mm, with 6 wavy-edged lobes. Buds Light yellow (11B) open inside and out to the same colour fading with age to pure white. Moderate red (47A) spots on 3 dorsal lobes. Calyx: Uneven up to 5 mm, red. Leaves: Elliptic, 175 × 63 mm, decurved, glossy, obtuse at apex and base, no indumentum. Size: 1.0 m × 1.0 m in 9 years.

'Miss Erika Holmes' Elepidote hybrid of 'Marg Sawers' × Unknown. H. (1990), G. (1997), N. (1999) & Reg. (1999) Don Dosser. Conical truss of 12 broadly funnel-shaped flowers, 98 × 65 mm, with 7 frilly-edged lobes. Colour: Inside Light purple (75B) fading to white and outside the same but retaining Light purple (75B) streaks on lone midveins, Vivid purplish red (61C) spotting in throat on all lobes. Calyx: Uneven up to 4 mm. Leaves: Elliptic, 195 × 55 mm, smooth-edged, semi-glossy, obtuse at base, acute at apex, no indumentum. Size: 1.5 m × 1.2 m in 9 years. Flowers October/ November in Tasmania.

The Australian Rhododendron Society Plant Registrar should be contacted, in the first instance, by persons seeking to register. Mr Graeme Eaton, 1386 Mount Dandenong Tourist Road, Mount Dandenong, Victoria 3767. Telephone (03) 9751 1105 or e-mail eaton@hard.net.au

Rejuvenating older rhododendrons

Laurie Begg

Many rhododendron plants can become very woody, and their blooming appearance can be inhibited by the fact that they carry more numerous but smaller trusses than they did when more youthful. They can benefit from pruning and restorative maintenance. Similarly, plants which have been damaged by storm or fire need such attention. But how is it best to go about it?

If you need to perform only minor repairs, in order to reshape a rhododendron, then it's best to make your cuts just above the leaf rosettes, and new growth will emerge from the dormant eyes there.

On the other hand, major surgery requires more time and keen observation of the plant.

A careful inspection should reveal small bumps, which are growth buds under the bark, or swellings indicated by rings around the bark. You need to make your cuts just above these bumps or rings so the dormant buds will be stimulated into growth, and there will be a minimum of old tissue left above them to wither.

If you can't find any dormant buds or rings on bare branches, make your cuts wherever it seems best to reshape the plant. Then you can keep an eye on it and retrim as seems advisable above new growth when it emerges.

I have cut older rhododendrons, which needed rejuvenating, back to six inches above ground with good results.

Later, when new growth starts, I trim out any weaker growth and begin the reshaping process.

In my experience, certain species, and some hybrids, either do not respond well – or in cases, not at all – to such pruning. These include *R. grande*, *R. falconeri*, *R. thomsonii* and *R. morii*. Loderi 'Hawk' hybrids do not produce new growth from bare wood, so it is best to cut them back only a little at a time, to see what response, if any, they produce.

As to the best time to prune back, I recommend the Spring, immediately after flowering. Some sunburn may be experienced on the emerging new growth if pruning is left too close to the hotter Summer weather. ❀

Understanding the enemy
demystifying the lace bug

Rod Capon

See note, page 4

There can be little doubt the beautiful little lace bug is the most widespread and serious insect pest affecting rhododendron culture in the world today. In Australian gardens too, they can quickly devastate our cherished plants unless checked. In compiling this overview, largely the result of sheer curiosity on my part, I have gathered information from professional entomologists, the scientific literature, the Internet and from experienced gardeners. In attempting to understand lace bugs and to undertake efficient and effective control, I believe it is especially important to know something about their biology

Lace bug species affecting rhododendrons and azaleas

Of the species of lace bug which may attack azaleas and rhododendrons, the azalea type (*Stephanitis pyrioides*), originally from Japan, is by far the most widespread, adaptable and damaging. The rhododendron lace bug (*S. rhododendri*), a native Northern American species, is also troublesome in some areas though not particularly so in Australia as far as I can tell. The Andromeda lace bug (*S. takeyai*) has also been reported as attacking both azaleas and rhododendrons in the USA and Europe but not in Australia.

Mercifully, aside from these three types I can find no evidence of any other of the 2,000 lace bug species being attracted to rhododendrons or azaleas. Further, it appears quite likely, even probable, we will only ever encounter the azalea lace bug as a serious threat to rhododendrons and azaleas in Australia – as far as this insect family is concerned anyway. Apart from these three, other lace bug species hosted by common plants and trees such as hawthorn, sycamore, oak, elm, cotoneaster, crataegus, cherry, alder, etc. may thrive near our rhododendrons and azaleas but will not harm them.

Terminology

Being able to correctly identify and properly name any plant pest is crucial to sound management. "Spider" mite, thrip and other insect pests are often wrongly blamed for lace bug damage. Thrip damage can look similar at first glance. Unfortunately, many books on rhododendron culture are quite misleading and confusing regarding even the correct designation. Specious names may

be encountered such as lacewing, lacewinged fly, rhododendron fly or even just rhododendron bug. There is no justification for continuing to use such inappropriate and misleading names in my view.

A common misunderstanding is to confuse lace bugs with lacewings as though these were alternative names for the same insect. In fact these are the common names for two entirely different insect families. Certainly, both groups happen to have insects with lace-like wings. However, lace bugs are classified as True Bugs, a distinctive order of some 30,000 species embracing the lace bug family. Significantly, all lace bugs have the common feature of being equipped with mouthparts to suck fluid from plant leaves.

Lacewings, on the other hand, are essentially predators with no interest at all in eating or sucking plant leaves. Fortunately for us however, they do have a great interest in devouring many pest insects. For example, the common green lacewing and their larvae will attack lace bugs voraciously at all stages of the lace bug life cycle.

Biology

Lace bugs belong to the order Hemiptera, which means half-wing, indicating an incomplete metamorphosis. Their ability to fly is very limited. However they can be windblown over considerable distances – literally "for miles". Hence ridding one's own property of lace bug may well provide only a temporary reprieve depending on the up-wind situation. They may also be transported over long distances when infected plants or plant parts are moved.

However, it is the protection afforded by the female lace bug to her eggs which greatly enhances the survival chances of the species. She inserts them within a sac, upright, internally into the underside of the leaf, not on the surface. They are then covered by a hard varnish-like substance for good measure. Eggs can be found along or near the midvein and when covered, form a small cone-like elevation on the leaf under-surface. Chemical sprays have no impact at this stage. Given that a single leaf may house 100 or more eggs, the potential for a population explosion is obvious. Leaves, whether attached or fallen, which contain eggs are clearly a major source of re-infestation.

In Australia, where winters are generally relatively mild, adults will continue to lay eggs which will hatch as the weather warms. Small wonder that fresh leaf damage is sometimes evident quite early in the growing season. Close monitoring of plants is therefore required virtually all year round, but particularly during the warmer periods. Lace bugs prefer warm, sunny situations to heavily shaded ones and thus regular checks of susceptible plants in these areas through early spring may give an early indication of lace bug activity.

The lace bug cycle from egg hatching to adult may be as short as 30 days depending on temperature, with up to five cycles per annum being possible. But these cycles are rarely neatly sequential. On any particular plant, or even on a single leaf, eggs, nymphs and adults can all be present as co-existing colonies. There are five nymphal stages for the azalea lace bug but only four for the rhododendron type.

As mentioned earlier, lace bugs extract juices from the leaves by using their piercing and sucking mouth structure. Both nymphs and adults are involved in this process which involves the injection of fluids into the leaf followed by the sucking out of the partly digested cell sap. Leaves with a heavy infection will quickly lose their ability to function properly and can become chloritic to the extent that the whole upper surface turns white. *R. misfortunei* is not a pretty sight and 'Alba Magnifica' takes on new meaning!

The leaf underside, meanwhile, can resemble a blackened battlefield of excreta, shed nymph skins and eggs, together with live nymphs and adults eagerly seeking out any untouched areas to feed on. If too many leaves are involved, the whole plant becomes weakened and vulnerable to other stress factors such as from fungus, other insects and adverse weather. It may well die as a result. In any case, the poor appearance will persist until affected leaves drop off. Some may drop prematurely but others may take a number of seasons to do so.

Host plants

A few words on host plants are probably useful. Whilst the preferred host plant for a particular species is usually reflected in its common name, most lace bugs can and do use other host plants provided they are of a closely related species.

For example, in the case of the azalea lace bug, it is attracted to many types of rhododendron as well as almost all the azaleas. This is not too surprising given that azaleas are a form of rhododendron. It will also attack mountain laurel (*Kalmia latifolia*), being a related species.

A similar situation exists with the rhododendron lace bug, which will attack some azaleas and mountain laurel. Although the preference of the Andromeda lace bug is for *Pieris japonica* (andromeda), it can also attack both rhododendrons and azaleas.

Natural immunity

We may take some comfort that quite a few rhododendron species and cultivars exhibit a good, if not total immunity to lace bug attack. It would seem that either an immune response by the plant is at work, or the plant has some other

characteristic which renders it unattractive to the lace bug. The thick indumentum of some rhododendrons such as *R. degronianum* ssp. *yakushimanum* appears to protect the leaf vein structure from attack. However some 'yak' hybrids with some degree of indumentum have been observed with lace bug damage.

Lace bug survey

Using the illustrations provided, interested readers may care to arm themselves with a magnifying glass and sample the lace bug population in their area. I would be very interested to know if anything other than *S. pyrioides* is encountered. Granted, this is essentially of academic interest given that control measures for any lace bug would be essentially the same.

It would, however, be of rather more than just academic interest to know the names of those varieties or species of rhododendrons which appear to be lace bug resistant as well as those which seem very susceptible. I am currently compiling such lists from information given by members of the South Australian Branch and would be glad of any additional input.

The future

The natural resistance of certain plant species to insect attack is of major interest to horticultural science today. Inbuilt immunity may well be the most satisfactory approach to controlling lace bug damage in rhododendrons and azaleas. Genetic engineering could possibly incorporate just such a protective mechanism into our cultivars if costs become low enough. Conventional breeding techniques, a form of genetic engineering really, are currently being applied to azalea hybrids in Northern America in an effort to take advantage of a few naturally lace bug resistant azalea species.

Control

In the meantime, most of us are faced with the problem of lace bug attack or the potential for it. We need to consider the most appropriate response in our particular situation. The vexed question of whether or not to use chemical control is one that warrants serious consideration. One's own personal philosophy in these matters will no doubt determine the approach.

The apparently rapid proliferation of rhododendron and azalea damaging lace bug in many areas of Australia in recent times would appear to indicate that suitable predators are either not plentiful or not very effective. Like their host plants they are introduced species after all. In the Adelaide Hills lace bug wasn't a general problem until probably 15–20 years ago, despite the early introduction of rhododendrons to the State. It has certainly become a major problem now.

Despite the reluctance of probably most of us to use chemical agents in our gardens, it seems to me that sooner or later it will be the only practical and effective option available, particularly where susceptible varieties are grown.

My choice in my situation is for a carefully targeted application of a systemic insecticide only on affected plants "as required". By this I mean whenever the slightest lace bug activity is detected or if eggs are known to be present on the plant and seem about to hatch. This approach is designed to minimize the impact on beneficial predators in the wider garden. I certainly favour a zero-tolerance policy toward lace bug on the grounds that it is far easier to deal with a small number, perhaps quite often at times, than be forced into a blitzkrieg when the situation is nigh out of control. This latter measure will almost certainly harm many useful insects and upset an otherwise acceptable balance between the multitude of insects in a garden.

To this end, I keep a pump-up pressure spray at hand loaded with working strength spray ready for immediate use. There seems no need to wash out and dry the plastic units after use. Systemic insecticides work initially as a contact spray, but as the chemical is taken up into the leaf structure and sap it is rendered locally toxic to a range of leaf and sap feeding insects for up to about three or four weeks. Rogor, Confidor, Folimat and Orthene appear to be popular and effective systemics. If one is uncomfortable with such potentially dangerous chemicals, "soft" alternatives such as insecticidal soaps may be quite effective, especially at the nymphal stage.

Acknowledgments

I am indebted to various members of the Society for their assistance in gathering material for this article. In particular I am most grateful to David Cartwright and Gail Barth for kindly reviewing my original draft and for their valuable suggestions and corrections. Staff members of the Museums of SA, Queensland and Sydney were particularly helpful also.

Rod Capon is Secretary of the Society's South Australian Branch. A retired Technical Officer who worked 40 years in the aviation industry, mostly in radar at Adelaide Airport, he and "garden-wise" wife Fay live at Crafers in the Adelaide Hills. Managing to cope (just) with a fairly large garden of a "couple of acres", Rod had no particular interest in rhododendrons until afew years ago. A family man with six children and 11 grandchildren, his interests include science, photography, pipe organs, and wine making (he had a vineyard once).

It's not easy being green … and clean!

Ted Cutlan

Tasmania enjoys the wonderful image of having a clean green environment and, to a large extent it is well deserved. One consequence of this image is the need for protection against new insect pests and diseases. As a result we have some very strict rules on the importation of cut flowers, food crops and ornamental plants into the state. To use the words of the famous frog:

It's not easy being green (and clean).

The national conference of the ARS is being held in Victoria later this year and no doubt many of our Tasmanian members will be attending. While they are visiting gardens such as the National Rhododendron Gardens at Olinda some may wish to purchase plants and bring them home.

Well have I got news for them!

No it's not all that bad. There are protocols however and unless our plant collector (who may have just found that rare bulb, rhodo species or perfect plant) is prepared to satisfy the requirements of the Department of Primary Industry and Fisheries, Quarantine in Tasmania they may well be disappointed.

To put it simply all plants coming into Tasmania must have a Plant Health Certificate (PHC) issued by Agricultural Victoria Plant Standards. Without a PHC the plants will probably be confiscated and destroyed. If plants are purchased from a nursery which is accredited for both argentine ants and Western Flower Thrips (WFT) then all is well with the world. The plants can come straight in with the appropriate documentation. The problem is that only wholesale nurseries sending plants to other states usually fulfil both of these requirements. Accreditation is a process which involves meeting strict requirements of weed control, pest management, cleanliness etc., and WFT is a fairly new pest, similar to other thrips, but more difficult to control.

Since the average rhodo collector is shopping at retail nurseries they will find that most are not accredited for argentine ants and WFT. Having said this there are some accredited nurseries that are both wholesale and retail.

So, plan B!

This is fairly drastic but guarantees success. It involves inspection at Footscray followed by gassing with methyl bromide. Agriculture Victoria knows how to charge for their time so it is well worth taking the plants to them, rather than them having to travel to the Dandenongs.

Now many of you would know that methyl bromide is a particularly nasty chemical for the environment, and plants don't like it much either. A healthy plant should however survive albeit with possibly some damage to foliage.

In researching this article, I was told that the best way to keep the cost of this process down was to get them put in with the fruit and vegetables that are coming over to Tasmania when they are being gassed.

Lovely I thought! Better do some more research I thought! Don't tell the general public but tomatoes, capsicums and other hosts of fruit fly are gassed with methyl bromide if they don't have certification. I have also learned that many of the fruit and vegetables that we eat are dipped in dimethoate. That's right, the good old Rogor we use to kill all the nasties in the garden. Now if you're a mainlander reading this and think that we are mad in Tassie to eat this stuff you're right, but it affected you too. These procedures are commonly used Australia-wide.

Plan C

Pretty desperate at this stage. Plants can be sealed in an insect proof container and sent to quarantine in Tasmania for treatment here. The Quarantine facility for gassing in Hobart has been closed temporarily though, and so a private operator, such as the Hobart Cool Stores now does it, and there is a minimum charge. This is not the preferred option but if plants are to be brought in and gassed here it pays to contact the port of entry prior to the trip. The person in Devonport is Mr Peter Johnson and contacting him before the journey makes everything much easier on arrival back in Tasmania. Devonport does have facilities for gassing.

Since there could be quite a few people going to the conference from Tasmania, and they may each buy plants, one thought is to try to send all the plants to the gas chamber together as in plan B and then to the carrier. Alternatively one member could bring them all back in their vehicle on the *Spirit of Tasmania* to be gassed in Devonport.

More work needs to be done but I hope that as you read this we have found a solution to make it easier for individual members.

One thing stands out in all of this.

There are systems in place and although they may be onerous, the need for them is clear.

For the sake of our clean green reputation and our own gardening peace of mind I hope no one is tempted to do the wrong thing. Beware of the dog – the beagle will get you. ❀

About the author

Ted Cutlan is the immediate past president of the Southern Tasmanian Branch of the ARS

He has worked in both retail and wholesale nurseries and currently runs a wholesale rhododendron nursery with his wife Joy Stones.

Their garden of approximately half a hectare features over 600 rhododendrons with an emphasis on hybrids. They have been bringing new stock in from the USA and New Zealand.

The garden will be open to the public through the ABC's Open Garden Scheme on 4 and 5 November this year.

Osmosis and plant nutrition

Michael Hammer

What is osmosis?

Imagine we take a container and fill it with water. The water consists of many tiny molecules in constant movement. As these molecules move around they collide with the walls of the container and bounce back, millions upon millions of collisions per second. Each collision exerts a tiny push on the wall and the overall result of all these collisions is a net force on the walls of the container which we call "pressure". The pressure is simply a measure of the number of collisions per m^2 per second.

Next, imagine we put a barrier down the middle of the container (see Figure 1) so that there is water on both sides of it. Further, we make this barrier out of a material which has tiny holes in it. These holes are far to small to see, but they are large enough to allow a water molecule to fit through. The water molecules will collide with this barrier just as they collide with all the other wall surfaces. Most of the time they hit a solid part of the barrier and bounce back, but occasionally they will strike the barrier where there is a hole and pass through it. Thus, referring to Figure 1, some water molecules from side A will end up moving into side B and vice versa.

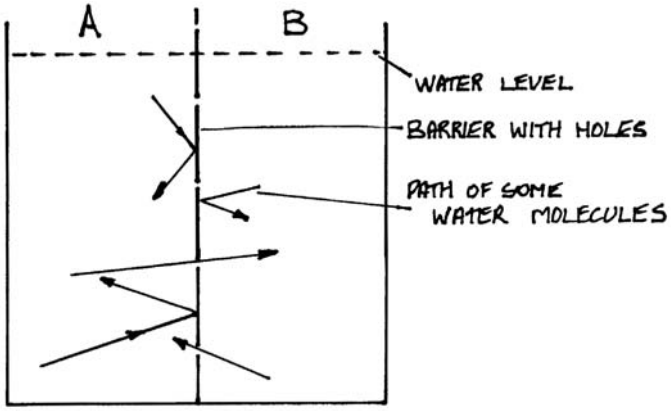

Figure 1

Now imagine we dissolve some salt into side A of our container. Salt molecules are larger than water molecules, and if the holes in our barrier are of the right size they can be big enough for the water molecules to pass through but too small to allow the salt molecules through. Since the pressure on both sides of the barrier is the same, the total number of collisions per second on both sides of the barrier will be the same, but, on side B all collisions are due to water molecules (which can fit through the holes) whereas on side A some are due to salt molecules (which cannot fit through the holes). Fewer water molecules strike the barrier per second on side A than on side B and thus fewer water molecules will pass through the barrier from side A to B than from B to A. There is a net movement of water from the side of low salt concentration to the side of high salt concentration.

This effect is called "osmosis" and the sort of barrier we've just talked about, with holes large enough for some molecules and too small for other molecules is called a semi-permeable membrane. Of course we do not have to use salt, any substance which dissolves and has large molecules will cause the same effect.

Osmotic pressure

The flow of water from one side of the membrane to the other occurs simply because there are more collisions per second of water one side of the membrane than on the other. The flow will continue until the number of collisions per second of water molecules becomes the same on both sides of the membrane. This can occur in two ways.

Firstly, if the migration of water causes the concentration of dissolved solids to equalize on both sides of the membrane. This could occur if there was material dissolved in the liquid on both sides of the membrane but at different concentrations.

Secondly, if the migration of water raises the physical pressure on the more concentrated side of the membrane. More pressure means more collisions per second and if the pressure is raised enough, the number of collisions due to the water component will balance. This forms a convenient way to measure the osmotic strength of a solution and leads to the expression "osmotic pressure" as a measure of the osmotic strength of a particular solution.

Imagine we have a semi-permeable membrane in the form of a closed sack with an aqueous solution of salts inside it. If we place this sack in a solution with more dissolved solids (greater osmotic pressure), water will be drawn out

Rhododendrons and stamps

see page 11

R. emarginatum, see page 41.

R. 'Triumphans', see page 55.

R. edgeworthii at Mount Lofty Botanic Garden

The Rhododendron Trail at Mount Lofty Botanic Garden: *R. macabeanum* (above) and massed azaleas in the Rhododendron Gully..

The Rhododendron Trail at Mount Lofty Botanic Garden: *R.* 'Florence Mann' (above) *R. arboreum* ssp. *zeylanicum* (below).

of the sack and it will start to collapse. If we place the sack in a solution with less dissolved solids (lower osmotic pressure) water will flow into the sack and it will start to swell.

So why is all this relevant to us as gardeners? Well, it turns out that many membranes in nature are semi-permeable. In particular cell walls are semi-permeable membranes. We may not realize it but we are constantly experiencing the effects of osmosis in everyday life. Here are some everyday examples;

Some examples of osmosis

You cut yourself – put seawater on it and it hurts. The osmotic pressure of seawater is much higher than the inside of your cells (seawater is about 2–3% salt); the exposed cells start to lose water and collapse. Put fresh water on it and it also hurts, the osmotic pressure of the fresh water is too low; the cells gain water and start to swell. If you bathe the cut in water with 0.9% salt (saline) however it doesn't hurt at all: the osmotic pressure of the saline is just right. Try it next time you want to wash a cut or graze – add 9 grams of salt (about 2 level teaspoons or 1 heaped teaspoon) to a litre of boiled water. You should find that it is much less painful. Of course, be careful – don't add too much salt or the osmotic pressure will become too high and it will hurt again.

In the past people used to salt meat to keep it from spoiling. Why? The bacteria that attack meat do not have an impermeable skin; they have cell membranes that are semi-permeable. The osmotic pressure of the salt is so high, it sucks the water out of the bacteria cells and kills them. By the way, that is the basis for the belief that bathing a wound in seawater helped to fight infection.

Salt is not the only chemical that raises osmotic pressure. Any soluble molecule large enough to be blocked by the holes in the membrane has a similar effect. One very important class of molecule with a similar effect are the sugars. Bacteria use sugar for food just as we do. Despite this, a strong enough sugar solution will raise the osmotic pressure high enough to kill bacteria and thus prevent spoilage – that's why jams and honey keep well without refrigeration. If you don't believe me, try diluting honey with some water and leave it out for a few days. Compare its lasting qualities with undiluted honey.

The membranes of plant cells are also semi-permeable. There are some simple experiments you can do to show this. Put some raw cucumber slices in a bowl of fresh water and others in a bowl with saturated salt water. The slices in fresh water swell up and become very turgid. The ones in salt water collapse and become completely limp.

Take a half a raw potato, scoop a recess in the cut face and put in a spoonful of salt or sugar. Leave it for an hour or so and you will find the recess filled with liquid, while the potato around the liquid has gone soft and spongy. Some of the salt or sugar dissolves in the little bit of water around the cut face and the high osmotic pressure of this solution draws out more water from the potato cells. Try it with a cooked potato and nothing happens. Why? Cooking destroys the cell membranes so that osmosis can no longer occur.

Effect of osmosis on plants' collection of water

Root hairs on plants, like other cells, are also semi-permeable. Water gets through readily but dissolved nutrients cannot. Plants, in fact, rely on an osmotic pressure gradient in order to collect water. The concentration of dissolved solids, and thus the osmotic pressure, rises continuously from the soil around the roots to the central water conducting core of the root (called the xylem) and this causes water to flow into the plant. Remember we said osmosis can result in a physical pressure difference across the membrane – this means that the physical pressure is higher in the core of the root than in the soil around the plant. On cool mornings especially, when the soil is damp, you can sometimes see drops of water all round the edges of the leaves on some plants. This arises because the osmotic pressure gradient has forced so much water into the plant it flows out through the ends of the veins at the edges of the leaves and collects as droplets. Botanists call this process 'guttation'.

By the way, as an aside, did you know that plants cool themselves by evaporating water the same way we do when we perspire? This partly explains why plants burn much more easily when they dry out. Without enough water to evaporate they can't cool themselves adequately and the leaves overheat and die.

The primary molecule raising the osmotic pressure inside plant roots is sugar – manufactured in the leaves and transported down in the phloem tissue to the roots. Plants to some degree can control the osmotic pressure inside their roots. This is done by converting sugar to starch or vice versa. Starch is only sparingly soluble, so it does not contribute much to osmotic pressure. If a plant wants to reduce its osmotic pressure it converts some sugar to starch. To raise the osmotic pressure it can convert some starch back into sugar.

Root hairs do not just collect water for the plant, they also collect nutrients by a separate process called active transport. For this process to work, however, the nutrients have to be dissolved in water. Nutrients in an insoluble form cannot be absorbed by the plant. For example, you can't address an iron deficiency for an azalea by putting some iron filings around the plant. The iron may be there, but it is not in soluble form, so the plant can't take it up. And herein lies a paradox, exactly the same as for the bacteria in honey. Because the nutrients are soluble in water they also raise the osmotic pressure outside the root hairs. A higher nutrient level means more food but it also makes it harder for the plant to collect water. If the nutrient concentration becomes too high the osmotic pressure outside the roots becomes greater than inside the roots. When that happens the flow of liquid reverses. Instead of the plant taking up water and nutrients it can't take up anything. Instead it starts to lose water into the surrounding soil. The plant dehydrates, the leaves are starved of water, they dry out, die and go brown around the edges. We say the plant is being burnt. If the situation lasts too long the plant dies.

Controlling osmotic pressure around plant roots

How can the osmotic pressure get to be higher in the soil than in the plant? Firstly and most obviously, you put too much fertilizer around a plant. Less obviously, you fertilize a plant when the soil is very wet, the fertilizer is well diluted and at a reasonable concentration for the plant. Then along comes a dry spell, the soil around the plant starts to dry out. Water is lost but the nutrients cannot evaporate, they stay in the soil and the concentration rises and rises. Eventually it gets so high the osmotic pressure reverses and goodbye plant. Another problem is especially relevant to pot plants. Every time you fertilize you add more nutrients to the pot. Normally you add far more nutrient than the plant can actually use. The excess cannot escape and builds up around the plant roots. Eventually the level reaches toxic levels, and as mentioned already this is exacerbated when the mix in the soil dries out a bit. To avoid this, one is told to periodically deep soak pot plants to wash out the excess nutrients.

But another issue needs to be considered as well. What is the osmotic pressure inside the plant? If this is high enough the plant can cope with a higher concentration of nutrients in the soil. Remember sugar was the main molecule raising osmotic pressure inside plants. The osmotic pressure is likely to be highest when there is a lot of sugar around and this occurs when the plant is producing the greatest amount of sugar – and when is that? When it

is most active – when it is growing most rapidly. Conversely the sugar level is likely to be lowest when the plant is dormant. Hence the advice to fertilize plants when they are growing rapidly and the caution to not fertilize when the plant is dormant.

What about cuttings? The greatest problem for a cutting is loss of water. Further, the cutting is using up food reserves to produce new roots. Sugar levels are likely to be pretty low and this means the osmotic pressure inside the plant will also be low. A bad combination. The last thing a cutting in that position can cope with is high osmotic pressure outside the fledgling roots. We want to make the osmotic pressure outside the cutting as low as possible. Fertilizer for a cutting is like poison. It is not that the cutting can't use the nutrients. That is irrelevant, it would only mean the fertilizer was wasted. The problem is that the nutrients raise the osmotic pressure and dehydrate the cutting. In fact we probably should be thoroughly washing our mix to remove every trace of dissolved solids to get the osmotic pressure as low as we possibly can.

Regulating the nutrient level around plants

One of the challenges for us as gardeners is to regulate the nutrient level around our plants. Plants can cope with considerable variation in the level of nutrients around the roots, but they do better if the level is more stable. That's why the comment is made that it is better to fertilize more often with very weak fertilizer than it is to use stronger fertilizer occasionally.

Let's look a bit at ways in which nutrient levels can be stabilized around plants. The key here is that nutrients are available to plants and affect the osmotic pressure only if they are in solution. Nutrients not in solution are completely inert as far as the plant is concerned. You know, what would be really nice would be to have some mechanism which stored nutrients in the soil in an insoluble form, and slowly converted them to a soluble form at a rate which keeps a constant level around the plant. You often hear comments that organic fertilizers – compost, manures etc. are far better than chemical fertilizers. Environmentalists and "greenies" often wax so lyrical, it seems as though the nutrients from organic fertilizers are good and healthy while the nutrients in chemical fertilizers are evil and poisonous. That of course is utter rubbish, a potassium ion is a potassium ion whatever the source. Organic fertilizers do, however, have a major advantage. The nutrients in chemical fertilizers are in a readily soluble form. Very shortly after the fertilizer is applied

to the soil, the nutrients dissolve raising the nutrient level and osmotic pressure. The nutrients in organic fertilizers however are often locked up in complex organic compounds and do not dissolve readily. When they are applied to the soil it requires the action of microbes in the soil to break down these organic compounds, and thereby release the nutrients to dissolve in the soil water. Thus organic fertilizers provide a slow steady nutrient release. In more recent years, inorganic fertilizers have become available which can at least partly match this action. Fertilizer granules are coated with a polymer which prevents the fertilizer dissolving all at once. Instead the nutrient material slowly leaches through the polymer barrier. Depending on the thickness and composition of this barrier, the leaching process can take three, six or nine months. Several proprietary brands are available, of which the best known is probably Osmocote – the name probably comes from a contraction of "osmotic coating".

There is another advantage of organic fertilizers. They leave a residue of partly-decayed organic matter in the soil – called "humus". This humus changes the way in which soil particles stick together, and also has the property of binding and trapping both water and nutrients. Nutrients can continuously attach and de-attach themselves to humus particles – called an equilibrium reaction. When the nutrient concentration in the soil is high, the rate of attachment exceeds the rate of separation. The net effect is that some of the nutrients bind to humus particles and are effectively removed from solution. When the dissolved nutrient level falls, the equilibrium swings the other way and the attached particles go back into solution. In short, the humus acts to stabilize the dissolved nutrient level in the soil water. Exactly what we discussed just before. Chemists call this process buffering. Thus organic fertilizers provide a buffered source of nutrients whereas chemical fertilizers are an unbuffered source.

Humus is not the only thing which can do this. Clay particles such as felspars, silicates etc. are chemically active materials. Nutrients can adhere and detach from them, just like happens with humus. Again, when nutrient levels are high, attachment predominates and the nutrients are removed from solution but still bound in the soil so that they are not washed away. When dissolved levels fall again the bound nutrients detach, raising the dissolved levels again. By contrast, sand is silicon dioxide which is chemically inert. Nutrients cannot attach to sand particles. As a result, the nutrient level fluctuates much more in sandy soils than in clay and nutrients are much more easy washed away and lost. Clay soils may have problems with poor aeration, compaction and water logging but they are generally more fertile than sands.

Nutrient availability versus pH

Osmosis explains how plants absorb water from the soil but it does not account for the way in which a plant collects nutrients. In general collection of nutrients is a more complex active process. A pumping process which requires the plant to expend energy. It is also a process that varies very greatly from one type of plant to another. In general, if a plant species is growing in an environment where a particular nutrient is very scarce it evolves very efficient ways of collecting that nutrient. Conversely, if the plant grows in an environment where a particular nutrient is very plentiful the collection efficiency for that nutrient can be expected to be very low. Indeed, if the nutrient is normally present in excessive amounts the plant may even develop mechanisms to reject that particular nutrient. A simple example of that is plants that colonize the tidal margins such as saltwater mangroves. In these locations the sodium concentrations – at least – are much higher than the plant can possibly use and these plants need to develop mechanisms to selectively excrete the excess sodium.

If a plant has developed in a region where a particular nutrient is very low and is suddenly placed in an environment where there is a large amount of the nutrient, its super-efficient collection mechanism means that it will collect far too much of the nutrient – possibly a toxic level. Such a plant has no means of getting rid of the excess, because it evolved in an environment where such a mechanism was not necessary. This is, for example, the situation for many Australian natives with regard to phosphorous. This does not mean that Australian natives use less phosphorous for growth. It only means they are more efficient at collecting it and therefore require lower levels of this element in the soil.

Conversely, if a plant species evolved in a region where a nutrient was very plentiful, and is placed in a new environment where that nutrient is much less plentiful, then the plant may suffer a deficiency simply because it has not developed efficient mechanisms for collecting that nutrient. A good example of that is the rhododendron genus with respect to iron. Rhododendrons are so inefficient at collecting iron they can suffer chlorosis at available iron levels which would be more than adequate for, say, vegetables.

Remember, a nutrient is only available if it is in solution. It is quite possible for plenty of the nutrient to be present yet not in solution - it may be present as an insoluble salt. A major factor influencing this is the pH of the soil. You can easily show this with a simple experiment. Put some ferrous sulphate (sulphate of iron) in water and shake it up. The ferrous sulphate dissolves to form a clear

green solution. Now add some washing soda (sodium carbonate) or some caustic soda (sodium hydroxide) and shake again – either of these materials will make the water alkaline. Immediately a dirty brown precipitate forms and the green colour disappears. That brown precipitate contains the iron converted to an insoluble form, a form which is useless to plants. That is why adding ferrous sulphate to alkaline soil makes very little difference to azaleas, as the ferrous sulphate is immediately converted to insoluble form.

One needs to change the soil pH, not the total iron level. An alternative solution is to add the iron in a form which is not readily rendered insoluble – iron chelates. Iron in this form is unfortunately relatively expensive.

This interdependence between availability and pH applies to most soil nutrients. In can be shown in diagram form (Figure 3). The issue of nutrient availability is in fact the main reason behind plant sensitivity to pH. Thus vegetables, which grow quickly and need large amounts of the major nutrients nitrogen, phosphorus and potassium, grow best at a pH between about 6.5–7.5. Plants that have trouble collecting enough iron, such as rhododendrons, grow best at a pH between about 5 and 6.

Controlling pH

If we find our soil is too alkaline (pH too high) can't we lower it by adding an acid? For example could we add some hydrochloric acid (brick cleaning or pool acid)? Conversely if the pH is too low can we add some sodium hydroxide – caustic soda? The simple answer is no, that will not work. It will either do nothing or it will kill your plants. The problem is a little bit similar to the problem with chemical fertilizers that fully dissolve as soon as applied.

Imagine I take 1 l of distilled water which will be pH7 or neutral. If I add one drop of hydrochloric acid the pH will fall from 7 to 3. Well, okay, we know hydrochloric acid is a very strong acid, so maybe I just used too much – if one drop per litre gave pH3 then one drop per 100 l should give pH5. True it will, but then one drop of similar strength caustic soda will take you back to pH7 and two drops would take you to pH9! You may be able to get the water to pH5 using hydrochloric acid but you could never keep it there. The problem is that all the acid is fully expressed. This firstly means that its initial effect is far too severe, and secondly there is nothing in reserve to keep the pH stable against external factors that could change it. So it swings up and down like a yo-yo. Just as with fertilizers, we come up against the concept of buffering. We want the pH not only to be correct, but also to stay correct despite perturbing factors. In

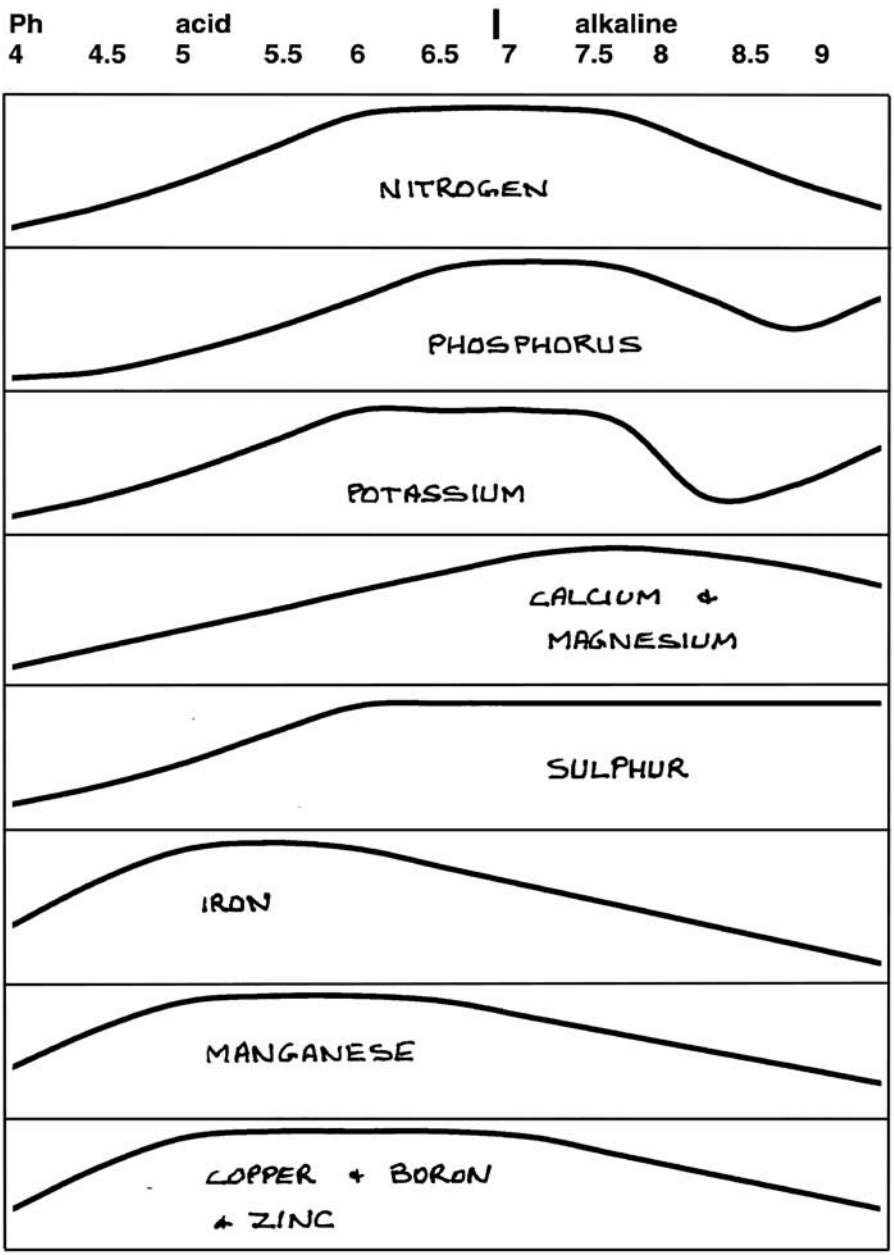

FIGURE 2 Nutrient availability verses pH. The higher the graph, the more nutrients are available.

practice all soils have natural buffering – they all resist changes to pH to some degree. The smaller the amount of buffering the easier it is to change the pH, but the more readily the pH will drift away from the desired level, i.e. the less stable the soil. The greater the buffering the more stable the soil but the harder it is to change the pH. That, by the way, is why adding a bit of hydrochloric acid to the soil would probably have no effect – the natural buffers in the soil would neutralize it without any significant change to the overall pH.

Just as we discussed before, and for much the same reasons, sands exhibit a low level of buffering, whereas clays and humus rich soils exhibit a high level of buffering. We need more material to change the pH of clay soils than we need for sandy soils. Indeed, in some cases the soil can be so well buffered that it is almost impossible to make any meaningful change to pH. This is especially the case for limestone rich soils which are naturally alkaline.

If we want to make any meaningful change to soil pH we need to use materials which exert a strong buffered effect. They may not push the pH very far, but they exert a lot of force to maintain the change despite other influences. Just as for fertilizers, this implies materials which are expressed slowly. Materials expressed quickly may make a short term change to the pH but it will tend to drift back as the material added becomes exhausted.

There is a very convenient material we can use to make soil more alkaline (raise the pH) and that is lime. It is rapid in initial action and the effect lasts for quite a long time. Unfortunately the word lime is used for two distinctly different chemicals. Slaked lime or "builder's lime" – sold under the name Limil around here – is calcium hydroxide. By contrast, "garden lime" is calcium carbonate. Another similar material often recommended is dolomite, which is a mixture of calcium carbonate and magnesium carbonate. Calcium hydroxide – builder's lime – is much more strongly alkaline, and therefore more likely to burn plants and even unprotected skin. Therefore, in principle, calcium carbonate is a better choice. In practice, calcium hydroxide rapidly absorbs carbon dioxide from the air and in the process it is converted from calcium hydroxide to calcium carbonate, so in the long term there is not much difference. By the way, that is why formulations which call for calcium hydroxide lime, for example Bordeaux mixture, always stipulate that the lime should be fresh. Nonetheless garden lime, or – probably even better – dolomite, would be the better first choice for making soil more alkaline.

There is no equivalent material for making soil more acid. Sulphates in general, e.g. ferrous sulphate, magnesium sulphate, aluminium sulphate (hydrangea blueing agent) or ammonium sulphate will all have a fairly rapid acidifying effect but it is not particularly long term. Elemental sulphur lasts longer because it is slowly converted into sulphates by the actions of soil bacteria and water, but for the same reason it is significantly slower in its initial action. A good alternative, however, is to use compost. Compost is naturally acidic, and as stated earlier improves the buffering of the soil both with regard to pH and also nutrients and water retention.

Conclusions

Gardening is a very rewarding pursuit and you don't need to be a chemist to be a good gardener, Nonetheless, sometimes just a little background knowledge can help to give greater insight and avoid problems that can otherwise lead to much frustration and lost plants. In this way it can make gardening an even more rewarding pastime and hobby. ❀

About the author

Mike Hammer has been interested in both science and gardening since early childhood. The former interest was encouraged by his parents and the latter by the privilege of growing up on a 2 acre property which in the 1950s was semi-rural (although now well inside the suburbs).

He studied electrical engineering at the University of Melbourne, graduating in 1975 with bachelors and masters degrees. Since then he has worked as a research engineer and manager for Varian Australia, a high technology manufacturer and exporter of scientific instruments.

Mike and his wife Inge always dreamed of living on a large property in the mountains, but still close to the city. In 1989 a chance remark from a business colleague led them to look into a six acre property for sale at Sassafras on Mount Dandenong. It turned out to be the encapsulation of their dream - half temperate rain forest with a creek, and half rhododendron jungle (from plantings in the 1920s and 1930s). Resident there since 1991, they've been happily building a new house and redeveloping the extensive garden.

Rhododendron emarginatum

The first flowering in Victoria of a vireya rhododendron species from Vietnam.

R.M. Withers

The Rhododendron Vol. 26, No. 2, December 1986, included an article I wrote in conjuction with the late John Womersley, entitled "The Non-Malesian Rhododendrons, Section Vireya". In this article was a description of *R. emarginatum* Subsection Pseudovireya, Hemsl. & Wilson, Kew Bulletin (1910) page 118.

R. emarginatum was described as being a Chinese species of *Rhododendron*, very distinct from all other Chinese species, and native to Yunnan, in mountains southwest of Mengtsze.

In May 1992 a group of plant collectors including Bob Cherry from Australia and Keith Rushforth from England were collecting in the north of Vietnam on Fan Si Pan, the tallest mountain in that country. At 3,143 m (10,308 ft), close to the border with Yunnan province in China, they found *R. emarginatum* growing. They collected it and introduced the species to cultivation.

Several years later Bob Cherry gave me a small plant which has grown well in Victoria in the Melbourne climate. My plant is now growing as a prostrate type of plant 60 cm in diameter with the tallest stem 45 cm in height. It has obovate emarginate leaves 3–4 cm long and 1.5–2 cm wide. Cuttings strike easily.

Bob Cherry's plants commenced to flower several years ago in his warmer more northerly climate, but my plant flowered for the first time in July 2000 with a single flower opening on July 5.

The flower is small (about 2 cm in diameter with the tube 0.8 cm in depth) but beautiful. It is tubular-campanulate in form, with six flat corolla lobes yellow in colour with orange pollen. A photograph taken at the time appears in the centre pages. ❀

The Rhododendron Trail at Mount Lofty Botanic Garden

Robert Hatcher

The South Australian Branch of ARS, through then President Dr Allan Kerr Grant, first proposed a Rhododendron Trail for the Mount Lofty Botanic Garden to the Director of the Botanic Gardens of Adelaide in 1994. The proposal reached fruition in October 1999.

It was one of two new trails launched that month by the Premier of South Australia, the Hon. John Olsen, at the same time as the opening of new visitor infrastructure at Mount Lofty including a new carpark, upgraded paths, new paths and directional signs. The other walking trail is the Magnolia Trail.

As well as making a financial contribution to the project, the SA Branch of the Society had input as to which points of interest within Rhododendron Gully should be selected for inclusion. I was the Mount Lofty Botanic Garden staff member responsible for carrying out research on these, which involved assembling information about selected rhododendrons and plants often found in association with them. This was used to create interpretative material to be provided to Garden visitors.

After some minor alterations to the walking route, the information was formatted into a brochure which includes a map with points of interest marked and numbered. These numbered points of interest are marked along the trail by jarrah marker posts with brass numbers corresponding to the information in the brochure.

The selected points of interest from 1 through 11 are as follows:

1. *Rhododendron ponticum*
2. Vireya rhododendrons
3. Rhododendron evolution
4. Asian rhododendrons
5. Evergreen azaleas
6. Large leaf rhododendrons
7. *Rhododendron nuttallii*
8. *Cercidiphyllum japonicum* – Japanese Katsura tree

9. *Rhododendron decorum*
10. *Magnolia campbellii*
11. Deciduous azaleas

The trail is designed to be walked either downhill from the top of Rhododendron Gully, which is not far from the Mawson Drive carpark, or in reverse order from the bottom of Rhododendron Gully. It takes from 45 to 60 minutes to walk in either direction, depending on how long the visitor spends at each point of interest marked by a station. Trail brochures are available from dispenser boxes placed at the start of the trails or on request.

Mount Lofty has between 240,000 and 250,000 visitors per annum, and since the trail opening, visitor comments about it have been very positive.

The Garden has an average annual rainfall of 1,200 mm and ranges in altitude between around 520 and 600 m above sea level. Different microclimates within the Garden allow a wide choice of suitable growing conditions for rhododendrons.

Rhododendron Gully was first planted in the early 1960s, and was planted steadily over the following years. In the summer of 1983 it received a serious setback, when half of the Garden including the Gully was ravaged by wildfire in the "Ash Wednesday" fires. The majority of the lower portion survived intact and, remarkably, many of the rhododendrons in the Gully survived. New plantings after the fires have added significantly to the total number of species. Sources included rhododendrons contributed by Australian Rhododendron Society branches.

Development has continued since with the introduction of many new species each year. The collection of rhododendrons now includes a large variety of species and cultivars, including examples from the smallest-growing to the largest, and the Gully is well endowed with their typical companion plants in the wild. The garden has 1,052 accessions of rhododendrons. Of these 314 accessions are cultivars, and 738 species. There is, of course, some duplication in these numbers – the approximate numbers of different cultivars and species total around 220 and 500 respectively. ❀

Robert Hatcher is Acting Interpretative/Education Officer at the Mount Lofty Botanic Garden.
South Australian Branch President, and former National President, John Schutz, heads the management of the Garden.

Vireyas Victorious

Brian Clancy

For the first time in the history of 40 Annual Shows, vireya species won the Dowd Trophy at the Annual Rhododendron Show held by the Society's Victorian Branch at the National Rhododendron Gardens, Olinda, from October 30 to November 2, 1999.

The Dowd Trophy is awarded for the best three rhododendron species, one spray or truss of each, staged separately in Sections of the competition open to both professional and amateur growers. To win this prestigious trophy it is necessary to exhibit flowers of three separate species in perfect condition in open competition. The Dowd Trophy was first awarded in 1964 to an exhibit by our Foundation President, Mr Alf Bramley, who was a professional nurseryman.

My prize-winning exhibit for the Dowd Trophy consisted of one of the oldest-collected vireya species, *R. javanicum*, a selected cultivar of *R. laetum*, and *R. rarilepidotum* – collected as recently as 1988. Details of these species are as follows:

R. javanicum is one of the best and oldest known vireya species in cultivation. In *Gardeners' Chronicle*, June 21, 1879, J.H. Mangles wrote that "*R. javanicum* is figured in the *Botanical Magazine* Vol. LXXV, (1847) and Sir William Hooker thus describes it:

> 'On communicating this splendid plant to me for figuring in the *Botannical Magazine*, Messrs. Veitch & Sons, its possessors, remark that it is certainly one of the finest things ever introduced to our gardens, and in this opinion we think all will agree who see the present representation, and more especially those who have the privilege of beholding, as we now do, the plant itself with its beautiful grossy bright green foliage and orange colored flowers, (twelve in a bunch), here and there marked with red spots, and again spotted as it were, with the dark black-purple anthers, which lie generally five on each side towards the lower side of the mouth of the corolla. Blume discovered it on the Mountain Salak, in Java, in dense forests, at an elevation of 4,000 feet above the level of the sea.' Hence we are not surprised to learn from Mr Veitch that it succeeds well under the mere shelter of a greenhouse."

R. javanicum is widely distributed over 12 islands of the South Pacific and is a variable species. The rather fleshy flowers sometimes vary from yellow to red but are mostly found in various shades of orange. The prize-winning exhibit of this species had ten bright orange flowers with a pink-purple throat and red anthers.

R. laetum: the only collection extant of this species was collected in the wild of the Arfak Range, Dutch New Guinea (now Irian Jaya) by Dr H. Sleumer and his colleague, Mr W. Vink, in January, 1962. In late December, 1961, Dr Sleumer had completed his collecting expedition to New Guinea, when, rather fortuitously, he was offered helicopter transport to the Arfak Range by the Forest Authority. So, on January 8, 1962, Sleumer and Vink with 750 kg of equipment were flown from Ranski, on the coast, over the 2,300 m. high outer edge of the Arfak Range direct to a landing spot near the Angi-gita lake at a height of 1,840 m. This journey was completed in 12 minutes compared to previous botanists such as Gjellerup (1912) Gibbs (1913) and Kostermans (1948) who encountered much toil to complete the trip on foot in three to four days. Suddenly, after the brief flight, Sleumer and Vink found themselves in the midst of a wonderful mountain world with a Mediterranean climate replete with flowering Vireyas and orchids. On January 22, they slogged for seven hours along the shore of Lake Angi-Gita, over Tridaga and thence to the point where the River Dwons entered the lake. After crossing the river on a swaying bamboo bridge they waded through an extensive swamp for a further two hours. Then the only thing which cheered Dr Sleumer out of a deep depression was the sight of *R. laetum* which was flowering freely throughout the swamp. The plants were absolutely exposed to full sun and the flowers were pure yellow on opening, gradually changing to a reddish-orange on the lobes in later stages. I grew a large number of plants of *R. laetum* from this collection of seed. The specimen exhibited in the competition was cut from a selected cultivar with nine, pure yellow, wax-like corollas.

R. rarilepidotum was collected under number GA3/1988 by Dr George Argent in Northern Sumatra (Indonesia) in 1988. Full details of the collection, growing and flowering of this species were featured in *The Rhododendron* Volume 39, 1999 (pp. 25–28). From this collection, a perfect 24-flowered, formal truss completed the trio of species exhibited in the competition.

Best flowering of vireya species under climatic conditions in metropolitan Melbourne, is obtained in autumn and early winter. In my backyard, flowers of vireya species can be found every week of the year. The flowering of *R. laetum* is outstanding in March–April and then intermittently throughout the

year. On the selected plant of *R. javanicum*, one or two flowers can be obtained throughout the year with best flowering in early Spring. Over the past two years, *R. rarilepidotum* has flowered two or three blooms every two or three weeks over a period of four months commencing in October.

In conclusion, it is interesting to note that when I maintained the vireya display in the glasshouse at the National Rhododendron Garden, Olinda, for seven years in the 1970s, I was able with foliar feeding to show international visitors flowers of *R. lochiae* every week of the year. ❀

Annual Event 1999

Lesley Eaton

In 1999 the Rhododendron Society's Annual Event was hosted by the Emu Valley Rhododendron Society branch of the Society in Burnie, Tasmania. As always, our host branch arranged a varied and stimulating number of events to satisfy even the most discerning of our members. Southern Tasmanian members turned out in force and they were supported by members from South Australia, Victoria and a good number of the local branch members.

On the Friday evening National Council members were treated to a sumptuous light meal prepared by a talented group of ladies before settling down to the business side of running the Society.

Unfortunately, weather wise, the gods forsake us on the Saturday morning. However, we had all come prepared with wet weather clothing and the rain did not deter us from enjoying the garden of Lexieand Athol Dicker at Cuprona. This beautifully designed and maintained garden gave our members much to admire. There were many rhododendrons in flower including some good vireya specimens. The rhododendrons were complemented with some beautiful trees, camellias and liliums to mention just a few of the extra plants which made up the beauty of this excellent garden. With the rain still pouring down we travelled on to Brenda and Ian Kibble's garden at Romaine. Once again we were treated to an immaculately kept garden with a diverse range of plants, including Ian's passion, the deciduous azaleas, which gave everyone plenty to admire.

Appetites were whetted as the barbeque smells from the famed Emu Valley Rhododendron Gardens, next-door, wafted through the air. We all devoured numerous sausages and salads before spending the afternoon wandering around the garden observing the progress made since last visit. Many areas have been extended with new plantings, more rock walls being completed, and the pool and surrounds in the Japanese section beginning to look most attractive. The large collection of vireyas amongst the blackwood trees are thriving and were budding up well. Although a little late in the season there were still sufficient rhododendrons flowering to make this a most worthwhile visit. Credit must go to those enthusiastic members who are working so hard to make this a world wide 'must' for rhododendron lovers.

The annual dinner, which included the Annual General Meeting of the Australian Rhododendron Society, was held at the Burnie Civic Centre. The following office bearers of the Society were endorsed by those present for the year 1999–2000.

President:	Neil Jordan Emu Valley Rhododendron Society
Vice-President:	Alan Kerr Grant South Australian Branch
Secretary:	Barry Stagoll Victorian Branch
Treasurer:	Neil Webster Victorian Branch
Technical Officer:	Ken Gillanders Southern Tasmanian Branch
Registrar:	Graeme Eaton Victorian Branch
Librarian:	Valerie Marshall Victorian Branch

Maurie Kupsch entertained us after dinner with the history of the Emu Valley Garden. One never fails to marvel at the ingenuity of some of the members when one hears exploits of how many of the problems in establishing the garden were overcome.

Early Sunday morning, bleary eyed, but enthusiastic, we made our way to Elaine and Sam Biggins garden at Yolla. After walking around and admiring the garden we all agreed that there is always plenty to see at 'Katandra'. Then on we went to the Lapoinya Rhododendron Garden now run by David Olsen and Ruth Easton. Ruth and David are endeavouring to return this garden to that glory which Bob Malone had achieved in its hey day. Although many plants had been sold off, the number of rare species and cultivars which remain ensured that everyone had much to see and admire.

Helen and Mike Dixon at Wynyard were our lunch hosts and they showed us around their mature garden with its many large rhododendrons and camellias. Long time members will remember that Mike was a past secretary of National Council and many of us were pleased to catch up with him again.

From this mature garden we travelled to the young garden of Rod McGlone at Somerset. Rod is so enthusiastic he keeps acquiring parcels of neighbouring property and he is certainly putting together a quality collection of rhododendrons and companion plants. What is equally amazing is that Rod's garden is over the road from the sea but never the less all the plants are thriving.

With reluctance we realized that our weekend of rhododendrons was at an end. These weekends are always happy times when the camaraderie between members from all over Australia reinforces the value of these events. Thanks to Barry Davidson of Southern Tasmania for initially proposing that these weekends be held, and thanks National Council for their endorsement. Here's hoping these events go from strength to strength and that more members support the huge efforts that go into making up the programmes for these weekends.

Lesley Eaton, a past President of the Society, is currently President of the Victorian Branch (second time around in this role) and a Delegate on the National Council.

Thomas Lelliott

Members of the Society, especially those older members involved in its early days, will be saddened by the death of Tom Lelliott, who passed away on 8th June 2000 in his 89th year, five days after developing pneumonia.

It was my privilege to represent the Society at a funeral service held for Tom at the Le Pine Chapel in Hawthorn on 10th June.

Tom was the youngest of seven children. He is survived by two sisters, Dulcie 98 years and Eileen 92 years, together with Eileen's son John and daughter Gwenda.

After the death in 1988 of his beloved wife Dulcie, who he had nursed during her long final illness, Tom lived in a flat in Power Street, Hawthorn for nearly 12 years, then in Hedley Sutton Special Accommodation Hostel and for his last few months in the Preston & District Nursing Home.

Left to right Tom Lelliott (wearing black beret), Michael Black (visiting from UK) Jack O'Shannassy and Bob Withers, in Bob Withers' garden at Olinda, 1969.

Rather than write afresh about Tom's life and his work for the Society, I felt that republication of the following tribute to him, which I wrote for *The Rhodododendron* Vol. 19 No. 2 (June 1980), would serve well to mark his passing. It captures very well the contemporary understanding that he was one of the great influences on the building of our Society, and that he played a most important role in establishing international recognition of Australia's credentials in rhododendron culture and hybridising, especially the culture and hybridising of vireyas.

Tom Lelliott

from *The Rhodododendron* Vol. 19 No. 2 (June 1980)

At its meeting of March 29, 1980, the National Council of the Australian Rhododendron Society unanimously agreed to offer Honorary Membership of the Society to Mr Tom Lelliott in recognition of his service to Horticulture and the genus *Rhododendron* in particular.

Mr Lelliott has graciously accepted.

Although not well known to our newer members, Tom Lelliott was one of our keenest members, one of our most knowledgeable and one of the Society's hardest workers in its earlier years.

A man with a number of interests in his lifetime, he has achieved great success in all of the different fields of endeavour with which he has become associated. Having a keen interest in radio, he trained as a radio technician, then worked at the Australian Broadcasting Commission, for the Post Master General's Department. Subsequently, he manufactured electronic equipment for a private company; but probably his most satisfying occupation was his last, when he worked on the technical staff of the Cyclotron branch of the Department of Physics at Melbourne University, where he became associated with Dr John Rouse.

A keen musician, he at first was a violinist and later played the double bass with Albert Rabaudi in the Melbourne Symphony Orchestra.

Living in a south eastern suburb of Melbourne in the pre-war years, Tom Lelliott commenced his association with horticulture when he became a very successful orchid grower. In the early 1930s orchid culture was very popular and with the importation of fibre from Japan in the late 1930s became very successful.

A little later, Tom bought a block of land at Boronia, Victoria, in the Chandler subdivision, built himself a house and glasshouse and continued growing orchids. It was some years after moving to Boronia that he became acquainted with Alfred Bramley, Foundation President of the Australian Rhododendron Society, and started his interest in rhododendrons, and in the early 1950s commenced to plant his garden with them. Three overseas trips followed during the next 15 years, as a result of which large numbers of cuttings and seed were sent from England to Alf Bramley, of all the best forms of the Rhododendron species and the best of the newer hybrids. It had been arranged that Alf Bramley would organise their reception and propagation. On his return from overseas, Tom Lelliott 'grew on' this material so that when the National Rhododendron Gardens (were) commenced at Olinda, and in the following few years, he was able to supply the Gardens with an innumerable number of select plants.

Tom Lelliott was a member of the Ferny Creek Horticultural Society in the middle 1950s and later became a foundation member of the Australian Rhododendron Society.

In the 1950s he raised some excellent evergreen azaleas. Many have been named but have never been made available commercially.

His first interest in the Malesian Rhododendrons, or Section Vireya, was when he was in England and observed the work being done in this group at Kew Gardens. This interest was greatly increased during the early 1960s when the Society received seed of Malesian species from Canon Cruttwell, and Brian Clancy received seed from Dr Sleumer, after making contact with him during his expedition to West Irian.

Tom's orchid experience proved of great value following this initial introduction of Malesian species. He was able to flower the species and hybridise them faster than anyone else in the world. The late Michael Black, when he visited Melbourne in 1968, said that Tom was "the world's leader in the Malesian field. He had flowered hybrids no one else had, and had worked out some of the dominant and recessive genes so important for future hybridising." He is still breeding Malesian hybrids, many of which are now in their second generation. Some of the best are now becoming available commercially in limited numbers. During the 1960s Tom Lelliott was responsible for an enormous number of small Malesian plants being made available for members. This popularised Malesian Rhododendrons in Victoria, and did much to enable our Society to lead the world in Malesian culture.

During the early years of the Society, Tom served on the Committee for some years. He worked hard staging the Society's exhibit which filled the stage of the Olinda Recreation Hall. He was also active in staging Society displays under the dome of the old Commercial Bank of Australia Building in Collins street, and later Society displays in the State Savings Bank Building at the corner of Bourke and Elizabeth Streets, Melbourne.

For many years he handled all of the Society's overseas correspondence, and in the 1960s became responsible for our Society being the major supplier of Malesian material throughout the world.

In the 1960s Tom Lelliott was a regular contributor to our journal, and he was a lecturer of high repute. His lecture on the systematic botany of the Malesian Rhododendrons, or Section Vireya, given many years ago was a classic. There has never been one better, before or since.

On my recent visit to America, the name of Tom Lelliott was a household word among rhododendron growers. Of the Malesian Rhododendron hybrids I saw, the majority were crosses made by Tom. But for his work, our Society would not have the overseas standing it now enjoys, both in America and in Europe.

To Tom's relatives and friends, members of the Society express their deepest sympathy.

R.M. Withers, June 2000

Noel Sullivan

Noel Sullivan died in Burnie, Tasmania, late in February, only a few months after the death of Mr Bob Malone. The fortunate association of these two keen rhodophiles has made a remarkable impression in the last twenty years on the culture of rhododendrons in Tasmania, particularly in the northwest of the State.

Noel was born in Sydney in 1921, and educated there. During the war years he saw service, first in the Army and later in the Air Force, when he trained as a navigator in Canada. After the war, he studied dentistry and practised in Sydney for some time. During a working holiday in Tasmania, Noel fell in love with the State and decided to stay.

To further develop his keen interest in rhododendrons, Noel became a member of the Australian Rhododendron Society, then based in Melbourne.

Noel Sullivan (centre) pictured the day after one his "triumphs" – delivery of the 1997 Baron Von Meuller Memorial Address in Melbourne, with Victorian members (L to R) Bill Taylor, Vin Hurley, Jack Morris and Gay Stagoll.

Over the ensuing years, increased interest led to the development of three Rhododendron Society Branches in Tasmania. Noel was ideally placed to exert a strong but benign influence on the Northwest Branch's affairs, serving several terms as President or Secretary.

The decision of the Northwest Branch to establish a rhododendron garden in the Emu River Valley gladdened Noel's heart, and he threw his considerable talent and knowledge into the project. This garden, now one of the jewels of the crown in the City of Burnie, owes much to the vision of one man and the influence this had on others. Noel, as the original curator, created, with the help of an endless stream of equally dedicated rhododendron enthusiasts, a unique showcase in which to display a treasure trove of rhododendrons.

Such was Noel's knowledge and reputation in the field of hybridising and rhododendron propagation that he was often commissioned to write articles for specialist rhododendron journals nationally and internationally. He also became a noted speaker on hybridisation on an international level. Noel was honoured with Life Memberships both of the Australian Rhododendron Society and of the governing board of the Emu Valley Rhododendron Society.

He will be greatly missed.

H. O'Rourke, Emu Valley Rhododendron Society, July 2000

Rhododendron 'Triumphans' ...a classic vireya hybrid

Brian Clancy

'Triumphans' is a classic vireya hybrid which has stood the test of time. It was raised by Blys before 1871, awarded the First Class Certificate by the Royal Horticultural Society, London, in 1883 and, rather significantly, added to the International Rhododendron Register by the Regius Keeper, Dr H.R. Fletcher in 1958, some 87 years after its introduction.

'Triumphans' has scarlet-crimson, waxy flowers in compact, formal trusses of 9–15 flowers. It has very showy, long lasting flowers boldly displayed on very good, glossy foliage. It is easy to grow and flower and once established, in pots or in the ground, will bloom for three months.

The genealogy of 'Triumphans' is:

R. brookeanum var. *gracile* × *R. lobbii**
|
'Duchess of Edinburgh' × *R. javanicum*
|
'Triumphans'

The 'Triumphans' in cultivation in Australia (and also in several countries overseas) was originally found by the late Don Stanton of Wollongong, New South Wales, in 1964. When don first visited Olinda in 1962 and again in 1963 he become very enthusiastic about vireya rhododendrons. This prompted him to search for vireyas in New South Wales, and, as result, he heard of a rundown orchid nursery in a country town remote from Sydney. He visited this nursery in 1964 and found a solitary vireya plant. He persuaded the orchid grower to sell him this plant £5 ($10); the same amount for which the orchid grower had paid for the plant in Malaya.

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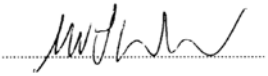
*It should be noted that *R.lobbii* was originally listed in the catalogue of J.Waterer 1870 but was subsequently re-classified as *R. longiflorum* var. *longiflorum*.

The plant purchased in 1964 flowered for Don Stanton in 1965 with a magnificent, formal truss of scarlet crimson flowers. At the time, it was sensational to all privileged to see. In all respects it was identical to a coloured photograph of 'Triumphans' published circa 1880. In his usual generous manner, Don Stanton immediately propagated cuttings of 'Triumphans' which he distributed freely throughout Australia. He also sent scions of 'Triumphans' to USA, England, New Zealand and Japan. Subsequently, 'Triumphans' was reproduced in colour in the Japanese Rhododendron Society's Handbook and also in leading nurseryman K. Wada's Handbook No.9.

'Triumphans' is a classic vireya hybrid that has stood the test of time and will be around for a very long time.

Report by the Treasurer

I Neil Gordon Webster, the Treasurer of The Australian Rhododendron Society Incorporated, do hereby state on behalf of the Society, that the accompanying financial statements present fairly the position of The Australian Rhododendron Society Incorporated as at 30th June 2000 and the results of its operations for the year ended 30th June 2000.



Neil Gordon Webster.

Dated at Melbourne this Twenty First (21st) day of August 2000.

Balance Sheet as at 30 June 2000

	1998-1999 $		1999-2000 $	
Current Assets				
Cash				
ANZ (Current A/C)	6059.70		6879.70	
Macquarie Bank (on-call Invest)	9014.65		9383.17	
Secretary's Advance	200.00		200.00	
		15274.35		16462.87
Book Stock (at valuation)		1452.00		1452.00
Total Current Assets		16726.35		17914.87
Non-Current Assets				
Library Note 7		2000.00		2000.00
Total Non-Current Assets		2000.00		2000.00
TOTAL ASSETS		18726.35		19914.87
Current Liabilities				
Accrued Expenses				
Teleconference	351.60		270.20	
Secretary expenses	46.60		0.00	
Audit Fees	250.00		300.00	
		648.20		570.20
Total Current Liabilities		648.20		570.20
NET ASSETS		18078.15		19344.67
ACCUMULATED FUNDS				
Balance at the beginning of the financial year		16679.60		18078.15
Increase in net Assets resulting from operations		1398.55		1266.52
Balance as at the end of Financial Year		18078.15		19344.67

Statement of Income & Expenditure as at 30 June 2000

	1998-1999 $	1999-2000 $	
INCOME			
Membership Subscriptions Note 8	6609.00	5670.00	
Advertising	309.00		375.00
Book Sales	396.00		0.00
Bank Interest	333.93	398.81	
Other	37.70		0.00
Total Income	7685.63		6443.81

EXPENDITURE		
National Journal The Rhododendron	4051.00	3135.00
Travel Subsidies	611.86	904.73
Bank Charges	15.09	10.17
Secretary Expenses	378.03	349.19
Advertising	0.00	152.00
Cost of Book Sales	396.00	0.00
Telephone Conference	351.60	270.20
Book Sales (refund)	120.00	0.00
Library (Bind Journals)	78.50	0.00
Audit Fee	250.00	356.00
Miscellaneous (Audit Certificates)	35.00	0.00
Total Expenditure	6287.08	5177.29
Surplus for the year.	1398.55	1266.52

Statement of Cash Flows as at 30 June 2000

	1998-1999		1999-2000	
Cash Flows from Operating Activities.				
Receipts				
Membership Subscriptions Note 8	6609.00		5670.00	
Advertising	309.00		375.00	
Book Sales	396.00		0.00	
Bank Interest	333.93		398.81	
Other	37.70		0.00	
		7685.63		6443.81
Payments				
National Journal The Rhododendron	4051.00		3135.00	
Travel Subsidies	611.86		904.73	
Bank Charges	15.09		10.17	
Secretary Expenses	421.61		395.79	
Advertising	0.00		152.00	
Telephone Conference	579.00		351.60	
Library	78.50		0.00	
Book Sales (Refund prev. year)	120.00		0.00	
Audit Fee	250.00		306.00	
Miscellaneous (Audit Certificates)	35.00		0.00	
	6162.81		5255.29	
Net Cash Inflow from Operating Activities		1522.82		1188.52
Cash at the Beginning of the Financial Year		13751.53		15274.35
Cash at the end of the Financial Year		15274.35		16462.87
Represented by:				
Current Account (ANZ Bank)	6059.70		6879.70	
Less Unpresented Cheque	0.00	6059.70	0.00	6879.70
Macquarie Investment (On-call)		9014.65		9383.17
Secretary Advance		200.00		200.00
Treasurer Advance		0.00		0.00
Total		15274.35		16462.87

Notes to and forming part of the Financial Statements
for the year ending 30th June 2000

Note 1. Summary of significant accounting policies.
Basis of Accounting.
This general purpose financial report has been drawn up in accordance with the requirements of the Associations Incorporation Act 1985 (South Australia) and the Rules of the Society.
The financial report has been prepared in accordance with applicable Australian Accounting Standards and other mandatory professional reporting requirements (Urgent Issues Group Consensus Views).
It has been prepared on the accrual basis under the convention of historical cost accounting, with the exception of certain non current assets which are at valuations determined by the society's National Council.
Additionally, interest is accounted for when received.

Note 2. Increment/Decrement in General Funds.
The increment/decrement for the year is arrived at after bringing into account all revenue and expenditure, but excludes all capital expenditure on fixed assets.
The balance of membership funds is invested in either interest bearing deposits with Macquarie Bank or with the ANZ Bank.

Note 3. Comparative figures.
Where necessary, amounts shown for the previous year are in accordance with the same classifications as used for the current year.

Note 6. General.
There are no contingent liabilities.
There were no commitments for capital spending or lease payments as at 30 June 2000.
No such commitments exist at the date of this report.

Note 7. The library.
Total value as at 30 June 2000 $2000.00.
The book stock is held as part of the library located at Olinda Victoria and is managed by ARS Victorian Branch.

Note 8. Membership Subscriptions.
The rate per head for subscription levy is as follows:
Year 1999-2000, $15.00 per head.
For the year 2000-2001, the rate will be $15.00 per head.

Note 9. Related Parties.
Officers and Delegates of the National Council of the Australian Rhododendron Society Incorporated, are not entitled to receive any benefit or remuneration for their services as Officers or Delegates, apart from reimbursement of a portion of travel expenses properly incurred, in accordance with the Act under which the ARS Inc is incorporated.

Note 11. Reconciliation of decrease in Net Assets Resulting from Operations to Net Cash Inflow from Operating Activities.

Increase in Net Assets from Operations.	1266.52
Change in operating assets and liabilities.	
Decrease in Accrued Expenses	-78.00
Net Cash inflow from Operating Activites	1188.52

Note 12. Financial Instruments as at 30 June 2000.
a) Terms, Conditions and Accounting Policies
The Society's accounting policies including the terms and conditions of each class of financial asset and liability at balance date are as follows

Recognised Financial instruments	Accounting Policies	Terms and Conditions
(i) Financial Assets.		
Cash	Cash deposits are stated at net realisable value. Interest is recognised in the Statement of Income and Expenditure when received	Cash is available on call and the interest rates at 30 June 2000 were ANZ – 0.00 to 0.05% Macquarie Bank – 3.97%.
(ii) Financial Liabilities.		
Accrued Expenses	Accrued Expenses are stated at nominal amount	Accrued expenses are unsecured and not subject to interest charges

b) Interest Rate Risk
The Society's exposure to interest rate risks and the effective interest rates of assets and financial liabilities are as follows:

Financial Instrument	Floating interest Rate	Non Interest Bearing	Carrying Amount	Weighted Average Interest Rate
(i) Financial Assets.				
Cash ANZ	$6,879.70		$6,879.70	0%
Cash Macquarie	$9,383.17		$9,383.17	3.97%
Secretary's Advance		$200.00	$200.00	0%

Financial Instrument	Floating interest Rate	Non Interest Bearing	Carrying Amount	Weighted Average Interest Rate
(ii) Financial Liabilities.				
Accrued Expenses		$570.20	$570.20	

c) Net Fair Value
The net fair value of a financial asset or a financial liability is the amount at which the asset could be exchanged or liability settled in a current transaction between willing parties. The aggregate net fair values of financial assets and liabilities as at balance date are as follows:

Financial Instrument	Carrying Amount	Net Fair Value
(i) Financial Assets		
Cash	$16,462.87	$16,462.87
(ii) Financial Liabilities.		
Accrued Expenses	$570.20	$570.20

For Cash and Accrued Expenses – the carrying amount approximates fair value because of the short term to maturity.

Comparative information relating to 1998–1999 is available from the Annual Report as at 30 June 1999, published in The Rhododendron Volume 39.

AUDIT REPORT TO THE MEMBERS OF THE AUSTRALIAN RHODODENDRON SOCIETY INC.

Scope
I have audited the financial statements of the Australian Rhododendron Society Inc., for the year ended 30th June 2000 comprising Statement of Income and Expenditure, Balance Sheet, Statement of Cash Flows, and notes to and forming part of the financial statements. The National Council is responsible for the preparation and presentation of the financial statements and the information contained therein. I have conducted an independent audit of the financial statements in order to express an opinion on them to the members of the Australian Rhododendron Society Inc..

My audit has been conducted in accordance with Australian Auditing Standards to provide reasonable assurance as to whether the financial statements are free of material misstatement. My procedures included examination, on a test basis, of evidence supporting the amounts and other disclosures in the financial statements, and the evaluation of accounting policies and significant accounting estimates. These procedures have been undertaken to form an opinion as to whether, in all material respects, the financial statements are presented fairly in accordance with Australian Accounting Standards and other mandatory professional reporting requirements (Urgent Issues Group Consensus Views) so as to present a view which is consistent with my understanding of the Society's financial position, the results of its operations and its cash flows.

As an audit procedure, it is not practicable to extend my examination of income beyond the accounting for amounts received and recorded in the books and records of the Australian Rhododendron Society Inc., and representations have also been received from National Council in relation to the carrying values of the book stocks and library.

The financial statement audit opinion expressed in this report has been formed on the above basis.

Audit Opinion
In my opinion, subject to the above, the financial statements present fairly in accordance with applicable Accounting Standards and other mandatory professional reporting requirements, the Associations Incorporation Act 1985 (South Australia), and the Rules of the Society, the financial position of the Australian Rhododendron Society Inc., as at 30th June 2000, and the results of its operations and its cash flows for the year ended 30th June 2000.

R. J. FOWLER & ASSOCIATES, FIMA, ACIS, MNIA
19th August 2000

THE SPRING 2001 ARS ANNUAL WEEKEND EVENT

The Society's next national **Annual Weekend Event** will be hosted by the South Australian Branch, and will be held in the **Adelaide Hills** area of South Australia over the weekend of **12th and 13th October 2001**.

Why not put these dates in your diary now? ..... and plan to enjoy the hospitality of our South Australian members in the company of other rhododendron enthusiasts from many parts, complete with a number of visits to very fine gardens (including the Mt. Lofty Botanic Gardens) and a sampling of the many tourism delights of the Adelaide Hills.

Branch Newsletters (and the ARS website at www.eisa.net.au/~mirra) will carry details of the event and the booking arrangements nearer the time.

When visiting Tasmania

Don't miss ...

Emu Valley Rhododendron Garden

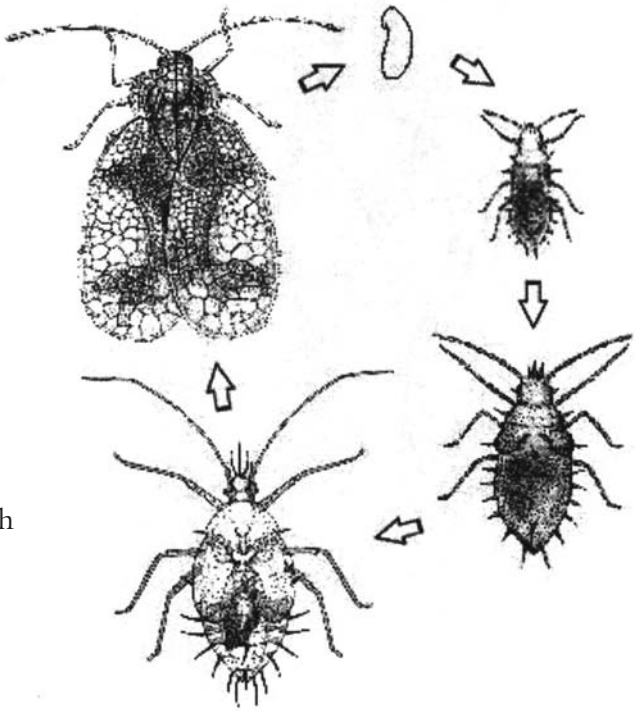
13ha of the finest rhododendrons and select companion plants from around the globe!

Open to the public from 10 a.m. to 5 p.m. every day (except chrismas Day) from August 1 to end February.

Peak flowering - early October to mid November.

From Burnie - Travel south on Mount Road towards Ridgley for approximately 6 km. Turn left at Cascade Road. Follow the signs into the garden.

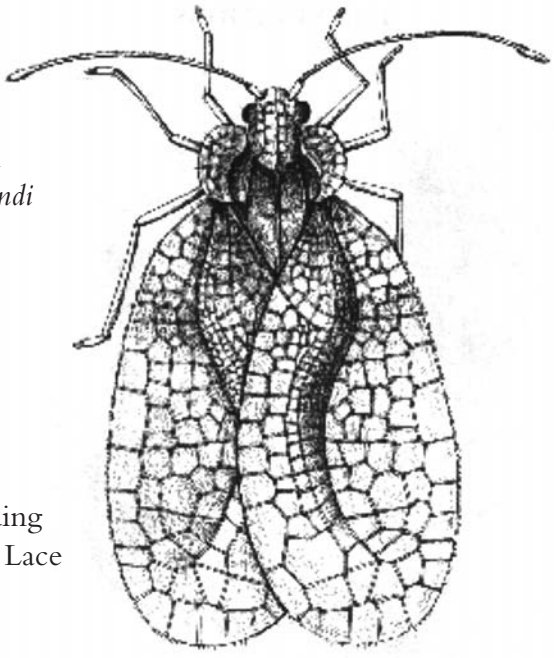
PO Box 39, Burnie, Tas 7320 Tel:(03) 6435 1298 or (03) 6435 7364



Life cycle of the azalea lace bug, *Stephanitis pyrioides* (Scott), Tingidae, HEMIPTERA.

Clockwise from the top, the stages are:

- egg
- first-stage nymph
- second-stage nymph
- third-stage nymph
- adult



Adult of the rhododendron lace bug, *Stephanitis rhododendi* (Horvath), Tingidaw, HEMIPTERA.

Illustrations for Understanding the Enemy – Demystifying Lace Bugs by Rod Capon.
See page 21.