AUSTRALASIAN PLANT SOCIETY
NEWSLETTER

PENTACHONDRA

ISSUE 42 MAY 2009



Acacias on the Algarve

AUSTRALASIAN PLANT SOCIETY

Newsletter Number 42

MAY 2009

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Corymbia ficifolia
Red- flowering Gum

EDITORIAL

Judy Clark

As always many thanks to everyone who sent contributions for this issue. Please keep them coming for the December 2009 issue. In particular it would be interesting to have more contributions on the impact of the UK of winter 2008-2009 on the survival of your Australasian plants to complement the articles in this issue (see pages 8 and 10-18). By then you will know whether any of those horridly ominous brown sticks have managed to stage a miraculous recovery, or really are dead. As well, or alternatively, you could take part in the winter hardiness survey.

I missed much of the cold of the winter just gone as I spent February in Melbourne visiting family. Instead I experienced extreme heat, including a maximum temperature of 46 ^{0}C on the day the worst bushfires seen in Victoria for at least 70 years began to burn in earnest, roaring through large tracts of land to the north and east of Melbourne.

Although February is probably not the best month for seeing Australian natives in their full glory there were still lots to be seen in flower. The bright pink, red and orange of *Corymbia ficifolia* (formerly *Eucalyptus ficifolia*) in full flower lit up more than a few suburban streets whilst in native gardens not only eucalypts but grevilleas, banksias, verticordias, eremophilas, kangaroo paws and everlasting daisies, to name but a few, were going strong.

I met up with former APS secretary Nicky Zanen who is now well settled back in Australia and we enjoyed a wonderful day visiting the gardens of Shirley Carne and Bob and Dot O'Neill. Shirley's garden, in Monbulk on the outskirts of Melbourne and where I took the photo on the back cover, is only 3½ years old, but to eyes used to British gardens the size of the trees and shrubs make it look as if it ought to be at least 10 years old, an effect reinforced by 'borrowed' mature trees on the boundaries. The photos on page 9 don't adequately capture this garden's artistry and variety, and I failed completely in my attempts to photograph one of the features that really make it: the repeat patches of *Wahlenbergia* mixed with blue and white *Brachyscome* daisies that link it all together. All I could manage is a close up of the double flowered *W. gloriosa* (see photo page 10). As we walked round Shirley kept snipping away, pruning to keep shrubs and trees shapely and paths clear, an everyday little and often task here in contrast to the bigger seasonal job it frequently is in Britain.

I had visited Katandra, Bob O'Neill's garden in Wandin (also on the outskirts of Melbourne), on my previous trip to Australia and it was great to see it again. Bob, who was the ABC's 'Gardening Australia' Gardener of the Year in 2005, is full of ideas and constantly experimenting. This

time it was his response to the severe drought which has gripped much of south east Australia in recent years. His 'bed of the future', as he described it, is mulched with coarse white sand and filled with dry area plants such as eremophilas and vertichordias. These only need a little water whilst establishing. He also introduced me to various species of *Zieria*, plants with lovely aromatic foliage related to *Boronia*; have any members tried growing them in Britain? Katandra is open to the public and the photos on the website (www.katandragardens.com.au) are better than any that I took. It is also the only Australian garden included in 'Inspirational Gardens' by Pamela Westford (AA Publishing, 2008).

Also extremely hospitable were Bill Aitchison and Sue Guymer, who I contacted because they handle book sales for the Australian Plants Society – Victoria (see asgap.org.au) which I joined a couple of years ago. Their garden in Donvale is different again. The planting of locally indigenous species merges the garden seamlessly into the bushland and creek behind it. I was interested to find *Hakea nodosa* there as I have this plant in my garden and I hadn't realised where it came from. (I may soon have to say 'had' it in my garden as it's currently copiously shedding its needle like leaves and looks quite ill).

From Bill and Sue I obtained a copy of the recently published 'Banksias' by Kevin Collins, Kathy Collins and Alex George (Bloomings Books 2008). This book tells you all you could possibly want to know about all 78 known *Banksia* species and their ecology and cultivation without using lots of technical language. APS members Sue Hyams, Tim Darrington, Rob Senior and Tony Parry are among those credited for providing information about banksia cultivation in Europe.

Returning to Britain, we have again organised three meetings for 2009; the AGM in Chester, a southern meeting and a northern meeting (see pages 3 to 5 for details). I would really encourage you to try and attend at least one of these meetings. It's not only that the venues are interesting (well we hope you will find them so) but that meetings are also a great opportunity to get to know other members, to talk informally and learn from each other, and to make new friends.

Another way to meet other APS members is to advertise your willing ness to welcome them by saying so in Pentachondra; just send me a note and I will include your details. In the meantime I would be delighted to entertain any members who happen to be passing by my bit of the south coast even if parts of my garden are rather a mess at the moment. Between my students, the allotment and Pentachondra it's got a bit neglected of late but I have plans and if you let me know you are coming I shall be given an incentive to implement them!

APS MEETINGS

AGM

Saturday 13th June 2009

The 2009 AGM will be held on 13th June at Chester Zoological Gardens, thanks to Mark Sparrow, Chester Zoo's Curator of Horticulture and Botany and an APS member, who kindly offered facilities there. The gardens should prove of great interest to members. Besides the Joseph Banks Garden, containing species collected by, named by, or named after Banks (see Mark's article in Pentachondra, May 2008, page 36) other gardens include an Andes Garden with plants native to Chile and Argentina and an indoor exhibit representing a Papua New Guinea rainforest. For more information on what to see and do go to the Chester Zoo website (www.chesterzoo.org).

For those hoping to make a weekend of it, Ness Botanic Gardens are only a 20 minute or so drive from Chester and APS members Amanda and Dennis Kershaw will be delighted to be at home on Sunday 14th for members wanting to visit their garden in Wallasey, about 45 minutes drive from Chester. Contact them on 0151 639 7611 for directions.

Arrangements

We will meet at the Zoo at 11am. Members should go to the entrance of the administration building, Cedar House, where Mark will be waiting at the reception desk to arrange entry for us. The AGM will be held in Cedar House and Mark will show us around the Zoo. There will be a break for lunch at around 1 pm. There are several restaurants and take away kiosks at the Zoo for those who don't want to bring their own food. The Zoo is completely wheelchair accessible and all toilet facilities have disabled access. However dogs are not permitted, except for assistance dogs. As special arrangements are being made for us to enter the Zoo please let the Secretary, Jeremy Spon (contact details inside the back cover of this newsletter), know if you are intending to come.

Directions

Chester Zoo is easy to reach by road and by public transport; further information is available on the Chester Zoo website, and from Traveline, 0871 200 22 33. However, we will not be meeting at the public entrances to the Zoo, but at the Cedar House entrance. Cedar House is located in Caughill Road off the A41 (Moston Road) and parking is available in the Cedar House car park. Make sure you go to the Cedar House entrance and not the staff entrance.

Southern Meeting

Saturday 9th May 2009

In the morning we will visit the National Pinetum at Bedgebury (www.bedgeburypinetum.org.uk) in Kent. Bedgebury was started as a joint project between Kew Gardens and the Forestry

Commission in 1925 but the Pinetum is now managed solely by the Forestry Commission. Today it covers some 192 acres and is the most comprehensive collection of conifers on one site in the world. Our guides will be curator Chris Reynolds and/or propagator Dan Luscombe, and the focus – obviously – will be Australasian species. This will be followed by an afternoon visit to Graham Blunt's Plant*base* Nursery (www.plantbase.co.uk) in East Sussex. Graham, an APS member, will have lots of interesting things to say about which of his plants survived the winter and which didn't. Please let Judy Clark know beforehand if you intend to come to this meeting (see contact details inside the back cover of this newsletter).

Arrangements

For the morning visit we will meet in the car park at Bedgebury. Members with plants and/or seeds to swap should arrive at 10 am or so to allow time for this before starting our tour at 10.30 am. This is expected to last for a couple of hours or so, after which we will break for lunch. There are plenty of places to picnic and a cafe which sells tea and coffee, soup, baguettes, sandwiches and cakes if you don't wish to bring your own food. We will leave Bedgebury at about 2.00 pm and go in convoy to Plant*base*, aiming to arrive at about 2.30.

Directions

If coming from the north, west or south make your way to the A21. From the A21 turn onto the B2079 which just north of Flimwell on the dual carriageway and is signposted to Bedgebury. If coming from the east or north east take the A262 to Goudhurst and turn south onto the B2079. The admission charge for Bedgebury is £7.50 per car so we may want to think about car sharing. For members who intend to come for the afternoon only the address is Plant*base*, Sleeper's Stile Road, Cousley Wood, Wadhurst, East Sussex TN5 6QX. Take the B2100 (Cousley Wood Road) which runs between Lamberhurst and Wadhurst and turn north onto Sleeper's Stile Road. More detailed instructions are on the Plant*base* website.

Northern Meeting

Saturday 5th September 2009

The 2009 northern meeting, organised by Tony Entwistle, will be held at the Quinta Arboretum at Swettenham near Holmes Chapel in Cheshire. This very beautiful arboretum was started in the fifties by Sir Bernard Lovell and is now owned by the Tatton Garden Society. It houses some 1500 species of trees and shrubs in an area of 28 acres. Apart from *Eucalyptus* there are few Australian species but there is an extensive collection of Hebes provided and managed by the Hebe Society, as well as much else of interest, and all in a beautiful setting in the Dane valley.

Arrangements

We will meet at 11.30 for coffee at the Swettenham Arms pub which is right at the entrance to the

arboretum. After an initial walk around we can have lunch and a drink in the outside garden of the pub where there are trestles and tables. You can bring your own sandwiches or you can buy them at the pub. If it is raining we will have to adjourn within the pub, where they will keep a place for us, as there is no indoor shelter at the arboretum. After this there will be time for further exploration of the arboretum and of the area beyond it which is managed by Cheshire Wildlife Trust, and for which stout shoes are required.

Directions
Please let Tony Entwistle know if you intend to attend this meeting (see contact details inside the back cover of this newsletter). He will send a map and instructions; the arboretum is in a remote part of Cheshire and not at all easy to find.

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APS NEWS

Membership

Judy Clark

On behalf of the Society I would like to extend a warm welcome new members R.A. Drodge, Mark Collins and Gabrielle Reynolds, and to Janet Miller who has rejoined us.

Since the last newsletter I have been advised of the death of member Peter Thomson. He was for many years Head of the Physiology Department at Kew and then ran his own nursery and established the Garden School. I never met him and know of him only through his books. I have on my shelves *The Self-Sustaining Garden* (1977), *The Looking Glass Garden* (2001) and the second edition of the classic *Creative Propagation* (2005), all of which I can recommend, especially the last of these which covers every conceivable method of propagation, every plant group and a huge number of genera including many Australasian ones.

2009 Seedlist

You can order seeds from the seedlist using the order form enclosed with this newsletter. It is still only £3 for up to twenty packets of seeds represents which represents tremendous value. That the APS can offer such a benefit to members is down to the hard work of our seed manager, Richard Christmas, for which a big thank you. If you would prefer an electronic copy of the seedlist email Richard at seeds@anzplantsoc.org.uk.

Pentachondra contributions

The deadline for the next issue is **1st October 2009** but you don't need to wait till then; any time will do. Please keep your contributions coming; they are what make Pentachondra such pleasurable reading. All types of items are welcome, on any topic that has

something to do with Australasian plants, and photographs or drawings to go with them will be much appreciated.
Articles don't have to be technical, and don't worry about whether you've got plant names right or not; your editor will check these. However, if writing about your own garden, or a garden you have visited, information on location, soil and climate is very helpful as it enables readers to judge whether they could grow the species you write about. Contributions can be any length and can be submitted electronically or as hard copy; if the latter, typed copy is preferred as there is less chance of errors creeping in. For where to send them see the editor's contact details inside the back cover.

Treasurer's notes

Tony Entwistle

2008 was a good year, despite some expected fall in income from subscriptions, thanks in part to Judy Clark's effort with newsletter. As you will note from the balances on the enclosed financial statement it was necessary to move some money from our reserve account and total APS funds have barely increased.

Looking ahead to 2009 it seems that we will continue to have to dip into our reserves as bank interest will virtually disappear and postage has increased. However reserves are more than adequate and I do not foresee a subscription rise for several years unless membership falls considerably.

Several members have now asked for standing order forms for future years. These will be sent out in due course but as I am expecting to be replaced as Treasurer at the AGM in June and so bank and account details may change I do not want to this now. Standing orders do not have to be sent to your bank until December.

If you receive a polite but firm reminder with this newsletter you are one of a number who have still not paid their 2009 subscription. If you have paid between my sending the list to Judy Clark and the publication of this newsletter then please ignore the reminder. But if you have not paid, and don't pay by the time of the AGM, then you will be removed from the membership list.

Letter from America #7, part 1

Helen Beaufort-Murphy

In the December 2008 issue of Pentachondra Judy Clark reported on the latest drop in the number of APS members and mentioned the possibility of changing the name of Pentachondra. I joined the APS in 1997 (shortly after I moved to St Buryan, Cornwall, from Peru) in response to a magazine article about Australian plants and the Australasian Plant Society. Maybe a similar (but current) article would attract new members? Is

there anyone among the members who could arrange such an article? I notice there is only one other APS member , beside myself, in the US. Regretfully, I have neither the connections nor the financial means to arrange such an article in an American magazine, although I imagine there are a lot of people over here who would join if they knew about our Society.

With regard to the name Pentachondra, I have tried to think of a suitable substitute that would be explanatory and catchy, without sounding tacky but so far nothing has come to mind. On the other hand, how about having a Newsletter with just the name of our Society? The various societies I used to belong to such as the Alpine Garden Society, the Royal Horticultural Society, the Heather Society and the North American Rock Garden Society simply have their society name as a masthead.

I would enjoy belonging to the APS regardless of what the Newsletter was called. I can, however, see that the word Pentachondra might sound strange or off-putting to some people. And with the current drop in membership the main object is to attract new members. Apparently Australia and New Zealand have become popular holiday spots for Europeans. And according to Pentachondra at least some of the British nurseries carry Australian plants. So a newsletter with a simple title and the geographic locations right up front on the masthead could attract individuals who had been to Australia or New Zealand for a holiday and were looking for plants similar to those they had seen while they were there.

I consider Pentachondra to be relatively informal, but botanically correct, with easily understood terminology, and lots of helpful growing information. I have also found members of the APS to be a very friendly group that is small enough to allow the members to get to know each other. In addition there is the annual bonus of 20 packs of seed that are always what they are listed to be, something that some of the societies to which I used to belong did not always live up to. In other words the APS is the perfect small group of friendly fellow plant enthusiasts.

Changing the subject, I am still looking for seeds of *Rhabdothamnus solandri*, a Gesneriad that is endemic to the North Island of New Zealand. It is very attractive with orange or yellow flowers. I grew it when I was in graduate school and would like to grow it again. I am also particularly interested in obtaining seeds of *Citriobactus pauciflorus, Eustrephus latifolius* and *Boronia heterophylla*. Does anyone know of a source for them?

Jeff Layman's report on *Sophora microphylla* (Pentachondra, December 2008, page 24) brought back many happy memories of my work in Chile. I always made it a point to try and get books on the botany and archaeology of each of the countries in which I had projects. Consequently I have two floras covering trees of Chile and when I saw Jeff's article I

immediately got out 'The Tree Flora of Chile' (1983) by Professor Roberto Rodriguez of the Universidad de Concepcion. According to this flora there are three *Sophora* species in Chile: *S. fernandziana*, an endemic from Isla Mas, *S. toromiro*, an endemic of Easter Island, and *S. microphylla*. The flora is a large handsome volume with exquisitely coloured illustrations of the species.

I really enjoy reading the reports in Pentachondra and seeing the photos of the plants, and I very much regret that I do not have the opportunity to meet other members or see their gardens. I would particularly enjoy seeing the gardens of those who contribute to Pentachondra as well as the gardens that are visited during the annual meetings. Therefore, would it be possible to occasionally have a simple sketch of a garden plan with a photo of a favourite view of a garden?

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WINTER REPORT FROM HORSHAM

Jeff Layman

A real winter at last. I have only just bought a recording weather station, so the temperature figures I have are from memory.

We had more than a dozen nights below -3°C, 5 or 6 below -5°C, and the lowest temperature was -8°C. On only one day the temperature never got above 0°C, and we had, in total, about 10 cm of snow. According to an acquaintance who lives about a kilometre away, the ground was frozen solid for 15 to 20 cm down.

Nonetheless, most of the Australian plants outside seem to have survived well.

No protection

The following plants were unaffected: *Banksia serrata*; *Callistemon viridiflorus*; a *Callistemon* species (possibly *C. phoeniceus*, perhaps some very minor damage to the most exposed branch tips); *Eucalyptus kitsoniana*; *Grevillea rosmarinifolia* (this is possibly a hybrid) and another very similar plant with slightly softer foliage; *Grevillea* ?*barklayana* (definitely a 'toothbrush' Grevillea but perhaps not *G. barklayana*; see photo page 10); *Hebe salicifolia* var. *angustifolia*; and a couple of phormiums.

On a south-facing fence

Callistemon 'Father Christmas', *Callistemon sieberi*, *Carmichaelia stevensonii*, *Eucalyptus archeri*, *Eucalyptus rodwayi*, *Griselina littoralis* 'Variegata', *Hakea microcarpa*, and a *Pittosporum* species were all unaffected. Some damage was suffered by my (Chilean!) *Sophora* 'Sun King' which lost all the leaves and flower buds from many of its upper unprotected branches. However branches below the fence top appear unaffected, as both leaves and flower buds remain.





Shirley Carne's Melbourne garden, February 2009



***Wahlenbergia gloriosa* in Shirley Carne's garden**



"Definitely a 'toothbrush' Grevillea but perhaps not *G. barklayana*"

On a south-east or south-west facing wall
A *Callistemon* species (probably *C. rigidus*), *Lophomyrtus* x *ralphii*, a *Melaleuca* species (probably *M. violacea) and Pittosporum tobira* were unaffected. C*lianthus puniceus* lost leaves and flower buds where these were exposed to the cold wind, but other leaves and buds appear untouched. *Melaleuca lateritia* has some damage to the lower leaves but strangely not to the leaves near the ends of its branches. *Solanum laciniatum* looks dead, but as this plant is around 6 years old it may well have come to the end of its life anyway.

In the greenhouse, I lost *Dryandra formosa* and a *Banksia occidentalis*. These have been around for a few years, and the greenhouse is frost-free. It took me a while to work out why they died. It was because they were in the warm air flow of the fan heater which keeps the greenhouse warm, and had dried out. I keep the watering to a minimum in winter, and although this had worked well in previous milder years, paradoxically this very cold winter meant that the fan heater was on a lot more. I had forgotten to increase the watering to compensate. Other dryandras and banksias (including *B. occidentalis*) which were not in the air flow survived without additional watering.

Of course, the true picture will not emerge until later in spring, when perhaps some of those plants which seem to have survived will keel over when growth starts.



A LESSON IN LOCAL CLIMATES: Australasian plant survival (or not) during the winter of 2008/09 in coastal west Wales

Graham Sumner

As I write, on the last day of February 2009, winter is drawing to a close. My wife and I are fortunate in that most winters we spend several weeks with other 'similarly-aged people' in the Algarve. As we left early on the 3rd January, the temperature in our home town of Aberaeron on Cardigan Bay was -6˚C. During our absence the weather first became milder, and then even colder in late January and early February. We returned in mid-February to deceptively spring-like conditions, just right for assessing damage and clearing up the garden. I have just completed the sad task of making an audit of survivals, deaths and doubtfuls amongst my Australasian plants. I also now have a very large amount of (mostly Australian) garden waste!

Gardeners always take risks, particularly if they are attempting to grow Australasian plants! The past 11 years of winters have spoiled us. My garden is in the

centre of the town, near the harbour, a mere 200 metres or so from the open sea. Most would assume that we rarely have frost, but they would be wrong. Aberaeron has a local climate with an occasional sting in its tail which may deliver exceptionally low winter temperatures when meteorological conditions are right. Being at the mouth of a narrow and quite deep valley means that we often experience 'katabatic winds', cold air draining down the valley towards us. If high pressure becomes established during the winter, with light or non-existent larger-scale winds, this rush of cold air spreads out, slows and may stagnate over the town (which is effectively on a river delta near to sea level). Whilst the high pressure persists the temperature of this cold pool will often gradually reduce as it deepens and more cold air is added. The long, clear anticyclonic nights will further cool the ground beneath the air. Night-time temperatures which are unusually low for a coastal location on the west coast may then occur. Even if the intervening days are sunny, the sun is too low and weak to warm the ground surface and help disperse the cold air. Adjacent cliff and hill tops and flanks are generally a lot less cold.

With 25 years of attempting to grow Australian plants in Aberaeron, I have come to appreciate what one or more nights below about -5˚C can do. The last time this happened was, once, during the winter of 1995/96: -9˚C, the coldest I have recorded in those 25 years. That cut my quite large and old *Callistemon citrinus* to the ground, although recovery the next summer was rapid. The winter just gone gave my plants several doses below -5˚C. The exact number is unknown because I was away for six weeks. The lowest recorded temperature during that period was -7.6˚C. Aberaeron's sometimes harsh local winter climate has been known to produce daytime temperatures which remain below freezing for a few days at a time. This may have happened this winter during the late January and early February cold spell, because even having experienced temperatures below -7˚C prior to our departure in January, my quite large wattles (*A. melanoxylon* and *A. dealbata*; each about 3 metres tall) were looking perfectly healthy. They are now brown blots on my otherwise evergreen garden! Having said that, the main stem and larger branches when gently rubbed show green sap just below the surface, so there is perhaps hope. As an illustration of the localness of local climate, a friend with *A. melanoxylon* of the same progeny, who lives only 20 km away along the coast but at a higher altitude overlooking Cardigan Bay, reports his specimens as undamaged.

The Met Office's forecast for this winter had suggested that temperatures would probably be below the average. Of course, we have not even had an 'average' winter for several years! We've become soft. These forecasts relate to the long-term temperature and precipitation for the season. I would guess that for the whole

three months of winter, the forecast was about right. Time will tell. The trouble is that with our climate there can be huge fluctuations above and below the average. This cannot be indicated in a seasonal forecast. I wouldn't mind, but I remember defending the Met Office's forecast of the winter two years ago in a previous article ('Australasian Plants in west Wales and the winter of 2005/6. Media hype and the *actual* forecast')!

My survivals, probable survivals, probable losses and near-certain deaths are listed on the right. Every cloud has a silver lining, we're told. I had been planning to open out the garden this spring as it was becoming very crowded. Nature has started the task for me. I shall be more cautious from now on; well, for a year or two anyway. My *Callistemon citrinus* has survived though, and is only a little damaged. Clearly, several nights at around -7˚C are OK as far as it's concerned, but not one night at -9˚C! Whilst my garden was suffering, though, the wattles in the Algarve were blooming beautifully (see photo on the front cover). Whatever did southern Portugal look like before Australian plants were introduced?!

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ACACIA UPDATE

Jeremy Spon

A couple of years ago I wrote about some acacias which I was growing outdoors, or thought

West Wales species survival or otherwise

Survivors, undamaged
Acaena microphylla
Callistemon linearis
Callistemon pallidus
Callistemon rigidus
Callistemon viridiflorus
Drimys lanceolata
Eucalyptus archeri
Eucryphia milliganii
Leptospermum lanigerum
Olearia macrodonta
Pittosporum crassifolium
Podocarpus alpinus

Some damage
Callistemon citrinus
Corokia cotoneaster
Correa 'Marion's Marvel'
Eucalyptus leucoxylon 'Rosea' (in large tubs adjacent to house)

Extensive damage
Acacia pravissima (an unhealthy specimen anyway)
Dicksonia Antarctica (some fronds still green, but very few)
Eucalyptus coccifera (to epicormic regrowth – the main stem was cut down summer 2008)
Libertia grandiflora (some clumps OK; others, leaves brown and flattened to ground)
Sophora tetraptera

The jury's out
Acacia dealbata
Acacia melanoxylon

Probably gone
Acaena inermis 'Purpurea'
Grevillea robusta
Leptospermum scoparium
Livistona australis
Pittosporum undulatum
Syzigium oleosum (in pots; these survived temperatures down to -4˚C but not below)

might survive outside (Pentachondra, May 2007, page 25). Since we have just had the most severe winter since my wife and I moved to East Kent in 1999, I thought it would be appropriate to report on how the plants fared, together with some other acacias I have grown since. To put this in context, I should say that we had two spells of cold weather, with lying snow, and a minimum temperature of -8º C on more than one night. There were also one or two days when the temperature did not rise above freezing. I realise that this would not represent severe weather for many parts of the country, but I cannot recall worse in Kent since the late 1980s.

Sadly, the effects in general were quite damaging, but I will start with the good news. *Acacia boormannii*, which I think is a particularly attractive plant, seems to have escaped with just a little scorching of the phyllodes, and the loss of a few flower buds. I might be premature, as I am writing this in late March, and I know that deaths can occur from winter damage well on into the spring, but it looks as if this is the hardiest of the acacias I have tried outdoors.

A. filicifolia, which previously had been untouched by frost, has had all its leaves killed, and looks very sad. The main stems have not split however, and show some green under the bark, so it may regrow. Curiously, *A. pravissima*, which I would have expected to be hardier, has definitely been killed, the bark split to ground level. Even more curious is the fact that a plant in a garden a few miles away, which is in something of a frost pocket, seems to have survived unscathed, and is just coming into flower. Two possible explanations for this discrepancy occurred to me. One was that the plants were from different provenances, and mine came from seed of plants from milder areas. The second was that my plants were mis-identified, and were actually a similar species, *A. cultriformis*, which is considered less hardy. I sent leaves and a description of the plant to Jeff Irons, who confirmed the identification as *A. cultriformis*; the moral being, don't trust labels on seeds or plants, but look closely at everything you grow!

The unidentified acacia grown from seed collected in Corfu died to the ground during its first winter outside, and although a few shoots did appear during the summer, these did not survive. Also killed in the winter before last was the one tentatively identified as *A. melanoxylon*.

A. dealbata, which I mentioned grew to a great size in Sittingbourne, seems to have lived on in the form of a seedling or cutting in the same garden. Although Sittingbourne is probably kept slightly milder than Canterbury by the proximity of the Thames estuary, as the current plant is just coming into flower, this species remains a possibility for a very sheltered site. Having said that, two plants in a garden where I work, which were about 6 feet tall, both seem to have died. This may well be a case of

provenance - I know the two plants in question were obtained via a national newspaper offer, so could have come from more tender stock.

Since writing the last article, I have grown several more species from seed, but have lost many of the plants in this last winter, despite the shelter of an unheated greenhouse. These included *A. mucronata, A. retinodes, A. acinacea* and *A. podalyrifolia*. Seedlings of *A. filicifolia* from my own seed also succumbed, suggesting that, unsurprisingly, small plants are less hardy than large ones. However, the shelter of the greenhouse did prove sufficient to keep alive two larger plants of *A. longifolia* and *A. melanoxylon*. The thermometer in the greenhouse registered a low of -8°C at some time during the winter. I imagine this will have been more fleeting than outdoors, and I doubt the pots froze as they were kept quite dry. So I may try these species outdoors in the future, perhaps trying to find a more sheltered spot. I certainly will not stop experimenting with Australian plants, despite my losses over the last winter.

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WINTER SURVIVAL

Judy Clark

Where I live on the south coast of England the winter of 2008-2009 was the coldest for over 20 years and like Graham, Jeff and Jeremy. I too experienced losses of some Australasian species after the prolonged cold of this winter but what I found particularly interesting was to compare their experiences with mine.

For example, a 3m tall *Acacia melanoxylon* in my garden survived without any damage whatsoever and is flowering as usual, but Jeremy lost his whilst Graham's may or may not recover. Graham notes that an *A. melanoxylon* of the same provenance as his survived undamaged at a higher altitude nearby so it may be that temperature differences at least partly explain the differential survival. I live on the coast and so would expect minimum temperatures to be a little higher than In Jeremy's inland garden, and being on the top of a hill I don't experience the sort of conditions described by Graham. But as I only have temperature records for January 2009 (during which the minimum recorded was -5.4 ^{0}C on the night of January 6/7) I can't be sure temperatures were just that little bit higher in my garden.

Ross and Irons ('Australian Plants: a guide to their cultivation in Europe', 1997) suggest that the 'danger zone' for *A. melanoxylon* could be -8^{0}C to -12^0 C, the higher temperature being where damage starts to occur and the lower temperature being where even well established plants are killed or cut to the ground. This assessment seems consistent with the evidence from last winter, though death is perhaps surprising. But provenance could also be relevant. The seed source for my plant was

my brother's garden in the Otway Ranges in Victoria where overnight frosts are a regular winter feature, though not prolonged cold.

Another example is *Melaleuca lateritia*. My two year old plant was planted out in the garden in June 2008. Unlike Jeff Layman's plant mine suffered almost no damage and is growing well, again consistent with my garden being slightly warmer. However a plant from the same batch of seed, planted out in April 2007 at a year old, had died after the very mild winter of 2007-2008. At the time I wondered if this was because M. *lateritia* could not tolerate any frost, but now I suspect its death may have been related to wind exposure. It was planted against a low south east facing wall which, although providing full sun, meant it was more exposed to the wind than the one that survived last winter and which is in a less sunny but more sheltered part of the garden.



Melaleuca lateritia

My third example is *Banksia serrata*. Whereas Jeff Layman's plant survived mine (which I think was given to me by Jeff) seems to have died; it is very brown and I can't see any green sap below the surface, though I live in hope. If it has died then the reason could be that it was not well established enough to survive the cold. It was only planted out in August 2008 having spent the previous two winters in a pot in my just frost-free greenhouse.

What these comparisons illustrate, as indeed do all three preceding reports, as well as those by Tony Entwistle (page 17) and Helen Beaufort-Murphy (page 23), is that while temperature is important to winter survival other factors, or combinations of factors, may well also be involved. Just because a plant dies after a cold winter it doesn't mean that it was the cold, or just the cold, that killed it. It may have been old, or not very healthy in the first place.

Nonetheless, the winter just gone does offer an opportunity to obtain some systematic information about the hardiness of Australasian species from APS members. To that end I have devised a survey. It draws unashamedly on the RHS winter hardiness survey (www.rhs.org.uk) but there are important differences and anyway it would be good to have our own evidence.

The box on the next page lists the information I would like. Alternatively I can supply a form to complete, either electronic or hard copy (see contact details inside back cover). I will hope to collate responses for the December 2009 issue of Pentachondra.

APS Winter hardiness survey

Information required

Garden information: Location (urban, suburban or rural); soil type including any modifications; altitude; aspect; prevailing wind

Weather information: Any details that you have concerning maximum and minimum temperatures and amount of snow between 1 December 2008 and 28 February 2009.

For each plant: Please use the numerical key below and feel free to add extra information

Name of plant: Indicate if any uncertainty as to correct identification

Level of damage: 1 killed; 2 cut to the ground but recovered; 3 cut back (loss of leaves, twigs or small branches); 4 uninjured

Location: 1 against house wall; 2 against other wall, fence or hedge; 3 sheltered by other plants; 4 fully in the open.

Degree of artificial protection: 1 fleece; 2 bubble wrap; 3 straw; 4 gravel mulch; 5 other; 6 none

State of plant: 1 mature plant (more than 10 years in current position); 2 younger plant (2-10 years in current position); 3 planted out during 2008; 4 in a pot

Provenance of plant: 1. Australian seed (indicate geographic area if known); 2. seed of unknown provenance; 3. purchased plant (indicate source if known)

Even if you cannot supply all the information requested your response will be useful.

FATALITIES IN CHESHIRE:

Tony Entwistle

The arctic weather of December and early January has been a problem. The cost of heating has soared and I have two polytunnels with small paraffin heaters which I light when the temperature falls below -3^0 C. The cost of paraffin is now up to £6 for 4 litres and I used more in 6 weeks than during the whole of the winter of 2007-2008. Sometimes I wonder if our enthusiasm really is Sisyphean (look it up in your dictionary).

Some plants are good temperature indicators. I watch a *Euphorbia mellifera* outside my study window and its leaves drop vertical at exactly -2^0 C.

Callistemon species that have proved tough and hardy here in Cheshire are *C. subulatus*, *C. linearis*, *C.pityoides* and *C. rigidus*, but not *C. citrinus* and its cultivars. There are over 100 named cultivars and their

individual hardiness here must be considered experimental as their origin is complex.

Species lost that were kept permanently outside

Abutilon megopotamicum
Acacia dealbata
Acacia shuttleworthii
Aciphylla hectorii
Anigozanthus flavidus
Banksia oblongata
Billarderia longifolia
Callistemon salignus
Dodonaea viscosa
Epacris villosa
Grevillea victoriae
Grevillea juniperina var. *sulphurea*
Grevillea "Apricot Delight"
Grevillea "Robyn Gordon"
Grevillea "Rondo"
Grevillea "Mount Tamboritha"
Hakea sericea
Kunzea baxterii
Lomatia ferruginea
Mutisia ilicifolia
Olearia phloggopappa
Olearia phloggopappa "Comber Blue"
Olearia phloggopappa "Comber Pink"
Olearia semidentata
Prostanthera rotundifolia
Solanum laciniatum
Westringia angustifolia
Weimannia trichosperma
Wachendorfia thyrsiflora

Anyway, in a rather despondent mood, I made out an 'RIP' list of all the southern hemisphere plants I have had as established plants, not seedlings, and lost over 20 years. The size of this list – see the two boxes - surprised me. I have only replaced a few. The causes of death were often a mystery, rather than just being due to winter. No doubt there will be more fatalities to add when spring comes.

Species lost that had some protection

Anigozanthus manglesii
Bellendena montana
Callistemon citrinus and cvs
Callistemon polandii
Chorizema ilicifolia
Crowea angustifolia
Calocephalus brownii
Chamalaucium unciniatum
Darwinia taxifolia
Diuris "Earwig"
Hakea clavata
Lecenaultia formosa
Lechenautia biloba
Hibbertia aspera
Hibbertia scandens
Hymenosporum flavum
Ptilotus obovatus
Prionotes cerinthoides
Protea barbigera
Rhododendron laetum
Rhododendron lochiae
Rhododendron mcgregoriae
Rhododendronzoelleri
Tetratheca ciliata
Telopea speciossima
Telopea truncata
Trochetiopsis ebenus
Verticordia plumosa

Why not write something about your winter survivors, or anything else for that matter, for Pentachondra? The deadline for the next issue is 1st October March 2009.



APS president Jeff Irons with *Cordyline indivisa*



***Cordyline indivisa*, Castlewellan Arboretum**



Copy of the original illustration in IllustrationsHorticole from 1860

Cordyline indivisa **in flower**





Cordyline indivisa, **showing growth points on trunk**



***Macrozamia reidleri*, female with cones**



***Macrozamia reidlei*, Kings Park, Perth**

Letter from America #7, part 2

Helen Beaufort-Murphy

Here in central Piedmont in North Carolina we expect frosts from mid-October to early May so all of my Australasian species are kept in the greenhouse during this period. On rare occasions the temperature gets down to 0 ^{0}F (about -21 ^{0}C) in January or February though the usual low is closer to 5 ^{0}F (about -15 ^{0}C). The lowest night temperature so far this winter was 8 ^{0}F (about -12 ^{0}C) with high winds. Can any members suggest Australasian plants that might survive under these conditions?

In 2005 I sowed seeds of over 40 species, 19 of which germinated (see Pentachondra December 2005 for details) but since then I have lost a lot of plants due to circumstances beyond my control, including failure of my greenhouse heating. I have an automatic propane gas heater that usually works without any problems. But on a 24 ^{0}F night (about -4 ^{0}C) in December 2007 it did not come on because I'd had it serviced that day and the service man had forgotten to turn the thermostat back on! Then in April 2008 we had frosts of about 20 ^{0}F (about -7 ^{0}C) for two nights running and the heater stopped without my knowing about it until the third day. The service man found a dead wasp in the pilot valve! By this time most of the seedlings and more of the older plants were dead.

Some of the species I was particularly sorry to lose included *Acacia costiniana*, which is a most attractive small *Acacia* with wavy edged foliage. It had grown slowly but steadily and died following the loss of heat in the greenhouse. So did the last *Alogyne huegelii* and my only plant of *Mutisia ilicifolia*, neither of which had grown well. The entire pot of *Arthropodium strictum* plants, which had been growing extremely well, also died from loss of heat.

A number of plants (all but two started from seed in 2005) have proved much tougher than I expected and are still alive despite the three nights without greenhouse heat in winter 2008. These include the following.

A plant of an *Acacia* species that was grown from seed collected by Jeff Irons in Yemen had been growing very slowly but started to grow rapidly after I tried Maxsea seaweed fertiliser on it last summer. It soon reached more than 5 ft and I cut it back to 3 ft in July in order to get it into the greenhouse for over-wintering. It is now (January 2009) a nice bushy plant with attractive small grey-blue lacy foliage. Maybe it will flower this coming spring?

(The Maxsea fertiliser I put on all the plants in containers in 2008, including the remaining Aussie plants, with excellent results. The various Gesneriads flowered the best in many years. I applied it every two weeks but to be on the safe side I used it half strength. I plan to try it on a sample of the

seedlings this year and will report on the results in a future issue.)

Carpobrotus rossii seedlings started from seed in 2005 were planted out into a new raised bed in full sun, in May. The plants grew rapidly and made an attractive mat, 3 ft wide with tight succulent leaves but they did not flower. *Pandorea jasminoides* (purchased, not grown from seed) is one of my favourite Aussie species because it flowers from late spring to early autumn so long as it has full sun, copious water, and regular fertiliser. *Calostemma purpureaum* was not grown from seed. Jeff Irons sent me the original bulb and it had flowered each August since 2002 until it split into three small bulbs in 2006, since when it has not flowered. But now I have three large bulbs and am hoping for lots of flowers in August. *Arthropodium ciliatum* is a large healthy plant. It has not flowered yet but I hope it will do so in the near future.

CORDYLINE INDIVISA

©Gary Dunlop

Cordyline indivisa is the most sub-tropical looking cabbage palm from New Zealand, though of course it is not a member of the palm family but, perhaps rather surprisingly, a member of the Agave family. Despite being introduced into cultivation in England almost 150 years ago, it is not so widely known or grown as the almost ubiquitous *Cordyline australis* of coastal areas around the British Isles, which was introduced to cultivation several decades earlier.

Under the name *Dracaena indivisa,* the species was first described by the Prussian Johann Georg Forster, in 1786,[1] who, along with his father Johann Rheinhold Forster, had accompanied James Cook on his second voyage around the world, as the official naturalists. The name was changed to *Cordyline indivisa* by Endlicher in 1836,[2] when he established the new genus, as separate from the more tropical plants in Dracaena.

It is not clear when *Cordyline indivisa* was first introduced into cultivation, but a specimen which must have been several years old and which was put up for award in 1860 by John Standish of the Sunningdale Nurseries in 1860, received an FCC from the RHS.[3] Ambroise Verschaffelt, the editor of L'Illustrations Horticole based in Ghent, was quick off the mark and published the first illustration of Standish's plant, in colour (see page 20), the same year.[4] It shows a plant about 2-3 years old. Presumably the editors of Curtis' Botanical Magazine preferred to wait until the flowers could be illustrated before describing the plant, which it finally did in 1922 from material supplied from Mount Usher Garden in Co Wexford, to the south of Dublin, by Mr Walpole.[5]

Cordyline indivisa is a woodland plant growing at higher elevation that *C. australis* and thus should

be relatively hardier than its more common relative, though plants from the north Island may prove less hardy. However, as Lawrie Metcalf mentions, *C. indivisa* "being a plant of high rainfall regions and growing in cool mountain forests which are often surrounded in mist, it demands a cool rather shady position in the garden."[6] It has an extensive natural range "growing naturally in the high country sub-alpine forest from te Aroha to Banks peninsula and Fiordland. In the North island it grows abundantly in the rain forests of the Ohakune and Mt.Egmont." [7] It grows down to sea level at the Otago fiords in the south of the South Island.[8]

Cordyline indivisa as its specific name implies forms a stout single-stemmed tree, with a normally un-branched head [9] of pale green leaves, radiating from the top of the trunk which can be up to 1.8m long and 15cm wide at the base, gradually tapering to a point. The conspicuous central vein is orange, with many finer orange veins running the length of the leaves, though these are less conspicuous on the glaucous undersides, or even on the upper surface from any distance. The maximum height of the tree is about 8m, though 6-7 m is more common in cultivation when the plants are not drawn up in dense woodland. The height measurements generally seem to be to the tip of the utmost leaves, rather than the top of the trunk. The leaves are evergreen with the older leaves persisting for several years before dying and turning brown as the sap drains from them. During their senescence they gradually droop before finally hanging vertically beside the trunk. At this stage they can be fairly readily removed with a downward tug, starting with the lowest one, as the base of the leaves overlap one another where they attach to the trunk.

Some people may consider the plant to be at its most exotic looking, at about 5-6 years old and about 2m tall, with several years of foliage radiating out in an almost spherical shape, with the oldest leaves touching the ground, but the young trunk still disguised by the attached foliage. It is only at this stage that a fleeting resemblance to an *Agave* could be imagined, though one without succulent leaves. There is such an illustration in the Encyclopaedia of New Zealand Plants.[10] As is often the case, the size or scale of a plant is difficult to judge from photographs, but the accompanying photograph (see page 19) with Jeff Irons the President of the Australian Plant Society along side, provides a good sense of scale.

Several plants may have been raised at the time of the original introduction of *C. indivisa*, though perhaps more likely, there was a subsequent introduction soon afterwards as two nurserymen, Mr B.S.Williams and Mr J. Burley both exhibited specimens at the horticultural exhibition of 1869, as part of displays of stove foliage plants, and Mr Williams put on a similar display the following year.[11] It is likely these early introductions did not survive for long in cultivation, apart from

apparently being treated as stove plants, *C. indivisa* resents being pot grown for any length of time. One plant is known to have survived in the open at Tresco Abbey in the Scilly Isles and first flowered in 1895.[12] It was apparently first recorded as growing at Tresco in 1853. [13] The original specimen there is thus probably the first introduction into the British Isles, though it may have been part of the same batch from which Mr Standish's received the award.

The various species of *Cordyline* were easily confused both in cultivation, and by botanists, from an early date. In 1859, the German botanist Eduard von Regal published a description of *C. indivisa* in Gartenflora, which turned out to be *C. australis*. Mr Lee of the Vineyard Nursery obtained an AM from the RHS in 1864 for *C. indivisa* which was later correctly identified as *C. banksii*. Later, around the turn of the century, various periodic notes and illustrations in the Gardeners' Chronicle indicated the degree of confusion that still existed amongst the species in cultivation, with a large clump of *C. banksii* growing in Torquay in 1901 captioned *C. indivisa*,[14] but some weeks later it was correctly identified by Mr S.W.Fitzherbert. A row of mature *C. australis* at Abbotsbury Garden was also captioned as *C. indivisa* but corrected. This confusion was finally resolved with the first publication of a photograph of a 7 year old plant of *C. indivisa vera* growing in Castlewellan Arboretum, published in 1904 in

The genus *Cordyline*

The genus Cordyline was established by Antoine Jussieu in his Genera Planatarum in 1789, based on a herbarium specimen collected by Philibert Commerson, but, as with Philesia and other genera which he named for the first time, he did not name any species in the book. The first species in the genus was an Australian species named as *C. cannifolia* by Robert Brown in his Prodromus Florae Novae Hollandiae et Insulae van-Diemen in 1810. That species was subsequently reduced to a variety *C. terminalis*, by Baker in J. of Linn. Soc. Bot in 1875, which Kunth had named in Abh. Acad. Berlin, in 1820, thus becoming *C. terminalis var. cannifolia*, but it later reverted to its original specific name, *C. .cannifolia* before being changed to *C. objecta* in 2006, whilst *C. terminalis* is now *C .fruticosa*.

Several other names have been applied to *C. .indivisa; C. hookeri,* Kirk 1874, *C. hectori* Colenso 1893, *Charlwoodia indivisa* Don 1830 and *Terminalis indivisa* Kuntze (1801).

Convolutions of name changes in botany are nothing new, but in the early days of botany a variety of names and descriptions for plants were published and this inevitably took some sorting out.

The Garden,[15] and again as a supplementary illustration to Gardeners' Chronicle in 1907.[16] The suffix 'vera' was apparently added by Mr Burbidge of Trinity College Gardens Dublin, who obtained the seeds from New Zealand supplied some to Lord Annesley at Castlewellan, to emphasise that they were the true species.[17] The following year, a photograph, by Mr Fitzherbert, of both *C. australis* and *C. indivisa* growing in proximity to one another was published,[18] thus removing any further confusion between the species.

In reasonable growing conditions, *C. indivisa* takes about 20 years to approach its typical full height in cultivation, of 5-6m. At this stage one or more additional growth points can sprout from the base of the trunk. These will start to grow into additional trunks, as the head of the original tree gradually weakens and eventually dies. In time, after several generations of this process, the tree forms clumps of full height trunks as is evident in the several venerable plants at Castlewellan Arboretum (see photo page 19), which are just over 100 years old, and may include the champion specimen in the British Isles.[19] Trees measured there are considerably taller at 7.5m than the other one mentioned at Glendurgan at 3m tall. There is however, a possibly even taller specimen at Mount Stewart .

It is not clear how many years it takes before *C. indivisa* first flowers, but it is likely to be when the tree approaches it maximum height, though it is reputed to be shy to flower. It may be that each trunk may only flower once. The flower spikes when they do appear and flower (see photo page 21), are quite distinct from the open and upward pointing inflorescences of both *C. australis* and *C. banksii*. Unlike all other species in the genus, the inflorescence is very dense and droops downwards close to the trunk, similar to some true palms. The flowers are described as perigones; that is, in which the perianth is not clearly differentiated into a calyx and corolla. They are purplish externally, and white internally suffused with green and lilac, and when fertilised mature to form purplish blue berries. John Salmon has published a good close up photograph of the flowers,[20] and another of the spike in flower.[21]

C. indivisa has a fairly compact root ball and probably makes new roots annually like some other New Zealand genera, such as *Phormium*. Reasonably mature specimens can be moved successfully, as was undertaken many years ago at Mount Stewart Garden with several specimens. One unexpected side effect of the move was that the transplanted trees promptly produced new growth points at the base of the trunk. Nigel Marshall, the then head gardener, suspected that severing the root tips prompted this reaction and verified his theory, by cutting around the root ball of a couple of plants that were not moved, which resulted in the similar sprouting of new growth points at the base of the trunk.[22]

More than one head to a trunk is virtually unknown in New Zealand, and shoots sprouting from part way up the trunk is not known.[23] However, there is one specimen at Mount Stewart which has not only a double head but also two well developed growth points sprouting from half way up the trunk. The cause of this doubly unusual specimen is not understood.

C. indivisa grows well in Co. Down, with quite a few mature specimens in both Castlewellan and Mount Stewart. Michael Leer commented that when he undertook the surveys of woody plants for the National Trust he was surprised that he did not see any mature plants in either Devon or Cornwall.[24] The species was relatively widely grown there almost a century ago, so it is surprising that mature specimens are not common in the south west of England. The climate in the coastal gardens there would be milder than Co. Down, but probably hotter and drier in summer, and with probably lower humidity. As early as 1906 Mr Arthington Worsley suggested "our midsummer heat may be too much", on the basis that "it is a plant of higher mountains in New Zealand (where very severe frosts occur)".[25] Dry conditions can certainly greatly reduce the length of the leaves and overall size of the head, which one specimen at Mount Stewart has displayed, which is growing in full sun has clearly suffered in the several long dry periods in the last couple of years. By 1923, the Rev. A.T. Boscawen VMH curiously noted that "it should be, where it has the protection of neighbouring trees, as it is not so hardy as the common *C. australis* and *C. banksii*".[26]

The hardiness of trees in cultivation will be largely influenced by the location of where the original seed was collected. The trees at Mt. Stewart are quite hardy, as, whist the double row of *C. australis* in the Italian Garden were killed back in the winter of 1981-2 with temperatures down to -16 ºC , the nearby specimens of *C. indivisa* were unaffected. My tree was raised by Nigel Marshall from seed set at Mount Stewart, and given to me as a young plant, and is a sibling of some of the other young trees at Mount Stewart. It survived a couple of nights of -13 ºC about 10 years ago without any problem and had also proved tolerant of the much more exposed conditions in my garden.

Raising *C. indivisa* from seed is not without its problems, as Thomas Ryan, the gardener at Castlewellan a century ago, described.[16] The first batch of seed, obtained by Lord Annesley from Mr Dorrien Smith of Tresco Abbey, failed to germinate. The seeds were planted in a greenhouse with a temperature of about 55 ºF. Subsequently the seeds obtained from Mr Burbidge were sown in a pan in a cold frame and took about 3 months to germinate. Within a few days of the first couple of dozen seedlings germinating, they "all lay flat on the ground through lack of moisture and in a rash moment we took the seed pan to a water tank

and let the soil soak from the bottom upwards." A couple of days later the seedlings were well recovered but the remaining seed had rotted. So it would seem that cool and moist conditions are necessary for germination but soil that is too wet will cause the seed to rot.

Otto Stapf, mentions that *C. indivisa* can easily be propagated from cuttings but to do so it is necessary to decapitate the plant.[5] This will produce many side shoots from the trunk which can be used for cuttings. I intend to try such cuttings this year, but do not intend to decapitate my tree, nor do I need to. For some unfathomable reason, last year it produced 20 shoots sprouting from the trunk, over much of its height (see photo page 21).

Acknowledgement
I would like to thank Jeff Irons for correcting the initial errors in the text and the additional information which he provided.

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WEST AUSTRALIAN CYCADS

David Ware

Cycads have long had a fascination for me as ancestors of these primitive plants were growing abundantly at the time of the dinosaurs around 250 million years ago. Cycads can be found in tropical and subtropical habitats from rainforest to semi-desert and vary greatly in shape and size. The endangered Mexican species *Dioon spinnulosum* which grows in the Palm House at Kew can for example reach 16m whilst those seen around Perth in West Australia reach 2 to 3m. There are three species of cycad endemic to south western Australia, *Macrozamia riedlei*, *M. fraseri* and *M. dyeri*.

M. riedlei is named after Anselm Riedlei, a French plant collector of the early 19th Century, and has the characteristic spiny leaflets growing to around 2m. The plant occurs from Perth to Albany and is a common understorey plant in the jarrah forests. The leaves arise at or just above the ground from a swollen underground stem with fleshy root tubers. They are rigid with a thick midrib and spreading sharp-pointed lateral leaf segments.

Separate male and female plants bear cones which become visible in the centre of the plant during late autumn (May). The male plants can develop up to seven



***Hakea nodosa* flowers**



***Hakea nodosa,* woody fruits**



***Hakea nodosa,* smooth fruits**



Fruits of *Hakea salicifolia*, or are they from *H. pachyphylla*?



***Grevillea rhyolitica* 'Deua Flame', Cranbourne Botanic Garden, Melbourne**

cones before the release of pollen. Shortly before maturity the tightly packed cone scales begin to open from the top downwards, releasing pollen either to the ground or on to the scale below. The total process is completed in around four days. The female plants produce cones either singly or in pairs. The cone scales bear two ovules (immature seeds) towards the cone axis. As the male cone releases pollen the female scales open 1-2mm for short periods. Pollen is distributed either by wind or by being transported by weevils. Weevils are attracted to the cones of the male plants because as the cone ripens it emit an enticing (to weevils) food odour. When the female cones are receptive the plant emits the same odour and it lures the pollen covered weevils to fly over to the female plant. Before the weevil can damage the seed ovule the female plant sends out a repellent odour which drives the weevil back to the male plant. Completing the cycle the weevils then lay their eggs.
By the following autumn the female cones have rotted and bright red seeds fall onto the surrounding ground. The seeds lie dormant on the ground for a year germinating after the winter rains. The germinating root pulls the young plant into the ground and juvenile growth is slow with a single leaflet being produced annually for several years.

This is an amazing life cycle story of a truly 'Jurassic' plant. One of the photos on page 22, taken at Kings Park, Perth, in October 2008, shows the female plant cones while the other shows its position amongst bush kangaroo paws (*Anigozanthus* species). Visiting Kings Park is always a pleasure and no more so than during September and October when spring flowering and growth is at its most dramatic. Free guided bush walks are offered every day and if you are lucky enough to visit Perth this is an opportunity not to be missed.

Editor's note
I was so intrigued by David's account of the life cycle of *M. riedlei* and, I realised after reading it, so ignorant of cycads as plants, that I spent some time looking them up on the internet. The cycads are a small group of plants of very ancient origin. Superficially they resemble palms and tree ferns but are related to neither. They are commonly classified as gymnosperms (along with conifers, *Gingko biloba* (Maidenhair Tree) and the *Welwitschia* group) but apart from bearing naked ovules (in contrast with flowering plants where the ovules are enclosed in an ovary) they have little in common with these plants either.

The original version of this article referred to 'zamia cycads', as does the Kings Park website. However, according to The Cycad Pages (plantnet.rbgsyd.nsw.gov.au/), Australian cycads belong to the genera *Macrozamia* (38 species), *Cycas* (26 species) and *Lepidozamia* (2 species) while cycads of the genus *Zamia* are found in the Americas. As all cycads are tropical or sub-tropical, in Britain cycads are strictly for the greenhouse.

CALLISTEMON NAMES

Jeff Irons

In the last two centuries of plant collecting the same plant was collected by different people, perhaps from different European countries, and given different names. Sometimes geographic or colour forms were given other names. This is most familiar to gardeners through rhododendrons, where supposedly different species turned out to be identical, but Australian plants were far from being exempt from this treatment.

When I began gardening there used to be a plant called *Callistemon macropunctatus*. Then it was discovered that earlier on it had been called *Callistemon rugulosus*. So that became its name until it became united with *Melaleuca* as *Melaleuca rugulosa*. The plant has had other names too. It has been called *Metrosideros macropunctata* and *M. rugulosa*. Other names were *Callistemon laevifolius* and *C. rugulosus* var. *laevifolius* and finally *C. coccineus*.

In nurseries the inevitable confusion has ensued and in continental Europe it has become *Callistemon laevis* and *C. levis*. Nowadays this name has been transferred to *C. citrinus*, which answers the question posed by Judy Clark in Pentachondra, December 2008 (page 28). In the Wirral imported plants labelled *C. laevis* are usually *C. citrinus*.

How can you tell the two plants apart? Actually it is very easy. Rugulosus means wrinkled and the leaves of *Callistemon rugulosus* (properly *Melaleuca rugulosa*) have a rough appearance. It is caused by oil glands. They are dark green and about 3-8cm by 0.5cm. Plants sold as *C. laevis* have smoother leaves but they are still rougher than those of citrinus whose leaves are dull green and about 5-8cm x 1cm. The flowers of *M. rugulosa* have prominent yellow anthers.

To make matters even more confusing, a violet flowered form of *M. rugulosa* is one of three different plants sold as *Callistemon* 'Violaceus'.

MORE ON HAKEAS

Jeremy Spon

A plant which I raised from APS seed labelled as *Hakea lissosperma* flowered the winter before last and has subsequently produced two seed-pods. My photo of the flowers (see page 31) shows clearly that the plant is not *H. lissosperma*, which has quite showy white flowers[1].

I am almost certain that it is actually *H. nodosa*, from the nature of the leaves and the flowering time. The clincher would be the colour and position of the seeds in the pod, but until they open, which they have not done yet (my photo of them (page

31, on the left) was taken last October, when the plant had already started flowering again) this cannot be assessed.

It is interesting to note that although the individual pods of *Hakeas* look impressive, each yields only two seeds. My third photo (see page 32) shows opened pods of *H. salicifolia*, (collected in South Africa, see my note in *Pentachondra* issue 37, page 25) and shows the imprint of one seed in the middle of the pod. The seed wing covered the remaining portion of the brick-red area. Apparently the position of the seed in the pod, and the shape of the surrounding area, are diagnostic features for certain species. (For more details see the Flora of Australia[2]; the section relating to *Hakea* is available online.)

Until my seed-pods open, I cannot be absolutely sure that my plant is not *H. pachyphylla*; it does make a difference as this latter plant grows above 800m in the Blue mountains, and might well be hardier. So far I have only grown my plant, whatever it is, in a pot in an unheated greenhouse, but if I can root some cuttings, or get viable seed, I will probably try it outside anyway.

Notes

1. Note to the seed manager: this is not a complaint - the mistake was probably made by the supplier, and the plant I have is well worth growing.
2. The Flora of Australia is at www.enevironment.gov.au/biodiversity/abrs/online-resources/flora/main

Editor's note

The photo on page 31 certainly looks like the plant which I know as *Hakea nodosa*. This species produces fruits of two sorts (the technical term for this is dimorphic) and both types may occur on the one plant, as has happened with mine. The warty, or more woody, type of fruit, like that which that Jeremy's plant has produced, remains closed while the smoother, or less woody, fruits are the ones which open (see photo on page 31 on the right).

IDENTITY THEFT

Jeff Irons

Before Christmas, in 2007 and 2008, all over the country garden centres both large and small were offering the 'Red Flowering Christmas Tree'. Labels called the plant Grevillea 'Red Salento' PBR. It was sold in a red plastic carrier at an asking price of £24 to £28. Its woolly leaves and hairy style identified the shrub as *Grevillea lanigera*, while the pink and white flowers confirmed it as the Upper Murray form. At first sight this is simply a case of someone registering a wild plant under a promotional name and selling it at a grossly inflated price. However it is much more than that and is a case of blatant identity theft as serious as New Zealand rebranding Chinese gooseberries as Kiwi fruits and America trying to rename Macadamia nuts as Hawaiian nuts. The label on each plant stated that

this Australian endemic is a “cold loving Mediterranean tub plant”.

The ‘red flowering Christmas tree’ epithet was obviously given because each plant had a coniferous shape. This was achieved by tying two or three of the low spreading stems to a stake, inserted in the pot. No attempt had been made to train the plant up the stake. Indeed given its habit, that would be difficult. In future years the plant will adopt its natural low spreading form.

If you want a winter flowering *Grevillea* with pink and white flowers, try the APS seed of *G. lanigera x rosmarinifolia* or for red flowers buy a specimen of *G. rhyolitica* (see photo on page 32). Neither will cost you anywhere near as much as much as the so-called ‘Red Flowering Christmas tree’.



AUSTRALIAN ANNUALS

Tony Entwistle

Australian annuals seem to be becoming more popular. For many years we had the ‘everlastings’ (*Acroclinum*, *Helichrysum*, *Helipterum* and *Rhodanthe* in old names), more recently *Scaevola* in blue, white or bicoloured, and now the latest addition to bedding plants is *Ptilotus*. It is offered as cultivar ‘Joey’ which looks from the picture to be somewhere between *P. mangleisii* and *P. obovatus*. Both *Scaevola* and *Ptilotus* are perennial if you can overwinter them, but I have never succeeded with Scaevola.



PITTOSPORUM BICOLOR

Jeff Irons

The account of the visit to the Hillier gardens which formed part of the 2008 AGM (see Pentachondra December 2008 page 34), mentioned *Pittosporum bicolor*. Members may like to know a bit more about this species, which is not described well in British books.

In 1988 I was given fruits of *P. bicolor* that had been collected in Tasmania's Mount Field National Park, to be given to the Australian National Botanic Garden as part of the country's bicentenary celebrations. They were so fresh that when I opened the pods the seeds were still a bright orange and embedded in a sticky substance. After germination I kept two seedlings and gave the others away. The species grows in cold wet forests, as a tree up to 14m tall. In high exposed situations such as sub alpine plateaus it becomes a stunted shrub. In my garden it was tree like. The yellow (not white as stated) and purple flowers were inconspicuous and since both specimens were the same sex I did not get fruits. The leaves and form were nothing special, so the species had no horticultural merit and I was quite pleased when both

died in the winter of 2000 when the garden was flooded. I would not recommend *P. bicolor* to anyone other than a collector with space to spare.

In spite of the fact that I loathe variegated plants there is one in my garden! It is *Pittosporum* 'Irene Paterson'. This plant has leaves variegated white and green. Because they lack chlorophyll, variegated plants are slow growers. In order to maximise their growth they are usually put in a sunny spot. However it occurred to me that the silvery appearance of this Pittosporum would enable it to lighten up a shady part of the garden. It has been put 100 ft away from the house, in a part of the garden that can be seen from the house windows yet never receives sun. That far away its hideous appearance is masked and it makes a useful blotch of lightness in an otherwise dark place. Unlike *P. bicolor* this one can be recommended.

MELICYTUS DENTATUS

Jeff Irons

The note on the Tree Violet in on page 35 of the December 2008 issue of Pentachondra is not quite right. The subject of names for *Hymenanthera dentata* is quite involved, but putting things as simply as possible, some of the plants that used to be *H. dentatus* are now *Melicytus dentatus*. Others are *Melicytus flexuosus* or *Melicytus* sp. Snowfields. APS seed of *M. dentatus* is from my garden, where I have male and female plants grown from Australian National Botanic Gardens seed. Pleasant View is the only nursery I know to have true plants. Its stock plants were raised from my cuttings.

M. dentatus makes a large, slightly thorny shrub. In early spring it is covered with tiny yellow scented flowers. In autumn female plants carry long lasting white berries. Overlarge plants can be pruned hard after flowering.

Sophora 'Sun King'

With reference to the article by Jeff Layman on Sophora Sun King (Pentachondra December 2008, page 24), I know the parent plant well. It grows by the bottom pond at the Sir Harold Hillier garden. It has been there for at least 20 years and whilst losing a few leaves in the coldest of winters seems very hardy. It is almost certainly a hybrid betwen a South American and New Zealand species. It produces viable seed, but the offspring do not come true to type. As for the name Hilsop (not Hislop as in the last but one paragraph), that's easy: HILliers + SOPhora.

Doug Smith

Swainsonia formosa'

The best display of Sturt's Desert Pea that I have ever seen was at the Liverpool International Garden Festival in 1980, when an area was planted up with pot-grown seedlings flown in from Oz. They were a mass of colour throughout the festival and two friends from Perth who were staying with me commented that it was better than at home! I have always found my own seedlings rotted off (see John Purses article in the December 2008 issue of Pentachondra), so I shall stick to *Clianthus puniceus* as a substitute.

Tony Entwistle

SEEDLING 'COT DEATHS': THE ANSWER, PERHAPS?

Bob Foulds

I wrote about seedling 'cot deaths' in the May 2008 issue of Pentachondra (page 6), without being able to offer much by way of a solution. Having few ideas about how to beat the problem of seedling decline after apparently normal germination I went back to the basics of plant growth.

Three factors could be involved: killing with kindness, poisoning with mineral salts, and depriving the roots of oxygen. So my compost recipe was 50% medium grade Perlite and 50% ericaceous compost which provides a low phosphate low nitrogen medium with lots of air spaces.

Seedlings pricked out with this romped away, growing well in an open north-facing cold frame during the summer months. Rain water was used when watering was required and steady growth continued. With the arrival of the first frosts in November the plants were transferred to a 'just-about-frost-free' greenhouse. As I write in late December growth continues well. I have never seen such good looking plants, with masses of roots.

Species grown were from APS seed of the following genera: *Xanthorroea*, *Chorizema*, *Hardenbergia*, *Anigozanthus*, *Kennedia* and others.



SEED SOWING AND RE-POTTING

Jeremy Spon

I wonder when members mostly re-pot their Australian plants. I asked Judy Clark this and she said 'when they look as though they need it', which seems logical enough! However, I guess the conventional answer would be 'in spring' as this is the usual recommendation for tender plants.

Gibberellins and germination

Have any members experience of using giberellins for germination? I reall that some years ago the Alpine Garden Society recommended their use for germinating Andean rosulate violas. I recently obtained some seeds of *Orites* from Chiltern Seeds with instructions to soak overnight in gibberellic acid, which I did, and was rewarded with three seedlings.

Tony Entwistle

recommendation for tender plants. The only problem with this is that many Mediterranean plants do not, I believe, actually make much new root growth during the summer, this being a period of significant to total drought.

So I have started experimenting with re-potting at least my West Australian plants in autumn, and I would be interested if any members have thoughts on this, or know of any research that has been done on the subject. I haven't killed any so far, and some have put on quite a spurt of growth through the winter - more in fact than during the summer, despite the lack of light and heat when they are put in their new larger pots.

On a similar theme, I would be interested to hear from anyone who has tried sowing seed in autumn. This definitely works well for plants from the Western Cape of South Africa, which has a similar climate to Western Australia (i.e. truly Mediterranean, with rainfall largely restricted to winter) so I am starting to try sowing a few West Australian plants in September and October. I am quite ready to be shot down in flames by our President, Jeff Irons, over this, but I think it is always worth trying new approaches especially with plants which have a reputation for being difficult!



SMOKE PAPER FOR GERMINATION

Tony Entwistle

In the December 2008 issue John Purse discussed the use of smoke for germination. Some of us have tried making smoke papers by spreading damp kitchen towel on a smoky bonfire and standing by to remove it when it turns a nice brown colour but before it catches fire – a tricky and time-consuming business . (Editor's note: perhaps a case of 'don't try this at home'!)

It is much easier to use the long established Kirstenbosch Instant Smoke Plus papers. These can be easily obtained by downloading an application form – just google 'Kirstenbosch Instant Smoke' – or by writing to Seed Room, Kirstenbosch Botanic Garden, Private Bag X7, Claremont 7735, Capetown, RSA. The cost including airmail is around £7 per

sachet of 5 papers (depending on the rand-pound exchange rate).

An English seed company, Jungle Seeds of Watlington, also sells smoke papers, at £9.50 per sachet plus hefty postage. And Plants of Distinction in Suffolk enclose a smoke paper with their protea seed. They describe the smoke paper as 'ours', and as a rare scientific discovery, but when I queried this they had to admit, rather reluctantly, that it was indeed Kirstenbosch smoke paper!

ASGAP 2009 Conference and Seminar Australian Plants in the 21st Century

ASGAP 2009, the 25th Biennial Conference and Seminar of the Australian Native Plants Society (Australia) (ANPSA) will take place in Geelong, Victoria between 26 September and 2 October 2009. The programme includes a huge variety of talks by knowledgeable and entertaining speakers as well as all-day tours of the Brisbane Ranges, the Royal Botanic Gardens at Cranbourne, and the Otway Ranges. There is also a choice of pre and post conference tours to Melbourne gardens and South Gippsland; the Grampians and the Little Desert; the Otways and the Shipwreck Coast; and the Goldfields to the Murray River.

This event will showcase the wide diversity of the flora of Victoria, its native gardens, and other local attractions. Victoria, located in the south east corner and one of Australia's smallest states, is known as 'the Garden State'. Its bushland vegetation types range from subtropical and temperate rainforests, sclerophyll forests, and dry and wet and grassy woodlands to mallee, low shrubland and sub alpine areas and approximately 4,000 plant species have been recorded.

for more information go to asgap2009.apsvic.org.au

Illustration acknowledgements

Judy Clark: pages 9 ,10 (*Wahlenbergia gloriosa*), 31 (*Hakea* fruit on right) & 32 (*Grevillea rhyolitica*), back cover
Gary Dunlop: pages 19 & 21
Sue Hyams: line illustration, page 16
Jeff Layman: page 10 (*Grevillea* ?b*arklayana*)
Jeremy Spon: page 31 (*Hakea nodosa* and *Hakea* fruit on left) & page 32 (*Hakea* fruit)
Graham Sumner: front cover
David Ware: page 22