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## *Editorial* — Manfred Wagner, Convenor - Publishing Committee

PLEASE HELP! We are desperately short of articles and related drawings/ photographs. We try to cater for a range of interests - from beginner to advanced. If you have a specific interest, then chances are that others of the same interest would be delighted to read about your experiences. (Submission details for articles/images can be found on the inside back cover.)

Ongoing change in the naming of plants is part of the botanical landscape. Just when you think you have a family or genus sorted out in your head, somebody comes along and reclassifies it. I expect the rate of name changes will continue to be high - until the 'tree of life' has been fully mapped, which is unlikely in my lifetime, or reduced funding reduces the amount of research undertaken. In 2007 there were circa 2,700 changes to Australian plant names - an average of 7.3 changes each day! Our understanding of plants and their place in the evolutionary tree continues to increase. Possibly the major factor for this has been the, relatively recent, availability of DNA analysis tools.

When Tony Cavanagh and Margaret Pieroni published their wonderful book *The Dryandras* in 2006 (p. 147), they were not to know that *Dryandra* would be merged into *Banksia* by Thiele and Mast in 2007 (p. 178). Due to the merge all *Dryandra* names changed, with Tony less-than-happy about the whole situation.

This publication endeavours to keep up with, hence use, the latest names. That said, I expect many others will continue to use *Dryandra* for some time to come, as it is valid to continue to use a plant's previous name.

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**Front cover:** *Eremophila fasciata* - photo: Manfred Wagner
**Rear cover:** *Banksia ashbyi* - photo: Chris Nayda
Photos taken at the Australian Arid Lands Botanic Garden, Pt Augusta SA.


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# So You Want to Write a Book

- The inside story of the writing of *The Dryandras* _____ Tony Cavanagh

**Introduction**

Margaret Pieroni and I on behalf of the Dryandra Study Group recently published a book on the genus *Dryandra*, appropriately called *The Dryandras*. Cas Lieber asked if I could write an article on how the book came into being, especially as I at least was a first-time author, although Margaret has produced one book of her own (*Discovering the wildflowers of western Australia*) and was the artist for the highly acclaimed *Verticordia the turner of hearts*. Writing the book was a fascinating and at times stressful experience but we are both very happy with the result and hope that you also enjoy it. We tried to achieve a balance between scientific accuracy and detail and practical horticultural and gardening information so that both scientist and lay person can learn about the fascinating genus *Dryandra*. We also saw it as following the aims of the pioneers of growing Australian plants in making available information on the cultivation of our wonderful flora.

I'll give you a brief historical background to see how I became involved with the book and then I'll discuss the barriers to getting a book published. These are mainly: (a) finding a publisher and (b) covering the costs. Then I'll describe how we went about the writing and setting up the book for printing and then the most complex step of all, the actual book publishing process. I might say at this stage that by far the easiest stage was the actual writing - this was so straightforward compared with the other steps! Lastly, I will include some pictures of dryandras which have flowered for me, mainly in 2006, just to give you an idea of their variability and why they have intrigued my co-author Margaret and I for so long, and a sample page and drawing from the book.

Margaret has written a personal account of her involvement with Dryandras and the book from the early 1980s, which was published in our Study Group newsletter for February 2007. In this she tells of the discovery of a number of species (she has collected the type specimens for around 8 *Dryandra* taxa) but these are just a few of her adventures as she has seen and photographed every *Dryandra* taxon in the field - as she says, almost every *Dryandra* has a personal story behind it. In this article, I have concentrated on the publishing process as this is rarely discussed - the story of the discovery of many species and the difficulties of obtaining suitable photographs for all taxa could well fill another article.

**Brief historical background**

The Society for Growing Australian Plants was founded in Victoria in March 1957 by A.J. Swaby who was a teacher with a passionate interest in native plants – he wrote many articles for the gardening magazine *Your Garden* under the heading of "Know your natives". One of Swarby's aims was to set up "study groups" of enthusiastic amateurs who would experiment with groups of plants, Banksias, Boronias, Grevilleas etc, and report their results through the Society's magazine. I discovered a few years back that there was even a Dryandra Study Group in 1962 but we know nothing about any of its work.



*Dryandra baxteri* (now *Banksia biterax*). Not commonly grown, this medium bushy shrub from the Stirling Range through to Albany with another population near Busselton is hardy and long-lived. It has probably the softest foliage of all dryandras and flowers profusely although the individual flower heads are about the size of a twenty-cent piece.

All photos (both pages) M Pieroni



*Dryandra nivea* subsp. *nivea* (now *Banksia nivea* subsp. *nivea*). The common name for this species, 'honeypots', refers to the pot-like appearance of the flower heads which contain nectar at their base. They are almost certainly pollinated by small marsupials. The species is very widespread in WA, from north of Eneabba to near Israelite Bay, and is hardy in cultivation where it grows to around 50 cm high in sun or light shade, often with attractive blue-green foliage.



*Dryandra nobilis* subsp. *nobilis* (now *Banksia nobilis* subsp. *nobilis*). Closely related to *D. formosa* (now *B. formosa*) and *D. stuposa* (now *B. stuposa*), this species lives up to its name, often with hundreds of golden yellow flower heads along its many branches. It can be a large shrub to 3–4 m with similar spread but in cultivation, is often smaller. It prefers gravely, well-drained, heavy soils rather than sand in near full sun and withstands long periods of dryness.



*Dryandra praemorsa* var. *splendens* (now *Banksia undata* var. *splendens*). The plant shown here with attendant bee, is the less common pink form. It has larger flower heads and leaves than the widely grown var. *praemorsa* and can reach 2–3 m in a garden. It is found naturally in gravely soils in the Jarrah-Marri forest inland of Perth and in cultivation can withstand moderate shade. It flowers in less than 18 months from seed.



*Dryandra quercifolia* (now *Banksia quercifolia*). Commonly seen along the south coast and inland, from the Gairdner River to Middle Mount Barren. *D. quercifolia* is very popular as a cut flower and is long lasting when picked at the bud stage, as shown here. In cultivation, it grows to 2–3 m although it can become leggy in shade situations. It prefers deep sand or deep well-drained loam and flowers in around two years from seed. It is also relatively easy to propagate from cuttings taken in autumn.

*Dryandra brownii* (now *Banksia brunnea*). This species is relatively well known in cultivation (also incorrectly known as *D. arctotidis*). It is found naturally along the south coast from the Stirling Range National Park to the Fitzgerald River National Park. In cultivation, it is sometimes a shy flowerer but is outstanding as a lovely foliage plant, forming a bushy spreading shrub up to 70 cm high.





*Dryandra anatona* (now *Banksia anatona*). This is a gazetted rare plant from the Stirling Range where fires and the disease *Phytophthora cinnamomi* have drastically reduced its numbers. It is difficult to keep alive in the garden but suits a large pot in a sunny position. It is one *Dryandra* that strikes well from cuttings taken in May.

I joined SGAP in the early 1970s and was intrigued with Kangaroo Paws and Banksias, especially Western Australian Banksias, and began to grow them, often with not much success. In reading the minimal material written about native plants, I came across a group of plants known as *Dryandra* which seemed to be closely related to the Western Australian Banksias but nobody could tell me anything about them. I was at a meeting of the Victorian SGAP in 1974 and met the Leader of the Wangaratta Group of the Society, Bruce MacDonald, and we got to talking about growing natives. He also knew nothing about Dryandras but said, "Why don't you form a Study Group". So that's what happened and the Dryandra Study Group is probably just about the oldest continuing Study Group in the Society.

In the early days, we had no Western Australian members, something of a problem when their natural distribution is confined to Western Australia, but eventually Margaret Pieroni and some other WA people joined and a Victorian member, Keith Alcock, made several major expeditions to WA in the 1980s to collect specimens and seed to build up our knowledge of the group. We began to think seriously about writing a book in 1996 after the Western Australian botanist Alex George revised the group and began writing in earnest in about 2001 after he had published a complete revision for the *Flora of Australia* project. Alex was extremely generous with his knowledge and in allowing us to use his botanical descriptions. Likewise, The Australian Biological Resources Study readily made available the botanical keys we used - without such support, this book would not have happened. Nevertheless, we are not the fastest of writers as it has only taken us about five years to complete but as you will see, getting a book published can be a real challenge.

**Barriers to getting a book published**

It is easiest to talk about barriers or as others would prefer, challenges, under two headings:

1. Finding someone who will publish your book, and/or finding the money to cover the costs, and
2. The actual expenses of publishing.

**1 – Who wants the privilege of publishing my book?**

I have to say I was pretty naïve when I set out to find a publisher and thought that because no one had published a book on Dryandras before, publishers would be delighted to have the opportunity to handle our book. I completely forgot about the fact that in publishing, I was a complete novice and a virtual unknown. Also, not many native plant growers knew much about Dryandras so why would publishers know any more? I very quickly learned that the market for specialist books such as ours was extremely limited and most commercial publishers had no interest at all - the print runs would be too small to make any money. Eventually, I spoke with Warwick Forge from the specialist publishing and book distribution firm Bloomings Books who specialise in horticultural and natural history books. He would consider it if I could obtain funding from 'wherever' and gave me a very rough draft budget based on my estimates of the size of the book, number of pages, number of illustrations etc which came to something around $30,000.00. Welcome to the real world!

I should also mention that at an early stage in our discussions, Warwick Forge suggested that the most economical way to produce the book was for the APS to

publish the book and for him, in this case, to merely act as the consultant or 'packager' (to use the jargon). He pointed out that for a book like this, which would have limited specialist sales, any publisher would demand a heavy subsidy in order to cover the apparent risk and to earn an adequate profit (as we had already found). However, the limited specialist market available was also a predictable market (ASGAP members) which the various ASGAP groups throughout Australia had ready access to. He believed that the book would be viable if published by 'us' since:

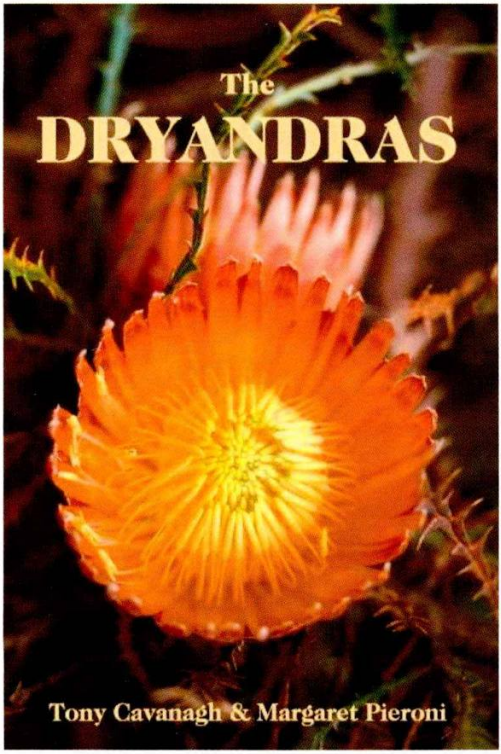
- The Society would be selling much of the stock directly to its own members thus avoiding expensive distribution channels and middlemen;
- Instead of having to heavily fund a publisher, the Society was making the investment and capturing the bulk of the sales and profits directly itself;
- The Society and its members would gain a sense of ownership, thus motivating members to buy the book which is itself promoting one of the Society's major aims, the publication of information about our Australian plants.

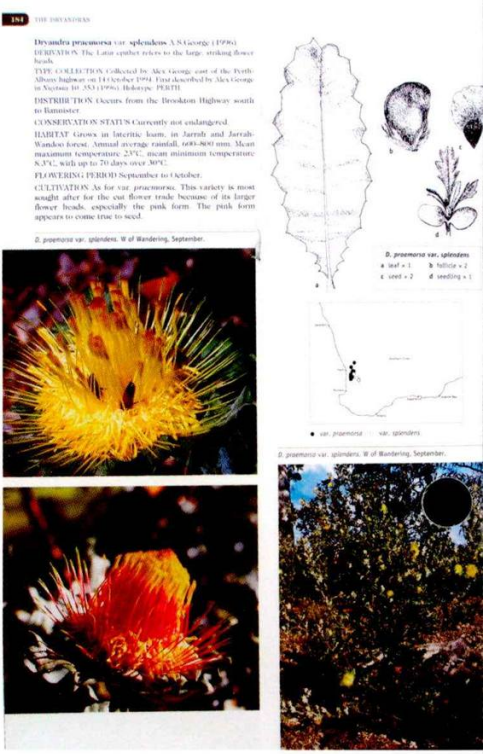
If this venture was successful, it might set a precedent and become a model for similar publications in the future.

After discussion with Neil Marriott who was then its President, and later with Paul Kennedy, APS Victoria offered a loan of $10,000 to be paid back from sales of the book, on the condition that the Western Australian Wildflower Society at least matched it - in fact, they loaned us $15,000. A circular was also sent to Victorian APS groups inviting them to contribute. This brought in another $3,000, including a $2,000 donation from APS Geelong, and I have also contributed some funding. Warwick Forge was to act as our publishing consultant and Bloomings Books were to have distribution rights to the book-trade, with the Society selling to ASGAP members. Unfortunately, as is often the case, some of the original estimates were too low and the eventual costs somewhat exceeded $30,000, so we just need to hope that we can sell most of the final print run of 1,000 copies to cover our costs.

**2 – How much does it cost to produce a book?**

The general public is often surprised by the apparent expense of books, especially glossy hardcover ones with lots of pretty pictures. The more specialised the book, the smaller is the likely print run (it is unlikely to have a big audience) so that a publisher needs to charge a lot per book to recover their costs. And they are very expensive to produce. One well-known Australian plant book cost over $100,000 before a copy was sold and figures of $40,000 to $60,000 are not uncommon for many hardcover books. As we will see in the next section, a lot of the expense results from the cost of scanning images, layout and design, perhaps use of a specialist photographer, specialist editors and of course the preparation for printing and the actual printing. The list of credits in books can give you an idea of where some of the money goes. For example, Diana Snape's book *The Australian Garden*, had a designer, two (text and layout) editors, a botanical editor, an indexer, a specialist photographer and the publisher who co-ordinates it all together. All these people need to be paid and it all adds to the expense. Even a relatively cheap soft covered book such as Ivan Holliday's *Hakea a field and garden guide*, which sells for around $30 had a project editor, an editor, a designer, a production manager and a publisher.




Front cover, sample page and a sample of th drawings by Margaret Pieroni from the book

This book is the first definitive guide to all 135 *Dryandra* taxa and the first to provide comprehensive information on growing them as garden plants. Dryandras are noted for their attractive and diverse foliage, striking flower heads and unusual habit and growth forms. Many are especially suitable for dry-country gardens.



*The Dryandras* contains over 320 superb colour photographs including, for each taxa, the flower head and the plant in entirety. There are black and white illustrations of a leaf, seed capsule, seed and seedling, and a locality map, all of which are drawn by Margaret Pieroni. Four introductory chapters cover history, biology and ecology, cultivation and propagation. A botanical key and an illustrated glossary of botanical terms are included, and tables will assist in choosing dryandras for different garden situations.

"Information is presented in a very readable format and is complemented by lovely and accurate botanical illustrations as well as a large number of informative colour photographs. This book will be of value to professionals in the fields of botany and horticulture as well as enthusiasts who are eager to learn more": Rodger Elliot - AM.

The authors have had a long association with Australian plants: Tony Cavanagh founded the Dryandra Study Group in 1974 and has grown and observed over 50 species of *Dryandra* in his garden in Ocean Grove, Victoria. Margaret Pieroni combines a love of Australian plants with great skill as a botanical artist. In more than 20 years of travelling over Western Australia, she has studied and photographed all *Dryandra* species and cultivated over 70 species in her garden in suburban Perth.

We really ran on a shoestring and did most of these tasks ourselves, which was very risky as it can so easily go wrong. However, I was extremely fortunate in that my co-author was a graphic designer and botanical artist, who could do the layout and conceptual design. In addition, the 'formatter', who did the layout design and organised it for printing, had 27 years experience in the business and was able to produce the book you see.

**Getting from a manuscript to a digital item ready for printing**

These days, everything finishes up as digital images on a CD or DVD so it is helpful to know a little about computers, pdf files and other things when writing a book. Also, all layout designers and scanning operators use MAC computers but this is not a major problem for Windows users as conversion programs can quickly change a Word document into something a MAC can process. More books these days are produced using digital images from digital cameras but the illustrations for many still come from colour slides or less satisfactorily, from colour prints, and these must be converted to a digital form to be inserted into the text of the book. The same applies to line drawings and black and white illustrations. So the writing, while important, is only part of the story. At a very early stage, you need to decide what illustrations you will use and approximately where you want them placed in the text.

The designer or formatter then has the responsibility of working with the text and illustrations to fit them properly on each page so as not to waste space and keep the number of pages down. More importantly, they need to ensure that the book looks good aesthetically, is clear to read with good typography and is generally well laid out. After the pages are completed, they are sent to the author as 'page proofs' and it is the author's job to make corrections and/or query changes, perhaps even make suggestions. Pages can go back and forth several times until they reach the 'final proof' stage and are ready to be printed as digital proofs for final checking.

A book such as ours with many illustrations is a real test for authors, and organising the illustrations for printing is an expensive part of the process. All the images need to be scanned to convert them to digital form. Each colour scan costs between $10 and up to $25 or more for large images such as are used for the cover. Slides are removed from their mounts and processed on a rotary drum scanner, which costs several hundred thousand dollars but gives the best quality. Black and white images are scanned on flat bed scanners and cost around $5 to $8 per scan. The overall cost of scanning for the book was nearly $6,000.

The scanning company staff are not interested in the fact that you have taken a beautiful picture of *Dryandra nobilis* - to them it is just another picture! They have, say, 320 to scan and each needs to be coded with a simple letter/number code, which they include in the scanned image. The author needs to produce an index of the code numbers and their identification, which must go to the designer/formatter so they can place the pictures in the correct location in the text. And of course, each picture must be captioned, so another set of indexes of captions is required for the layout. As you will see in the book, we had about 200 'blocks' of black and white line drawings of leaves, seed capsules, seeds and seedlings, as well as locality maps for each taxon and these all had to be fitted in to the available space. It would have been a huge task for a graphic designer

starting from scratch to do the necessary layout (and very expensive too, since a qualified book designer starts at about $10,000 for a large book and the price rapidly escalates for a complex work such as ours). Fortunately, Margaret was able to provide a template for all the species (about 70% of the book) which our formatter was able to use although I had to paste all the individual components of leaves, seeds etc into the blocks for scanning beforehand.

It was only when we got back the first proof pages where our text was married up with the illustrations that I realised that we still had a long way to go. Some images had been scanned upside-down, some back to front, some images had been missed all together and we had trouble with the scale of the maps - some of which differed in size - welcome to the real world! We found typos, mistakes and other things we had previously missed. Then we suddenly realised that we had not given the designer any instructions about the format of the captions for the species pictures. For example: should they be above or below each picture, where should the full stops be, should we bleed the pictures off the page and a whole host of other queries. Our designer was very forgiving and I felt a little better when she said that some books came back half a dozen times before they were 'right'. Following up on problems was the biggest bane of our lives, especially as the designer had several other jobs including magazines that had to be out by deadlines and our stuff was pushed back in the queue. Of course, we had the added disadvantage of separation and I couldn't just drop around to Margaret to discuss things – everything had to go back and forth across to WA and that added to costs and delays.

We also had to decide on illustrations for front and rear jacket covers, a very important feature as a good cover can make all the difference between a person at least picking a book up and looking through it, or ignoring it. Our publishing consultant wanted a different picture to the one we chose but all comments we have received indicate that our choice is very striking and 'attention grabbing'. We also needed to make decisions about the frontispiece and do an index and a bibliography and find someone who was happy to write the foreword, a job that Rodger Elliot graciously did. Eventually after about four drafts and corrections, we felt we were ready for the next big, expensive step, the production of digital proofs which for the first time showed us what the book pages might be like and gave us the final opportunity to correct images for colour problems etc. It is a very big and expensive no-no to want to change the text at this stage so you need to be sure that everything is okay before committing to it.

**The book production process**

The hopefully fully corrected book is supplied as a DVD to the scanning company who then produce what are called digital proofs. These are large, thick plastic pages, bigger than A3, which contain double page spreads from the book and cost between $10 and $20 per A4 page! They are printed on a special printer and their prime aim is to show how the illustrations (especially colour) and text will appear in the printed book. Colour corrections can be made at this stage and minor text alterations but it is desirable to keep them to a minimum as any redone page costs another $10 to $20! It is thus important that authors thoroughly check the final proofs supplied by the designer/formatter and give instructions for any changes to the scanning staff who will make alterations **before** producing the expensive digital proofs. The digital proofs for the book weighed about 50 kg and cost a fortune to send to and from WA, as they had to

go via courier. It was just as well that they were sent! Margaret found several images still upside-down, or back to front, a few needed colour correction and there were a few other annoying features but nothing major and we began to breathe easier and think that this book might be a reality after all. The digital proof of the jacket cover especially looked great. Finally, on June 29, the digital proof sheets and the entire book in DVD format arrived at the printers in Hong Kong and we settled down to wait, knowing that it would take another 6–8 weeks before advance copies of the printed book would be available.

There are several steps involved in the printing process, mostly required by the printer who must have the author's or publisher's sign off on the important stages, essentially to prevent authors coming back later and complaining about perceived problems, e.g. colour of end-papers. The parts that are printed (from the outside inwards) are the jacket, the cover and then the text in what are called 'sections' of 16 pages. The jacket also has flaps, which generally have the 'blurb' about the book's contents and information about the author(s). This is in heavy matt art paper and is an important sales feature. The cover or case is in heavy card and a printed page identical with the jacket except for the flaps is laminated to it. Although not a recent innovation, it is important as jackets can be damaged and even when they are removed, the printed cover still has the jacket illustration.

The first printed documents received from the printer are called 'ozalids' (or 'blueprints'), which are like a faded mono-colour version of the printed book, done up in 16 page lots. These are purely for checking that all pages are present and in their correct sequence and no other alterations are able to be made. Then comes the "F's and G's" ('folded and gathered') which are the printed book in the sets of 16 pages along with the jacket and cover, and for the first time, you see what the book will actually look like. Once that is approved, the printer prints the book, which takes approximately two weeks for our sort of book. Printing costs around $15 to $20 or more per book but when we added up all of the other expenses (design, scanning and all the other incidental expenses), the unit cost per book was over $32 each for the 1,000 copies. And this costing takes no account of the thousands of hours of research, travel, etc., that Margaret and I put in. In the end, it was all worth it and we feel that we have a quality book with a comprehensive coverage of another genus of Australian plants.

Would I do it again? I'm not sure but I know many things now that I didn't know before so perhaps the next time might be easier. Certainly, you need to be well organised to ensure the smooth flow of work and you need to try to plan ahead and be clear about what you want to achieve with your book (within the constraints of your budget of course). And if you want to produce a quality book, it starts right at the beginning with high quality slides/pictures and black and white illustrations, top quality scanning and layout design and, probably most importantly, excellent printing on good quality paper. Then you will have something you can be proud of!

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Special price for ASGAP members - $64.00 plus postage - available from:
APS Victoria Book Sales, 13 Conos Crt, DONVALE, VIC 3111 - phone: (03) 9872 3583.
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Sybil Speak, 167 Perry Lakes Drv, FLOREAT, WA 6014 - phone: (08)9367 8414.

# Weindorfer of Cradle Mountain

Dick Burns

Cradle Mountain is an essential component of any visit to Tasmania for those interested in the flora or natural environment. Cradle is always a requested part of the itinerary of both amateur and professional botanists. All who visit the Cradle area owe a great debt to one man.

Gustav Weindorfer, an Austrian by birth, devoted the latter part of his life to the permanent reservation of Cradle Mountain and its surrounds. He was the first to set up the facilities and the tracks to allow people to appreciate and enjoy its beauty and wonder.

Gustav first entered Cradle Valley in January 1909, one hundred years ago.

His introduction to the area came about through an interest in field botany. This article will focus on those botanical influences.

**His life**

The life of Weindorfer, his struggles, hardships, sadness and more importantly, his joys and achievements are well described in two biographies, Giordano's *A Man and a Mountain*[1] and Bergman's *Gustav Weindorfer of Cradle Mountain*[2]. Unless otherwise indicated, biographical information comes from the first book.

Gustav was born in 1874 in Carinthia, a mountainous province of Austria. By 1900, he was discontented with his lot and decided to emigrate. He had chosen Sydney as his first main port of call, but was sufficiently impressed with the liveliness of 1900 Melbourne to stop there.

Weindorfer had done some botanical study in Austria. An article published in a 1901 German newspaper showed his 'rare facility for observation of nature'[2]. Within a year of his arrival in Victoria, he was thoroughly immersed in the local bushland and flora. In August 1901, he was introduced to Mr J G Lühmann, Government Botanist and in charge of Melbourne's National Herbarium. Mr Lühmann had also been a co-founder of the Victorian Field Naturalists' Club and he encouraged Gustav to join. The next month, on 9th September, Gustav was proposed as a member of the Field Naturalists' Club, and the next weekend he went on his first excursion. This was, he noted in his diary, the chance to "Start with the herbarium of Australian plants"[2].

From then on Weindorfer was a committed member of the Club, rarely missing a meeting or excursion. Both his biographers refer to his lack of ability with English but in his obituary written for the Naturalists' Club magazine, Dr Charles Sutton states "A good linguist, he [Weindorfer] already spoke our tongue fairly well, but further to improve it, he regularly attended the Wesley Church" where the rector had notably excellent diction[3]. He quickly became sufficiently proficient in English so that in 1902, he judged the herbariums at a girls' school, presented talks at Club meetings and wrote papers for the Club magazine *The Victorian Naturalist*. Volume 19 of the magazine contains a list (p6) prepared by Weindorfer of algae found on a

campout to Shoreham and Western Port, as well as a paper by G Weindorfer 'on the Fertilisation of Phanerogams' [flowering plants and conifers] (pp98–101). The latter had been first presented as a talk to the Club on 13th October, 1902.

Subsequent entries include other excursion plant lists and papers on alpine flora such as 'Some Comparison of the Alpine Flora of Australia and Europe' (vol 20 pp 64–70).

In March 1903 Weindorfer was honoured with membership of the Royal Geographic Society of Australia.

**Dr Charles Sutton**

Dr Sutton, a doctor of medicine and a member of the Victorian Field Naturalists' Club, took Weindorfer on a trip to the Victorian Alps around Christmas 1902. During the 1903 Christmas period, they went to the Grampians. Both trips resulted in reports in *The Victorian Naturalist*.

A strong lifelong friendship resulted. It has to be assumed that Dr Sutton was a major mentor of Gustav's knowledge of the Victorian flora. The mentoring continued after Weindorfer moved to Tasmania, with Sutton being a regular visitor to Cradle Mountain. A small, beautiful pool nestled below the western face of Cradle Mountain, Suttons Tarn, is named in his honour.

In 1928, Dr Sutton published an examination of the vegetation and census of plants around Cradle Mountain. This remained the only such description of the area until the 1991 paper by Kirkpatrick and Balmer[4].

***Pultenaea weindorferi***

In September 1903, Weindorfer collected a pea plant growing in a swamp at Wandin, near the Lilydale-Warburton Rd. This was recognised as a new species and described by Dr F M Reader[5]. *Pultenaea weindorferi* is a tall slender attractive plant with its yellow flowers clustered near the tips of branches. It is an attractive garden plant. In his paper, Dr Reader states that he named the plant "in honour of the finder, Mr G. Weindorfer, who, during the last few years, has done much to extend our knowledge of the habitats of Victorian plants".

**Kate Cowle and marriage**

Kate Cowle was born in Tasmania in 1863. In 1879, her father bought a farm at Kindred and settled the family soon after in the nearby town of Devonport[6]. In 1901 following her parents' deaths, Kate moved to Melbourne, joining the Victorian Field Naturalists' Club in 1902. She became an enthusiastic member of the Club. At the same meeting as Gustav presented his paper comparing the alpine floras of Europe and Australia, Kate gave a paper 'Notes on a Visit to Mount Roland, Tasmania'. It was also published in *The Victorian Naturalist* (Vol. 20 commencing p. 70). This beautiful mountain dominates the skyline south of Kindred and Devonport. Their shared enthusiasm for native flora became a shared enthusiasm for each other and they were married in Tasmania on February 1st, 1906.

Their first night as a married couple was spent at the pleasant coastal town of Penguin. Then they travelled south and spent the next five weeks camped on Mt Roland. They collected plants, identifying and mounting them.

Weindorfer had started sending herbarium specimens back to the University of Vienna, Austria, in 1905 and it is possible that the Mt Roland collection went there as well. Many of Weindorfer's plants lodged with the University of Vienna were destroyed by a bombing attack during World War II.

The skyline south of Mt Roland consists of the jagged peaks of the Central Highlands, now mostly within the Cradle Mountain-Lake St Clair National Park. The most striking peak in this skyline is Cradle Mountain (at that time called Cradle Mountains). Gustav would have been struck by the similarity of this mountain scenery to that of his birthplace, Carinthia. A Carinthian journalist, while visiting Cradle Mountain with me in 2001, had the same reaction.

**Visiting Cradle Mountain**

The Weindorfers bought a farm near Kindred and Gustav tried his hand as a farmer. But this all changed when Gustav invited his friend Charles Sutton to come with him to Cradle Mountain. They entered the Cradle Valley, by coming over Hounslow Heath, in January 1909. He and Sutton found "a veritable flower garden, a true Eldorado for the botanist, and a magnificent place for the tourist..." This quote comes from the report on Weindorfer's second trip made the following summer accompanied by his wife Kate, and friend Ronald Smith[7]. The report abounds with the delights of the many botanical finds.

The 1910 camp in the Cradle area was set up in vertical-walled valley of Crater Lake. A comment to note was that their choice of tent sites was made easier because "all the surrounding lower shrubs ... were burnt out some time before our arrival" (pp 218-9). During their visit, the Weindorfers collected extensively. Leonard Rodway, Tasmania's honorary Government Botanist, assisted in the specimens' identification but no material from this trip exists in the Tasmanian Herbarium.

On January 4th, they climbed to the summit of the mountain, enthralled with the view for three hours. It was here, Ronald Smith reported 25 years later, that Gustav Weindorfer said, with hands outstretched

"This must be a National Park for the people for all time. It is magnificent, and people must know about it and enjoy it." (ref. 1, p. 31)

**Acting on the Vision**

Others before Weindorfer had recognised the potential for tourism of Cradle Mountain. These are discussed in the book *A View to Cradle*[8]. Some had set up accommodation facilities, but a long way from the Mountain. Following the 1910 expedition, Kate, Gustav and Ronald Smith's mother bought land in Cradle Valley. Ronald later established a timber mill for King Billy pine, *Athrotaxis selaginoides*, on his family holding, but Gustav used King Billy pine for another purpose. He built his forest home Waldheim on a site he and Kate had chosen during their visit.

The first guests arrived in the summer of 1912/13 and continued to be welcomed by Gustav until his death in 1932. Dorfer, as he became known, was apparently a warm and friendly host to all. In 1914, two guests, Austrian mountaineers, named one prominent point Weindorfers Tower.

One hundred years ago, attitudes to nature were different. Horses were taken into the valley, Weindorfer tried running cattle and kept chickens there, he established a vegetable garden in front of Waldheim (the terracing is still visible) and kangaroo (Bennett's wallaby) tail soup or badger (wombat) stew were served to guests. He tried stocking the lakes with trout or salmon. His main company many times was his dogs. His income was supplemented with fur skins.

However the major long-lasting impacts of man are from fire. A severe fire burnt over Hounslow Heath prior to 1900 and another savage fire burnt around Dove Lake after 1900 (ref. 4, p 119, with map p 120). One photo shows Dorfer with a party relaxing in grass on Perrys Peak with a full view of Dove Lake. The relaxing and viewing are now blocked by a thick growth of stunted eucalypts and shrubs.

**The Hermit of Cradle Mountain**

Weindorfer's authorship and botanical work almost disappear from the record with the establishment of Waldheim. Only one more article appears in *The Victorian Naturalist*, in 1919, and that deals with the wildlife at Cradle. The equivalent journal of the Tasmanian Field Naturalists Club, the *Tasmanian Naturalist*, has nothing from him. The Tasmanian Herbarium has only 12 specimens collected by Gustav, all but one collected from around Cradle Mountain. He did keep a diary; he wrote several articles for local newspapers but these seem to be more to attract visitors.

There were a few years taken with the building of Waldheim and its establishment. Then around 1916, his life changed dramatically and horribly. Both parents and his younger brother died. After only ten years of happiness with Kate, he lost her after a long illness. World War I brought him crazy rumours, including him being a spy who had set up a radio transmitter at Cradle, and ostracism from local communities. Weindorfer had become an Australian citizen in September 1905. His permanent move to Waldheim in 1919 was seen by many as a retreat from society but it was really to allow him to carry out his last and major project.

**Achieving the Vision**

Dorfer struggled for many years to get the Government to build a road into Cradle Valley. The kilometres visitors had to walk were slowly reduced. Once a track was established a local farmer took to bringing them in by horse and dray. The first car arrived in 1921, although photos abound of later cars being towed out of bogs by horse or bullock teams.

Tasmania's first national park at Mount Field was declared in 1917. By 1920, Gustav had recruited two major photographers, Fred Smithies and H J King to the Cradle Mountain national park cause. They put together a lantern slide show which Gustav took around the State. While in Hobart, he found sympathetic people in essential positions, leading to the first reservation. On 16th May 1922, from Cradle Mountain south to Lake St Clair was declared a Scenic Reserve and Wildlife Sanctuary. Its size and security of reserve status were slowly enhanced until 1982 when it became part of the Tasmanian Wilderness World Heritage Area.

Gustav Weindorfer continued to welcome guests to his home in the forest, and show them his surrounding treasures, until a severe heart attack in 1932 killed him. He died in sight of his mountain.

### Acknowledging Dorfer

Every New Year's Day, a small tribute service is held at his grave. The Weindorfer Memorial Service is a commemoration of the importance of Gustav Weindorfer.

### An end note

This article had its origins in a talk I gave at one Weindorfer Service and material I gathered for a talk given at the 2004 Launceston Seminar.

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Gustav Weindorfer in 1898



At Waldheim, early 1920s



Photos courtesy of the Weindorfer Memorial Service Committee

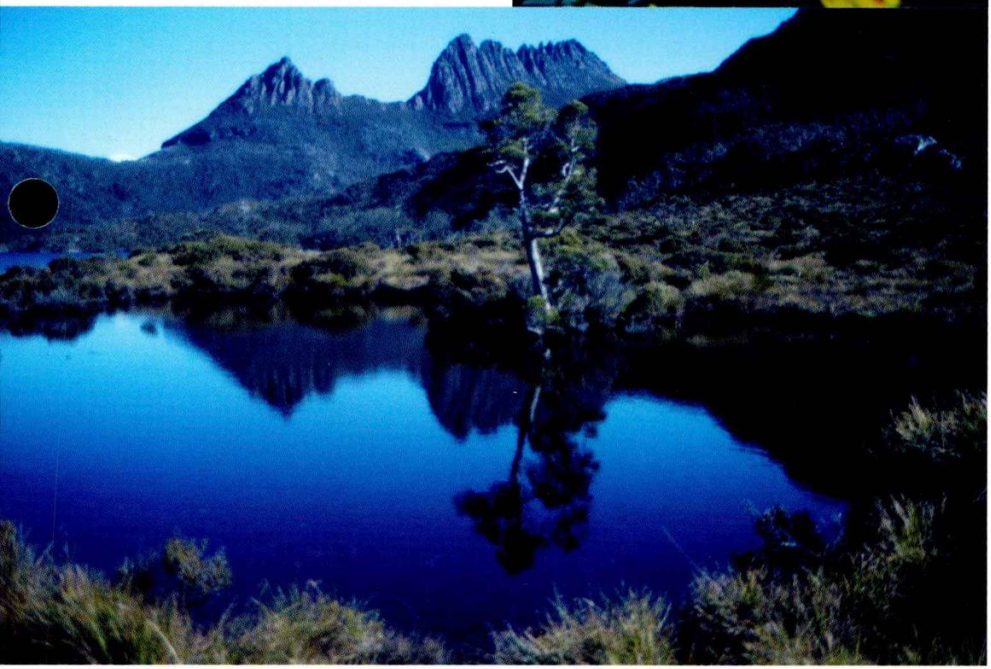




**Above:** Cradle Mountain as seen from Hounslow Heath in summer. This would have been Weindorfer's first close-up view of the mountain. Most of the white carpet is probably *Epacris serpyllifolia*.

**Right:** *Pultenaea weindorferi* at Karwarra Garden (thanks to Marilyn Gray).

**Below:** Cradle Mountain photographed from Pickford Tarn, with Dove Lake in the middle background. Photos: D Burns



# Mangles' Kangaroo Paw: Flower Pigments Identified

Karen Tran, Beng Tan, Steve Errington (Curtin University of Technology)
Shao Fang Wang (WA Chemistry Centre)

Much has been written about the horticultural aspects of Western Australia's state floral emblem and icon, namely, Mangles' kangaroo paw (*Anigozanthos manglesii*). Its unusual red-and-green flower is unique both in floral structure and bicoloration. Considering its aesthetic status, the nature and identity of the pigments underscoring the flower's vibrant coloration should be of interest to the aficionado.

**Chemical nature of flower pigments**

Ecologically-speaking, flower pigments play an important role in attracting insect, bird and animal pollinators. Three major classes of flower pigments are widely recognised, namely, flavonoids, carotenoids and betalins[5]. Of these, flavonoids, to which natural phenolic compounds, anthocyanins, flavones and flavonols belong, are the most important, occurring in and imparting coloration to flowers and ripening fruits. Flavonoids are water-soluble pigments bonded to sugar molecules localised in the plant cell vacuole[2]. In non-flower tissues, these compounds are also important to plant growth and development, including protection against the damaging effects of ultra-violet light and re-absorption of mineral nutrients from senescing leaves[1].

Anthocyanins are probably the most ubiquitous group of flower pigments. In their natural forms, they are stabilised by conjugation to sugar molecules. When the sugars are cleaved by acid hydrolysis, six major anthocyanidins can be recognised, namely, pelargonidin, petunidin, cyanidin, malvidin, peonidin and delphinidin; these chromophores collectively impart hues ranging from red-orange to red-purple and blue (delphinidin). The latter pigment is particularly significant because blue flowers are a premium. In flower species where delphinidin is not bio-synthesised due to absence of a specific gene (coding for the enzyme flavonoid 3',5'-hydroxylase) - thought to be lost during their evolution[5] - a blue form is a Holy Grail for plant genetic engineers and an *El Dorado* for their financial backers.

Most anthocyanidins are pH-sensitive. When vacuolar sap pH is changed, the extent of conjugation of the molecule is altered and this shifts the wavelength of light energy absorbed by the pigment. The first genetically engineered 'blue' rose turned out to be lilac because vacuolar pH was acidic; in hindsight, a pH-controlling gene has to be co-introduced with the delphinidin gene to achieve a blue outcome.

**Acid test**

Anthocyanin flower pigments can be extracted from flower tissues in the laboratory with acidified alcohol, yielding a red extract. If the extract is rendered alkaline with, say, ammonia, the red extract turns blue. This pH-dependent and reversible, litmus-like colour change is characteristic for all anthocyanins.

**Analysis**

The flower of Mangles' kangaroo paw is bicoloured: The flower stem and ovary are covered with furry red hairs and the perianth is similarly felted but with iridescent green hairs. The acidified alcoholic extract of red (stem and ovary) and green (perianth) hair cells are both red, indicating their anthocyanin nature.

But, what pigments are represented and do the two different coloured hairs share the same pigment composition?

In our laboratory analysis involving high performance liquid chromatography (HPLC), the extracts are first hydrolysed in hot acid to remove conjugated sugar molecules, yielding sugar-less (aglycone) anthocyanidin(s) and co-pigments. A hydrolysed extract is then passed through a steel column packed with special chromatographic material in a steady stream of organic solvent. The different flavonoid pigments present in the extract are separated by their interactions with the chromatographic material and carrier organic solvent. They are detected by their light absorption at selected wavelengths as they leave the column, with each compound displaying a different 'retention time' in the column. For the analysis to be meaningful, 'standards' of pure anthocyanidins, flavonols and flavones (commonly known flower pigments) are also included in the chromatographic assays. The latter two occur naturally in flowers and leaves as a pale-yellow 'undercoat' to the stronger-coloured anthocyanins. Pigment identity is deduced from retention time *vis-à-vis* authentic standard but is corroborated by the compound's known 'absorption spectra'[3], or profile of absorption across a continuum of light wavelengths.

**Results**

The findings are summarised schematically in Table 1 (page 166). The dominant pigment is cyanidin, a rich red pigment found commonly in the skin of red cherry and red onion.

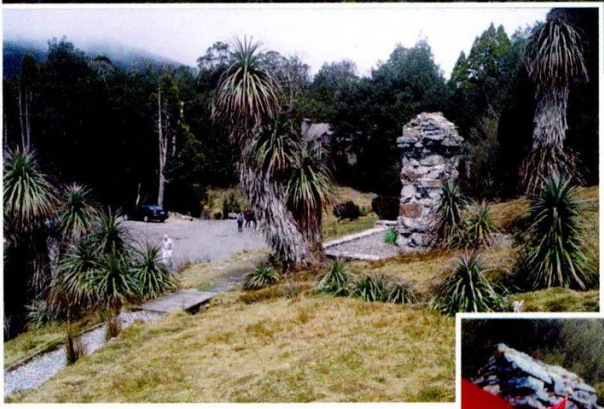
The different red intensity of ovary and stem hair cells can be explained by pigment concentration and co-pigmentation with flavonol and flavone. As alluded above, the lighter-coloured flavonol (quercetin) and flavones (luteolin and apigenin) collectively constitute a light 'undercoat' for the strongly coloured cyanidin. A couple of detectable phenolic compounds, whilst present, are probably insignificant in their contributions to the overall flower coloration but this is purely a conjecture. What needs to be articulated is the nature of conjugated sugar molecules, which can be performed with further analysis of non-hydrolysed extracts. Cyanin, for instance, occurs naturally as glucose-bonded cyanidin, while quercetin, in its natural form known as rutin, conjugates with a two-sugar combination of rhamnose and glucose.

**Concluding comments**

The difference in chemical composition accounting for the red and green flower bicoloration in Mangles' kangaroo paw appears to be relatively small – merely in a couple of flavones and phenolics. Although differing markedly in hue, both contain copious quantities of cyanidin. The difference between red and green coloration is best explained by difference in cell pH. In a separate and earlier investigation, sap expressed from snap-frozen green hair cells was



**Above:** Taken from Mt Kate Sept 1999. Perrys Peak is at the centre of the photo in shadow. In the foreground is King Billy pine rainforest. The fires around 1900 would have missed this rainforest, but burnt most of the vegetation beyond. Photo: D Burns

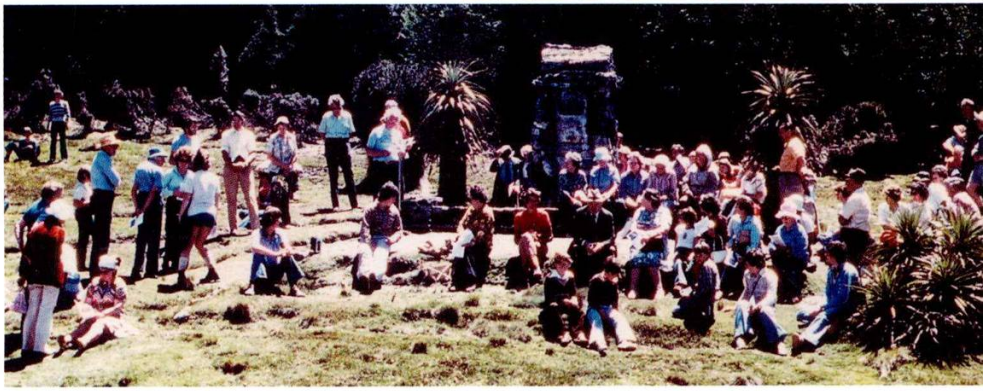


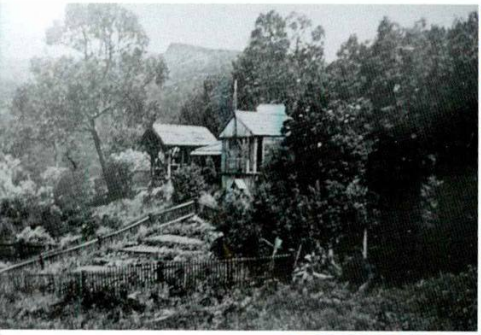
**Above:** Gustav Weindorfer's grave and Waldheim. The pandanis, *Richea pandanifolia*, have grown since 1932.

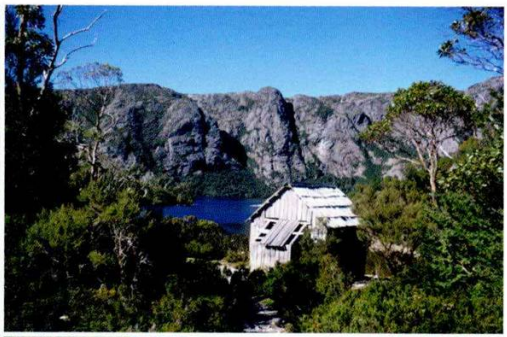
**Right:** Weindorfer Memorial Service, early 1980s, Dick Burns leading the service. Photos: D Burns

**Below:** Weindorfer Memorial Service, 1979. Photo courtesy of Weindorfer Memorial Service Committee

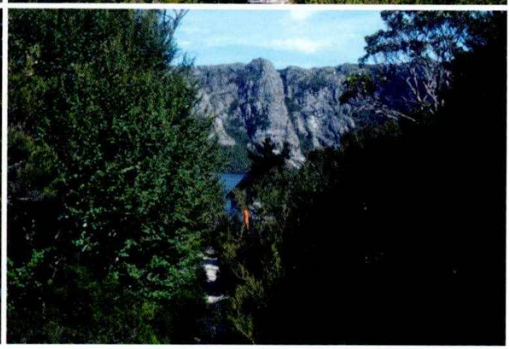








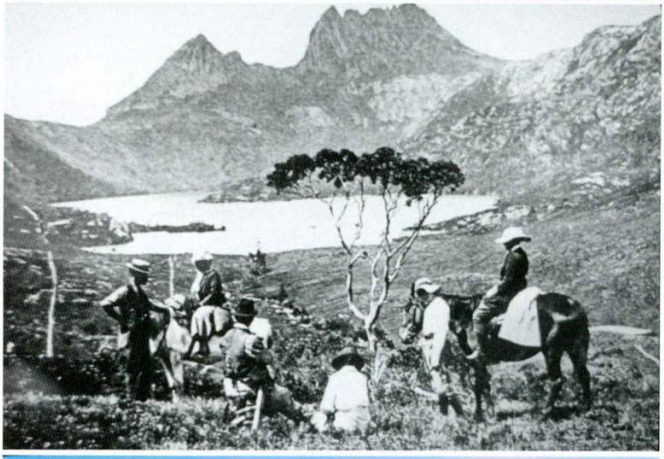




**Top Left:** Waldheim in Jan 1923. Photo courtesy of Cradle Mountain Visitor Centre (CMVC)

**Above Left:** Waldheim in Dec 2003 - note the difference in the background tree growth to top left. Photo D Burns

**Top Right:** Crater Lake early 1970s and site of the 1910 camp. The King Billy shingled boat-shed was built after Dorfer's time. Photo D Burns



**Above Right:** Same view in 2003. D Burns

**Centre:** Christmas 1920 on Perrys Peak. Dorfer is on the left. The scars of fires can be seen on the left side of the valley, across Little Horn and under the main peak of Cradle Mountain. The dark triangle on the left-hand slope is rainforest that escaped the fire. Photo courtesy of CMVC



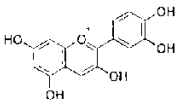
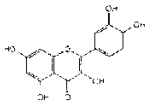
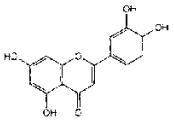
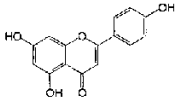
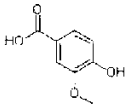
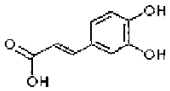
**Bottom:** Dove Lake and Cradle Mountain photographed from above the car park. The unburnt wedge can be clearly seen. D Burns

found to have a pH of 5.7 in contrast to a slightly more acidic pH of 5.2 for sap in red hair cells[4]. As explained at the outset, pH can alter conjugation properties in anthocyanins, and this can result in spectral shift of light absorption and visual change in hue, which can vary from subtle to profound.

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**Table 1. Pigments identified in red and green flower hair cells of *Anigozanthos manglesii*** (Photo page 185)

| Hair Colour | Flavonoid | Name | Structure |
|---|---|---|---|
| red / green | anthocyanidin | cyanidin (A) (dominant pigment) |  |
| red / green | flavonol | quercetin (B) |  |
| red | flavone | luteolin (C) |  |
| green | flavone | apigenin (D) |  |
| red / green | phenolic | 4-hydroxy-3-methoxy-benzoic acid (E) |  |
| green | phenolic | 3,4-dihydroxy-cinnamic acid (F) |  |

# Australian Arid Lands Botanic Garden

Chris Nayda

The AALBG is situated 2km north of Port Augusta SA on the Stuart Highway. The garden area covers 250 ha and includes natural vegetation such as *Acacia papyrocarpa* (Western Myall) woodland (which is the emblem of the garden) and chenopod plain.

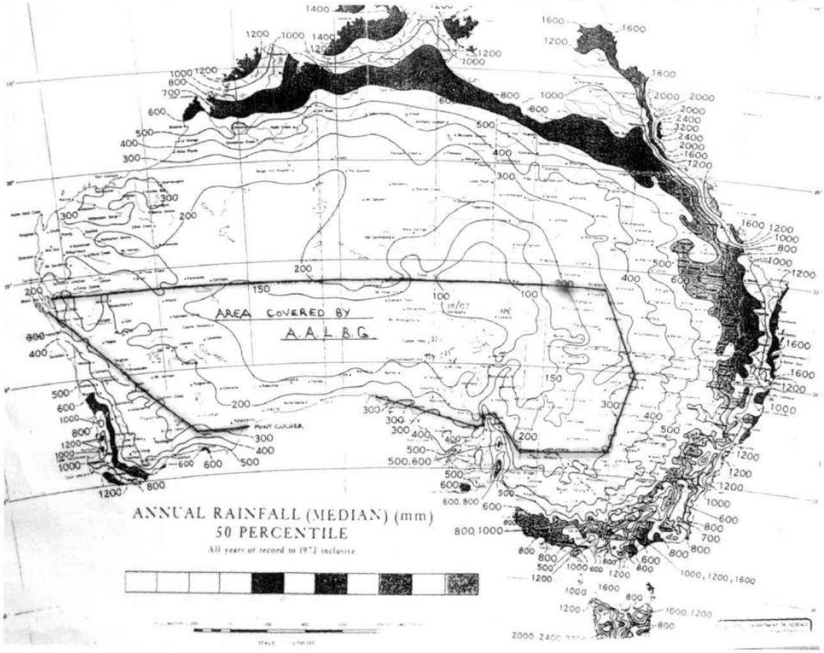
A feature of added interest is the coastal vegetation including mangroves and samphire on the shoreline of Spencer Gulf, which forms the eastern boundary.

Arid plants including eremophilas, acacias, eucalypts, calothamnus, hakeas and many more have been collected from the five mainland states from the under 300m rainfall areas (see diagram below), grown from seed or propagated from cuttings and planted in the garden.

Planting started in 1996 and after 11years looks wonderful giving a taste of what to see further north in the Flinders ranges and beyond.

Our *Eremophila* garden, which has over 150 different varieties, is our most popular section. Many of the species are now being grown by the Friends of the AALBG to raise money for the garden and sold to the public to raise awareness of water saving plants.

**Editor's Note:** It's definitely worth going to see if you are anywhere nearby or taking a trip across the Nullarbor. Note: The flies are very friendly (i.e. they take a number for a spot to land) and you may need something stronger than 'Aerogard' to keep them at bay.



**Australian Arid Lands Botanic Garden**
**Above:** Early morning in the eremophila garden. Taller shrub in background is *Eremophila dalyana* with groundcover *Eremophila biserrata* underneath. Front left small grey leaf shrub *Eremophila lachnocalyx*, next is *Eremophila divaricata* x *polyclada* and right hand corner is a *Eremophila glabra*.
**Right:** Acacia papyrocarpa (Western myall), which is the emblem of the garden and chenopod shrubland looking west from entrance road
**Below:** Scaevola collaris (Dune or beaked Fanflower) All photos: C Nayda



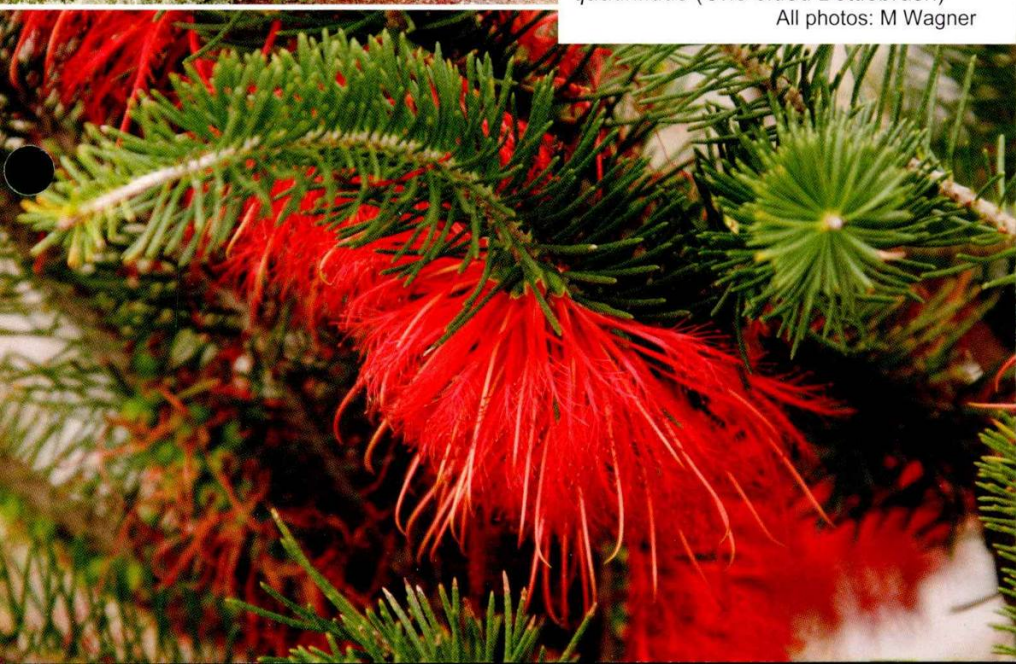








**Top Left:** *Eremophila macdonnellii*
**Left, Above & Below:** *Calothamnus quadrifidus* (One-sided Bottlebrush)
All photos: M Wagner



# Book Review: Rainforest Trees

of Mainland South-eastern Australia, Revised edition _____ Barry Kemp

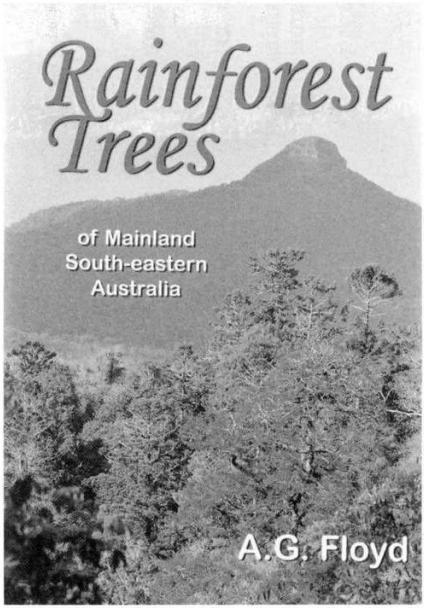
The first edition of this definitive work was published in 1989, but unfortunately allowed to go out of print. It made available a wealth of information accumulated over several decades of rainforest study by skilled botanist Alex Floyd (recently awarded an OAM). There have been many taxonomic changes since then and when rainforest enthusiasts Hugh and Nan Nicholson decided to re-publish the book, Alex revised the text to include 18 newly described species, e.g. *Eidothea hardeniana* (Nightcap oak) and *Wollemia nobilis* (Wollemi pine) as well as numerous changes to genera and families.

In rainforest, more often than not, leaves are all that can be found to aid identification. This book has easy to use 'dichotomous keys' based on leaf characters alone. The 402 species, grouped in families, each have a line drawing and extensive detailed descriptions, including habit, bark, leaves, flowers and fruit. Synonyms, common names, habitat and distribution are also included, and for most, the results of seed germination trials.

There is an interesting introduction with details of the history of rainforest in Australia, factors affecting it's present distribution, structural types, and good pictures of different bark types and special features like buttresses and flutes. A comprehensive glossary is aided by photos of flowers and fruits.

Some of Hugh Nicholson's excellent colour photographs have been added to those of Alex Floyd's which were used in the first edition. More would have been nice, but of course that would increase the price. Although small print was needed in order to include all of the information in 443 pages, good quality paper makes it easy to read and it is firmly bound with a hard cover and a dust jacket.

This book deserves pride of place in the library of all rainforest enthusiasts, botanists, nature lovers and any one interested in Australian rainforest.




Rainforest Trees of Mainland South-eastern Australia, Revised edition by Floyd, AG 2008 Terania Rainforest Publishing, Lismore. RRP $75

# Our Garden 52

87 Daintree Drive, Logan Village, Qld _____ Jan Glazebrook

Our one-hectare garden straddles a sandstone ridge 40 km south of Brisbane. Although we are only 30 km from the sea, our climate is similar to that of Ipswich, west of Brisbane. Our highest temperature has been 46°C and our lowest winter temperature -6°C. Fortunately, these temperatures don't occur every year. Our rainfall is also lower than surrounding areas as we are between the Birnam Range to the west and the Darlington Range to the east. Average rainfall is about 950 mm per year. This is what we depend on, as we are not on mains water.

The garden itself has extensive areas of conglomerate sandstone, which breaks down to sand and gravel. This is the garden soil. "Why would anyone choose to garden in such a location?" I hear you ask. We saw it as an opportunity to grow dryland plants such as grevilleas, banksias, wattles, West Australian melaleucas, and more. The conditions certainly suit grevilleas and acacias. We have over 300 different grevilleas and about 160 different acacias.

We are unashamedly collectors of native plants, with large collections of *Eremophila* (120 spp.) *Melaleuca* (90 spp.) and *Dodonaea* (20 spp.).

About a quarter of the area has been left in its natural condition with wattles and gums being the dominant trees with Brush Box and *Alphitonia excelsa*. A heathy understorey is dominated by Melichrus adpressus. Colour is supplied by small wattles, gompholobiums, dillwynias, pultenaeas and pimeleas, interspersed with native grasses, lilies and orchids. Five species of *Lomandra* and four species of *Dianella* are native on the site and have been left, even in the cultivated areas. There is abundant bird life all year round, but, in spring, when the grevilleas are flowering, the sound of the birds is overwhelming. Fruit eaters have been catered for, with fruiting rainforest species, including Lilly-pillies, *Austromyrtus* and palms. Some of the more uncommon bird visitors to the garden have been Satin Bower Bird, Whip Birds, Bush Turkey, Rose Robin, Scarlet Honey-eater, Whistling Ducks, Button Quail and Rufous Fantails, with Crested Hawks, Grey Goshawk and Wedge-tailed Eagle seen overhead. Native animals we have seen on the block include Koalas, Brush-tailed and Glider Possums, Bandicoots, snakes, Legless Lizards, Goannas and Echidnas. Frogs were abundant when we first arrived, but their numbers and variety have diminished.

In the garden area, the soil has been improved with copious amounts of mulch (cane trash and horse manure). Organic fertilisers are used sparingly and Dolomite has been added to supply the Magnesium that is deficient in our highly acid soil, which has a pH of 4.5.

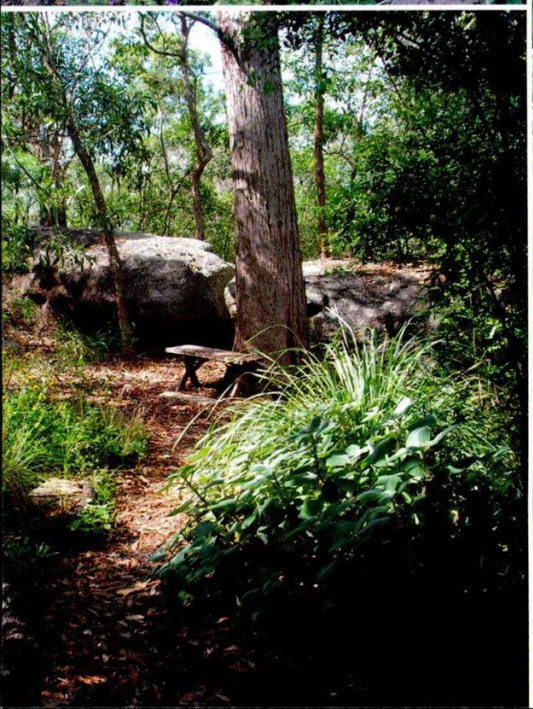
Gardening has been a steep learning curve, with our ideas changing over the years. We now plant in depressions, and add water crystals to the planting holes to give our plants a fair start and then we hope for rain to get them established before the next dry time.

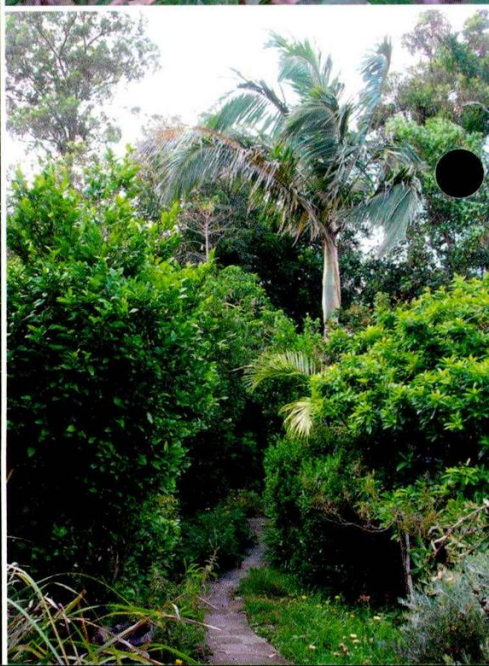












## Our Garden 52: 87 Daintree Drive, Logan Village, QLD

**Above:** Front garden edged with natural sandstone from the property
**Bottom Left:** *Xanthorrhoea johnsonii* with *Xerochrysum bracteatum*
**Bottom Right:** Kangaroo paws

**Opposite**
**Top Right:** Red kangaroo paw, with prostrate *Banksia integrifolia* and grafted *Grevillea* 'Lana Maree' and *G. variifolia*
**Top Left:** *Acacia complanata*
**Centre Left:** *Eremophila macdonnellii*
**Centre Right:** *Banksia plagiocarpa*
**Bottom Left:** Natural sandstone outcrop with rainforest planting
**Bottom Right:** Courtyard with rainforest shrubs and palms

All photos: J Glazebrook





We do have a bore, but it supplies poor quality water with 3,000 ppm salts and a pH of 8.5 and it runs out in very dry periods. Weeds are usually not a great problem except in very wet summers when they can become rampant.

Overall, we have created an interesting garden of unusual plants suited to our conditions.

We belong to a sustainable gardening group and only use organic pest controls, such as molasses and seaweed spray, and organic fertilisers. This safeguards our native birds and animals and encourages a healthy soil biota. Denis has a large vegetable garden, and an orchard area where we run chooks.

Being the leader of a native small plants interest group, which meets bi-monthly, I have many small plants and continue to try any I can get from around Australia. Many fail or only survive for one season, but others are quite at home. The fun is in the trying.

# Update on Native Figs

Ian Anderson

After visiting Mallacoota late in 2007 I wrote and submitted the article on native figs that appeared in the September 2007 edition of Australian Plants.

On my next visit to Mallacoota some months later I again checked on the plant which I said in the article looked like a strangler Port Jackson Fig (*Ficus rubiginosa*). It was growing in a fork of a large *Angophora floribunda* tree in the Mallacoota camping ground. A photograph of it was included in the article. I suggested the seed might have some from the mature Port Jackson Fig growing elsewhere in Mallacoota.

As on the previous occasion, access to the tree was difficult, with occupied tents pitched close to it. It was now clear though, after a good summer season with ample rain that the plant in the fork, which had grown significantly, was not a fig but an aggressive example of a mirror plant (*Coprosma repens*). This species, originally from New Zealand, has been planted in some Mallacoota gardens. The leaves are somewhat similar to those of native figs, especially from a distance. I had no idea the mirror plant could behave like a strangler fig and establish and grow in the fork of a tree as this one has done.

There may still be examples elsewhere in the Mallacoota district of young Port Jackson Figs growing as stranglers given there is at least one adult tree growing there.

I regret any misunderstandings that my previous observation might have caused.

# SGAP: The Story of Arthur Swaby and the Society for Growing Australian Plants

A Book Review _____ by Esme Blackmore

If you have ever wondered how the Australian Plants Society came into being, then wonder no more.

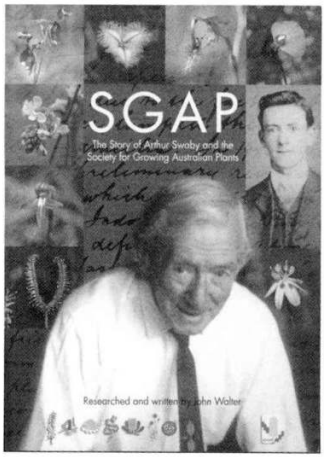
John Walter, then secretary of the Australian Region, having "compiled a brief 'history' of SGAP in Victoria" to celebrate the 40th anniversary, was inspired to write a comprehensive history of the Society, which commemorates the 50th anniversary of a small group which is now a national organisation.

There are ten chapters in all, each one dealing with a different aspect of the society. The early chapters are heavily directed towards Victoria, for that is where the Society had its origins. The interest shown by a disparate group of amateurs in studying, propagating and growing Australian plants was eventually harnessed by AJ Swaby, another amateur, until the inaugural meeting of what Swaby wanted to call 'Australian Growers of Australians', was held on 12th March 1957. Eventually the accepted name was the Society for Growing Australian Plants (SGAP).

Each of the successive chapters deals with a different aspect of the Society, including the formation of ASGAP, the journal *Australian Plants*, the Study Groups and their achievements and contributions, and the achievements of the Society as a whole over fifty years. Six appendices deal more briefly with other aspects of the Society.

This is a serious attempt to write the history of the Society, widely researched with reference to original documents, personal interviews and correspondence, all attested to with numerous footnotes. There are many illustrations, reproduction of old black and white photographs and historic documents. But there is no holding back from the many conflicts that enlivened, not only the origins, but also the continuing endeavours of the society. The clash of strong personalities makes the final achievement all the more interesting.

Of course, such a history cannot encompass all the details of every branch of the Society. It now remains for the states to take up the challenge and tell their story. This may embellish what has already been told, may disagree with aspects of this first history, but will certainly add to the awareness of the importance of such a society and an understanding of the desirability of protecting our natural heritage.




SGAP: The Story of Arthur Swaby and the Society for Growing Australian Plants, by Walter, JB 2007. Australian Plants Society (SGAP Victoria).

**ACRA Plant Profiles**
**Above:** *Callistemon* 'Rebecca'
**Right & Below:** *C.* 'Benalla Beauty'
Photos: Courtesy ACRA, © Australian National Botanic Gardens



***Callistemon* 'Rebecca' (ACRA)**

**Origin:** This plant was grown from seed purchased as *Callistemon pallidus* by the applicant Mr Glen Wilson around 1990 and has been in cultivation since then. Application received in October 2006.

**Description:** This is an open, low spreading shrub, which grows to approximately 1 m high by 1.5 m wide with grey green foliage. The large bottle brush flowers appear in October-November. Individual flowers are dusty pink/pale mauve and are 100 mm long and 50 mm in diameter.

**Diagnosis:** A most attractive low spreading shrub with an unusual dusty pink/pale mauve flower colour.

**Colour Code:** RHS 1995
Leaves: Green Group 138A
Flowers: Red Purple Group 70B fading to 64B

**Cultivation:** It is adaptable to a wide range of soil types and shows a high degree of frost hardiness, though may suffer frost damage to the younger shoot growth when grown in areas that experience severe frost. Moderately drought hardy. Strikes easily from cuttings.

***Callistemon* 'Benalla Beauty' (ACRA)**

**Origin:** This plant was found in a private garden in Benalla by the applicant Mr Glen Wilson who has been collecting and growing *Callistemon* cultivars for more than 40 years. Application received in October 2006.

**Description:** This is an open, medium to large shrub, which grows to approximately 3 metres high and 2 metres wide. Leaves are dull green in colour. The bottle brush flowers form in bunches from September to November. Individual flowers are bright pink, fading to paler tones and are 60-70 mm long and 25 mm in diameter.

**Diagnosis:** The distinguishing features of this cultivar are bright pink bottlebrush flowers, which are borne in very large bunches.

**Colour Code:** RHS 1995
Leaves: Green Group 146C
Flowers: Red Group 51A to 55B

**Cultivation:** It is adaptable to a wide range of soil types and shows a high degree of frost hardiness, though may suffer frost damage to the younger shoot growth when grown in areas that experience severe frost. Strikes easily from cuttings.

# Merger of Dryandra into Banksia

Some background to the merger

Kevin Thiele
Western Australian Herbarium

A paper I published recently with Austin Mast from the University of Florida has created controversy among native plant and wildflower enthusiasts. Mast and I recommended that the two well-established genera *Banksia* and *Dryandra* should be merged into one genus (which under the International Code of Botanical Nomenclature must be the older genus, *Banksia*). The recommendation has been accepted by the major Australian herbaria and by the Australian Plant Census project of the Council of Heads of Australian Herbaria. To effect the merge, we have created new names for all *Dryandra* species in *Banksia* (for example, *Dryandra arborea* has become *Banksia arborea*). Not surprisingly, this move has caused a stir in the community.

Many people will be asking the question - why on earth would anyone do such a clearly nonsensical thing as to sink *Dryandra* into *Banksia*, when they are such obviously good genera?

Many people complain that the 'new taxonomy' seems complex and seek a return to 'the old days' when anyone with a hand-lens could work out and understand the relationships of plants. But the differences between the 'old' and 'new' taxonomy is also a fascinating story, some of which I'd like to tell in this article.

I plan to approach the *Banksia* - *Dryandra* issue in several stages, firstly with an explanation for some of the reasons why taxonomists 'keep changing the names', followed by a short history and philosophy of classification, and finally with a discussion of the reasons behind the Dryandra change itself.

**Why names change**

There are several main reasons why taxonomists from time to time need, or choose, to change the name of an organism such as a plant.

Firstly, the naming of plants is covered by a set of rules - the International Code of Botanical Nomenclature - which sets out how to correctly name plants and how to resolve cases where two or more names have been used for one species. It sometimes happens that applying the rules requires us to change a name.

For example, if a species named by one botanist turns out to have been previously validly named by an earlier botanist, then the Code stipulates that (except under certain conditions) the earlier name must replace the later name. This is a sensible rule when you think about it, as it gives due recognition to the first person who named a particular species, which is only fair.

Secondly, and more importantly for the purpose of this article, names may change because our knowledge grows. For example, when Linnaeus - the father of taxonomy, whose tercentenary was celebrated in 2007 - first described the world's grasses, he placed them all into a single genus, *Poa*. As more and more grasses became known, it became clear that this was

simply silly - imagine if all the world's *c.* 9000 species of grass, from bamboos to spinifex, were called *Poa*! It wouldn't be a very useful taxonomy.

Interestingly, the fact that names often need to change when our knowledge grows is actually a problem caused by the very system of naming for which Linnaeus is famous.

Linnaeus formalised the binomial naming system with which we are familiar, in which every species has a double-barrelled name (such as *Poa annua*), much as do names of people (e.g. John Smith) and of many things (e.g. apple pie). This was a brilliant innovation. Not only does it make it relatively easy to create a unique name for every species, but it also encodes handy relationship information in the name. That is, encoded in the name *Poa annua* is the fact that the species in question belongs in the genus *Poa*. This makes it easy to remember where a species fits as well as what it is.

But here's the nub of a problem - if the name encodes where a species fits, then you need to change the name if you decide that it fits better somewhere else. I'll return to this issue later, as it lies at the heart of the *Banksia - Dryandra* issue. As an aside, I expect that Linnaeus himself would have been mortified to be told that his binomial system causes problems, largely because he would have regarded that once a species was named and placed into a genus by Linnaeus then it would never need to be renamed into another genus by anyone else!

So, names sometimes need to change when our knowledge - our understanding of the relationships of species - grows. Taxonomy and systematics, like any science, evolves. Who would tell dream of telling physicists that their new understanding of the Universe is too complicated so we should stick with Newton. It doesn't make sense. Similarly, taxonomy grows and changes, and because names are the core of taxonomy, I believe that it would be tragedy if they were to stay the same and not reflect new knowledge and understanding.

**Why taxonomies change**

So why do taxonomists sometimes change their minds about the relationships of species? To understand this requires us to understand the philosophy and practice of taxonomy and systematics.

What taxonomists and systematists attempt to do is no less than to understand and describe, in great detail, the patterning of all life. This enterprise began well before Linnaeus, when early Greek philosophers such as Theophrastus (370–285 BC) began classifying plants.

Taxonomy began with the obvious observation that some species naturally group with others. Any schoolchild can tell you that a mouse and a rat 'go together', and both are clearly very different from a cow. Similarly, *Dryandra nivea* and *D. brownii* clearly fit together, and both are obviously different in many ways from *Banksia coccinea*.

For the vast majority of our history, from Theophrastus through Linnaeus and right up to the mid-20th Century, taxonomies were constructed by simply putting together things that clearly 'go together'. In the early days, the thinking was very simplistic - for example, before Linnaeus all 'trees' were classified together,

separate from all 'shrubs' and 'herbs'. Linnaeus introduced a more sophisticated method, grouping plants based on the numbers of stamens and pistils. The French botanist Antoine Laurent de Jussieu used a more sophisticated approach still, arguing for what we would now call a 'whole-of-evidence' approach - assess all the characteristics (of leaves, flowers, fruits etc.), then group like with like according to overall similarities and differences.

But there's an interesting difficulty with the approaches described so far. Plants are complex organisms, with many characteristics. Suppose one taxonomist believes, from observation of certain characteristics, that species A and B naturally 'fit' together into one genus, and species C and D naturally form a second genus. Suppose a second taxonomist believes, from observation of perhaps other characteristics, that it works better to put A and C into one genus and B and D into another. How could we choose which was the better taxonomy? We would have to either decide which arrangement worked better for us, or choose to believe the more respectable and important taxonomist. Both are very subjective and unsatisfactory judgements.

Without a clear underpinning idea for why some things 'go' with others, the question of which classification is better is probably meaningless anyway. It's like asking which is better, a taxonomy that groups cups with bowls and plates with saucers, versus another that groups cups with saucers and plates with bowls. There is no reason to suppose that either is better than the other; both are equally valid (and equally meaningless).

Taxonomy of organisms, fortunately, is different from taxonomies of crockery or stamps, because it does have an underpinning framework, provided by Charles Darwin when, in the Origin of Species, he introduced the concept of evolution by descent with modification.

Darwin convinced scientists that all living organisms were part of a single 'family tree' of life (a phylogeny). This is a grand idea and one of the most important unifying concepts in biology. It explains beautifully, amongst other things, why mice and rats are similar (because they share many features inherited from a recent common ancestor), and cows are fairly different (because the common ancestor of rats, mice and cows is more distant). Because most of us simply accept evolution as self-evident now, it's sometimes hard to grasp the revolution that Darwin brought to our thinking about nature.

Taxonomists, after Darwin, gradually accepted the idea that the purpose of a classification is not simply to group superficially like with like, but to classify organisms in a way that reflects their evolutionary relationships in some fashion. Further, Darwin provided a framework for choosing between classifications - because organisms evolved, and because there appears to be only one tree of life, some classifications (those that more closely reflect the patterns of evolution) are better than others.

For many years until the middle of the 20$^{th}$ Century, taxonomists accepted the idea that classification should reflect evolution, but really had no idea how to put it into practice. There was a vague hope that grouping organisms according to overall likeness would result in a classification that reflected in some way the tree of life. But with no way of testing the fit, if two taxonomists came up with different classifications, you still pretty much believed whichever you preferred.

Darwin had provided taxonomists with an underpinning framework, but no way of applying that framework to the problem of taxonomy.

A breakthrough came in the 1950s when a German entomologist, Willi Hennig, developed a method for mathematically calculating the most likely family tree or phylogeny from the patterns of characteristics in a group of organisms. Hennig's method, now called cladistics (and other similar methods developed in the last few decades), allows taxonomists to find a way through the vast array of similarities and differences that occur in any group of organisms, and to work out a best fit with the tree of life.

It's outside the scope of the present article to explain cladistic methods and related analysis techniques in detail (it is possible to explain cladistics simply and I may do this in a later article). The most important point is that these methods, at least in theory, are rigorous, repeatable and produce classifications that can be tested, rather than vague and untestable ideas as has been the case in the past. It was these methods that Austin Mast and I used to try to understand that branch of the tree of life that contains the banksias and dryandras.

**The evolution of *Banksia* and *Dryandra***

To understand the significance of the results that Mast and I obtained, consider Figure 1. It shows, I believe, what most people would have considered the relationships of Banksia and Dryandra to be under the previous taxonomy. Having two separate genera makes it natural to imagine two branches on the tree of life, one comprising all the *Banksia* species and one comprising all the *Dryandra* species

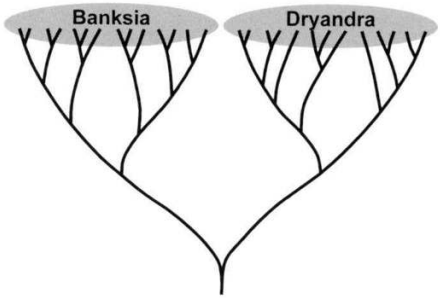



Figure 1. The traditional understanding of the relationship between *Banksia* and *Dryandra*

By contrast, when Mast and I used cladistic methods to investigate the same question, we got the surprising, and very interesting, result shown in Figure 2. Our studies suggest that *Dryandra* is a branch that springs out of the greater *Banksia* branch, instead of being a sister branch. That is, dryandras are modified and specialised banksias.

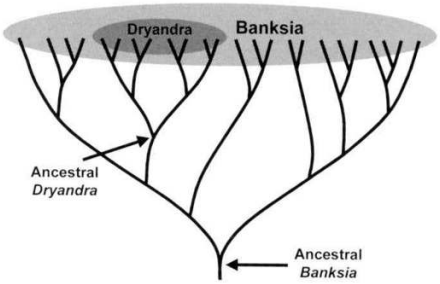



Figure 2. The new understanding of the relationship between *Banksia* and *Dryandra*

Look at Figures 1 and 2 again in terms of ancestors and descendants (shown by arrows on the figures). If Mast and I are correct, then *Dryandra* comprises all the descendants of the ancestral *Dryandra* species (the one that first evolved from

a *Banksia*). In modem taxonomy, such a group is called monophyletic. But *Banksia*, as traditionally understood, comprises only some of the descendants of the ancestral *Banksia* (that is, only those that haven't subsequently evolved into dryandras). Such a group is called paraphyletic. Viewed in this way, the two traditional genera are not equivalent - one is a monophyletic group and the other is a paraphyletic one.

This difference (between what we now call monophyletic and paraphyletic groups) was of great interest to Greek philosophers at the time of Plato, who pointed out to the Greeks a problem in the way they thought of themselves and of others. Many Greeks regarded that there were two classes of people, Greeks and Barbarians. Plato pointed out that these two classes are different in kind. 'Greeks' is a true class, because it comprises all people of Greek descent. But 'Barbarians' is not a class at all, as it comprises the class of all people minus the class of Greeks. It's a grouping that can only be defined by what it's not rather than what it is.

Plato's problem with a group like 'Barbarians' is that some members of the group are more closely related to members outside the group than they are to other members inside the group - some 'Barbarians' are more closely related to the Greeks than they are to other 'Barbarians'. This makes nonsense of the 'Barbarian' group.

A little reflection shows that this is exactly the same as the situation with *Banksia* and *Dryandra*. Because dryandras evolved from inside *Banksia*, some banksias are more closely related to dryandras than they are to other banksias. To most modem taxonomists, this makes the old *Banksia* an untenable group.

Returning to Figures 1 (the old way of imagining Banksia and Dryandra) and Figure 2 (the new understanding), it's interesting to ask: why were dryandras considered as separate from *Banksia* in the first place, if they are nested within it? Figure 3 is another way of drawing the new understanding. In this figure, *Dryandra* still emerges from within *Banksia*, but since evolving it's very much gone its own way and has diverged a lot in morphology. It's like a wild branch that, once evolved from *Banksia* goes off on its own. This is why we've always thought of *Banksia* and *Dryandra* as two quite separate genera. The changes that have occurred on the *Dryandra* branch since it evolved from its *Banksia* ancestor make it look so different that it's relationship as a part of *Banksia* has been obscured.

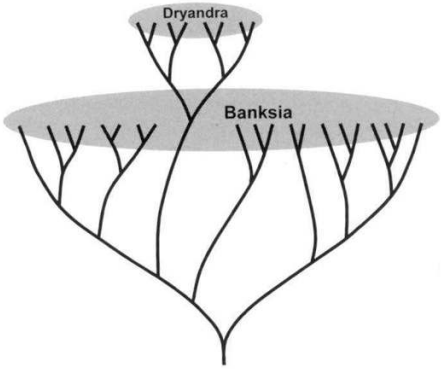



Figure 3. Another way of looking at the relationship between *Banksia* and *Dryandra*

**What to do with Dryandra?**

In the discussion above I've tried to explain what we believe is the true pattern of relationships of the species in the *Banksia - Dryandra* branch of the tree of life, derived from our cladistic analyses. To reflect the new knowledge, we have chosen to put *Dryandra* in its rightful place, as a specialised offshoot within the *Banksia* branch. Unfortunately, under the rules of the Code and under the new, widely accepted tenet in taxonomy that we should name only monophyletic branches in the tree of life, this requires that we change all the *Dryandra* names.

We understand that many people will question, and criticise, what we've done. To help discussion, I believe there are three possible criticisms - firstly, that the cladistic methods used in our analyses are flawed, secondly, that the information we used for the analyses is incorrect or inadequate[1], and finally that even if the answer is correct, we should still not have merged *Dryandra* into *Banksia*.

The first two criticisms can be dealt with quickly. If either the cladistic method is fundamentally flawed - that is, it cannot reconstruct the branching pattern of the tree of life - or the data we use are flawed in some way, then we would expect that running the same analysis on two or more different and independent data sets would give different and contradictory results.

In fact, we found the opposite. Mast analysed several independent genes, and I analysed morphological and anatomical characters. All analyses pointed to the same answer (at least in broad outline). The fact that we got more or less the same answer from independent data sets gives us confidence that the analysis, both in terms of data and method, is giving an answer that must mean something. It can't be discounted easily as simply nonsense or an error.

Interestingly, this is an important difference between modern taxonomy based on cladistics and the old intuitive taxonomy - when we use cladistics we can rigorously test our answers. No such test is possible using the old ways.

The third criticism - that despite our new knowledge of the relationships in *Banksia - Dryandra* we should maintain the status quo - is also, I believe, hard to argue. As explained above, this would result in two genera that are quite different in kind, and would result in the anomalous situation of some *Banksia* species being more closely related to *Dryandra* species than they are to other *Banksia* species, something that Plato himself would object to. I also believe that if we were to keep the two genera, then generations of newcomers would continue to think that banksias and dryandras are related in the way of Figure 1, which is false.

Such thinking may then hold back future interesting research. For example, the difference in distribution of banksias and dryandras can be very neatly explained now that we understand their true relationships. Dryandras are restricted to south-west Western Australia, while banksias occur more widely around southern, eastern and northern Australia and into the islands to our

[1] This criticism is particularly common when molecular data are used. The argument goes like this: the gene sequences used in molecular analyses amount to a tiny fraction of the total set of genes in a plant, so how can we possibly get any meaningful answer from such a tiny sample?

north. Our new understanding helps explain this - the dryandra branch evolved from its *Banksia* ancestor relatively recently, after the drying of the continent isolated the south-west from the remainder, and they never escaped from this south-west origin.

Similarly, realising that dryandras are specialised members of *Banksia* raises the interesting question: what happened when the first dryandra evolved from its *Banksia* ancestor, and why? Dryandras are highly successful - there are more species in the dryandra branch than in the rest of *Banksia*, and the dryandras appear to have colonised different habitats. Wondering how they did this makes the group more fascinating even than it was before.

**Science for science's sake?**

A common charge against taxonomists who make controversial name changes is that it's either 'science for science's sake' or done without consideration of the real world.

I believe that both these charges are false. Modem taxonomy is a science, and as in any science, taxonomic knowledge and understanding evolves. If our knowledge changes and the change can be debated and tested and found to be correct, then I believe we should accept it even if it's discomforting. The idea of any science sticking with a status quo just because it's comfortable and familiar is deeply troubling.

Instead, I urge the readers of this article to take onboard the new thinking. Dryandras are special banksias - and I think this makes them even more fascinating than they were before.

**Editor's Note:**

This article is based on an article that originally appeared in the *Dryandra* Study Group newsletter and has been reprinted, with permission from and with minor updates by Kevin Thiele, due to the significance of the proposed changes. SGAP members might like to obtain/peruse the excellent book: *The Dryandras* (September 2006) by Tony Cavanagh and Margaret Pieroni.

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# Plant Irony

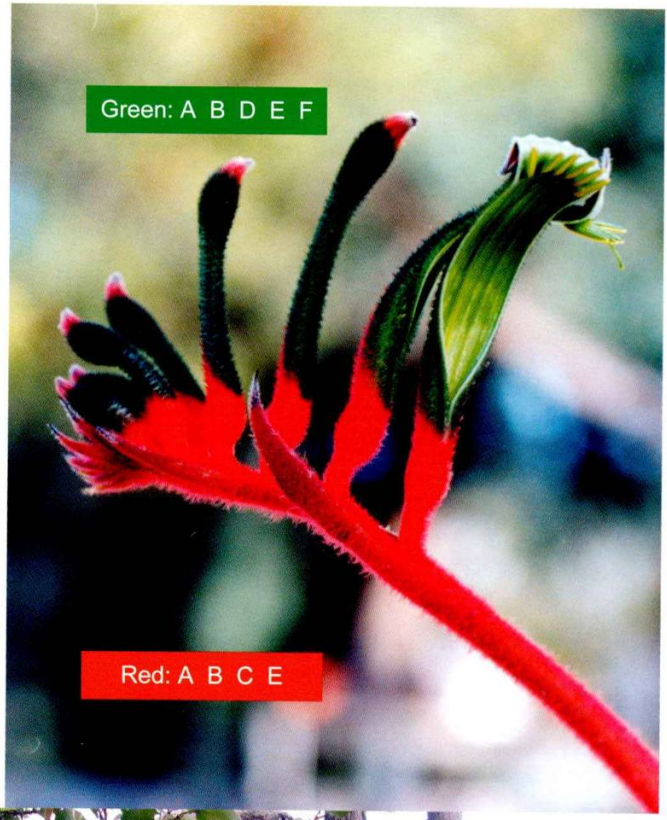
Noel Rosten

Mistletoes are hemi-parasites that take nutrients from the host, but do create some of their own energy via photosynthesis. The irony is, there are mistletoes that only parasitise other mistletoes (photo opposite). Mind you, it is still 'all bad' for the original host.

While botanising several years ago with Jenny Lewis (leader), Ross Doig, Pat Pike, and Barry Lees, members of the Hornsby Herbarium group, we found this unusual mistletoe *Notothixos subaureus* (Oliver Golden Mistletoe) halfway down the Bujwa Track, a fire trail leading from Cowan Oval. The host is *Dendrophthoe vitellina*, a common mistletoe that uses eucalypts as its host.

The view from this spot is outstanding and this is where Ross Doig's ashes were scattered after his unfortunate passing in December 2007. The photograph was taken on a return trip.

**Right:** Pigments identified in red and green flower hair cells of *Anigozanthos manglesii* - refer to page 166 for key.
Photo: B Tan




**Below:** Mistletoe *Notothixos subaureus* on host mistletoe *Dendrophthoe vitellina* which is on a host eucalypt.
Photo: N Rosten



# Everything Old is New Again

Thelma Vandepeer, St Peters SA

This article is meant to convey the changes to ones ideas when moving from a new garden to an old established area. Whilst restrictions on eventual height and width of plants did not matter so much at Tea Tree Gully, it was a major consideration here at St Peters. Thought has had to be given to watering restrictions, soil conditions and to drainage on the heavier soils. The photographs are meant to show the growth of the plants more so than the flowers.

After spending some 30 years gardening at Tea Tree Gully, north east of Adelaide, we decided it was time for a change.

When we purchased the Tea Tree Gully plot, approximately 2,100 square metres in size and situated on the banks of a winter flowing creek, it had not been developed or landscaped. With it we inherited an old wrecked car tyres, a goat, a stove and other junk. The indigenous vegetation consisted of ten large *Eucalyptus leucoxylon* subsp. *leucoxylon*, several *Acacia pycnantha*, *A. paradoxa*, *Bursaria spinosa*, one *Xanthorrhoea semiplana*, two *X. quadrangulata* and other smaller plants. The soil was a very poor, grey, sandy and gritty mixture that within a short period became non-wetting. Due to the slope of the creek banks and the large existing trees, drainage was not a problem. Trying to grow a wide range of Australian plants was going to be a case of trial and error.

Most Acacia species were no trouble to grow. Correas loved the dappled shade provided by the Eucalyptus leucoxylons and they grew within one metre or so of the Eucalypt trunks. Hakea species were happy after taking a while to settle in, but Melaleucas and Banksias were rather spindly and, pruning did not seem to encourage bushier growth. Introduced Pimelea species would not thrive even though a local Pimelea had been growing on the land. Calothamnus species grew with little attention and their habit of growth suited the slope of the creek bank. My favourites, the Grevilleas, could be temperamental and even grafted specimens could sulk for years without growing or dying.

On deciding to move in 2002, our criteria was for a house we both liked that was on a reasonable sized and fairly level block of land. The property should not include a swimming pool, a tennis court or any large Norfolk Island Pine. Hopes were dashed many times when on seeing the real estate advertisements for likely looking houses, we were to discover a pocket sized front gardens with box hedges and iceberg roses edging the paths, and with a back yards not much bigger. Finally however, towards the end of the year we found our new home, approximately four kilometres from the city.

The only native plants in the garden were a *Callistemon* species, a *Brachychiton* species and a Lillypilly. The side garden had an enormous Irish Strawberry tree (*Arbutus* species), since removed, a *Coprosma*, a privet and many other rather neglected shrubs. Two dozen standard roses were planted across the front of the house. Before starting to plant, we removed many trailer loads of bamboo, ivy, sword fern, privet, *Coprosma* and *Agapanthus* from the property.

Various soil mixtures appeared to have been added to the original since the house was built over 120 years ago. The mix ranges from quite light and almost sandy to quite heavy loam, the whole lot overlying a marl mix. All the garden is very well drained and has a gentle drop of about one metre from the back to the front of the garden. Most of the garden receives full sun. Whilst the south eastern boundary is shaded in the morning by a huge *Melia azedarach*, it too has full sun in winter. The south western side of the garden is shaded by the house in the winter.

A built up area on the northern side of the house that was previously planted with bush roses is now planted with Grevillea species. Some of these Grevilleas are grafted, some cutting grown, but all are doing well and pruning has already been necessary. Several species of Grevillea, which had not done well at Tea Tree Gully were dug up, repotted and not planted for over twelve months. These included *Grevillea sarissa* subsp *rectitepala*, *G. fastigiata* and *Grevillea plurijuga* subsp. *superba*. Most of these needed some treatment for chlorosis during the first twelve months after planting but have not needed further applications of iron.

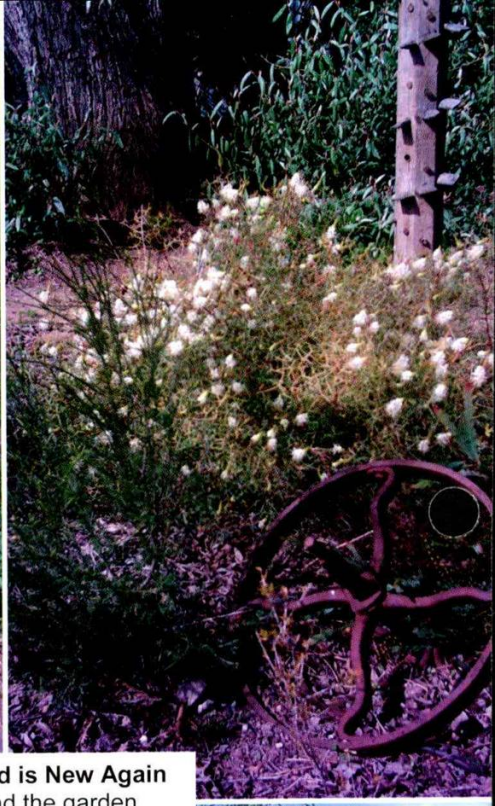
*Hakea* 'Winter Burgundy', *H. minyma* and *H. actites* are growing well, have flowered and have not needed treatment. *Hakea platysperma* and *H. bucculenta* have been given ferrous sulphate for chlorosis but another, *H. bucculenta* just a few metres away has not needed any help. *Eucalyptus caesia* subsp *magna*, *E. burracoppinensis*, *Corymbia eximia* (dwarf), *Eucalyptus kingsmillii* subsp *alatissima*, *E. erythronema* and *E. creta* are growing better now than on the lighter soils at Tea Tree Gully.

Correas and Prostantheras are thriving in the lighter soils under the *Melia azedarach*. This area is also home to potted native ferns and orchids. Since the front of this garden bed receives more sun than the other side, we have planted Thryptomenes, Scholtzias, *Olearia phlogopappa*, *Chamelaucium* hybrids and the semi-prostrate *Acacia glaucoptera*. All are thriving. Some *Melaleuca* species, *Indigofera australis*, *Grevillea leucoclada* and *G. stenomera* did need some application of iron but are now doing well. Removal of fallen flowers, leaves and fruit from the Melia is a constant job and, if left, makes the area look untidy.

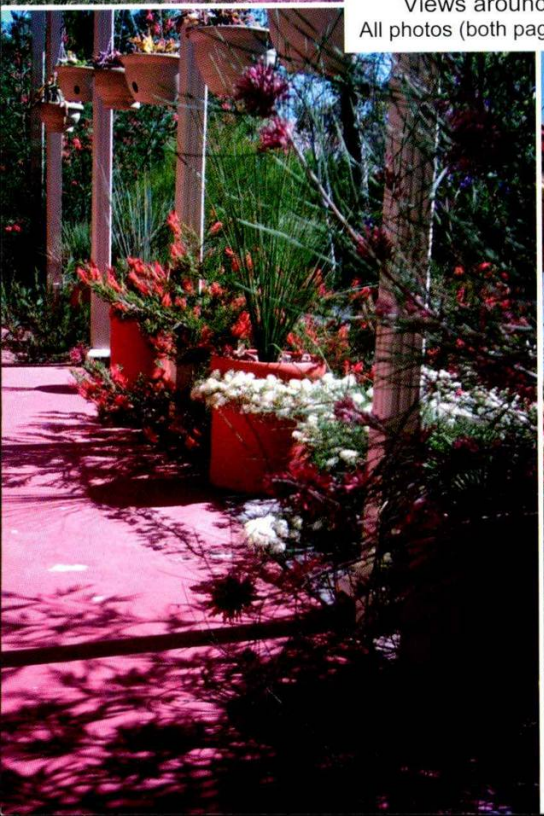
Recently we prepared a raised garden bed on the northern side of the house. We were curious as to whether or not *Verticordia* species would tolerate the alkaline soil. Because *Eremaea* and *Pileanthus* species were doing well in some areas, we thought it was worth trying, however the only successes so far have been grafted Verticordias.

We have been pleasantly surprised at the range of plants we have been able to establish in our new garden. Yes, some plants need applications of iron but with the exception of one area of the garden, this is no longer necessary. Other than watering and pruning maintenance, we will soon be able to stand back and admire our renewed garden from inside and from outside our beautiful new home. When asked if we regret moving from our former established garden into a new setting, I think we would both say "no, no regrets" although it was sad to leave a house we had built and a garden we had started from scratch. It was also sad to leave some of our beautiful and rare plants behind. It has been a lot of hard work starting again, but we think the effort has been worthwhile.

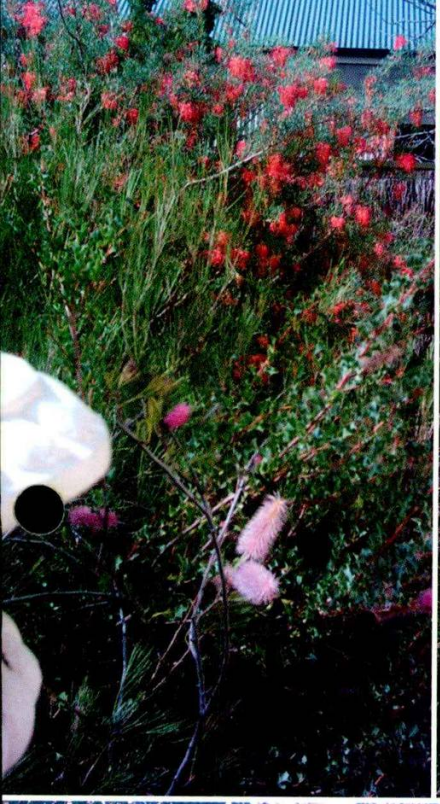




**Everything Old is New Again**
Views around the garden
All photos (both pages): T Vandepeer













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