

# Society For Growing Australian Plants fern Study Group

newsletter no. 9

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MEMBERSHIP: "ACTIVE OR PASSIVE?" This question was raised in newsletter No. 7 and members were asked to comment. We received many letters. A strong consensus was that a member once having nominated as "Passive" would feel restricted by the category and be reluctant to contribute if so moved. Another opinion suggested that the concept could create divisions, possibly with elitist or expert connotations, within a group of persons interested in a single subject viz. NATIVE FERNS. After discussion it was voted to abandon the concept of dual membership. The decision was that members should feel free to act in a passive or active manner according to how they are motivated at the given time. Thank-you for responding to the question.

BURRENDONG ARBORETUM: As a major project this year Sydney Group members decided to take a collection of native ferns to Burrendong to be planted in the new Sub-tropical area of the arboretum. This will be a weekend excursion on 18th and 19th October, 1980. Peter Althofer advised that this date would be suitable for our visit. As has been the practise on former excursions, we would be utilising on site caravans, camping sites and Motel accommodation. To arrange bookings from Sydney ring Sue Montgomery 6245753. Sydney members who would like to donate ferns but cannot make the trip could ring Molly Murray 6381084 or Gwen Hardwick 6383338 and we will arrange to transport your donation. We hope that country members close to the Wellington area will join us.

APTEROPTERIS APPLANATA was mentioned in Newsletter No. 8 as a new discovery. \*Reg Williams of Tasmania advises that it is not a NEW discovery but rather a separation from the New Zealand species A. MALINGII to which it was previously assigned. Reg sent us an abstract from material co-authored by himself and A.M. Gray, which in part tells us that APTEROPTERIS MALLINGII is usually epiphytic on the trunks of dead or dying LIBOCEDRUS BIDWILLI rarely on DACRYDIUM or NOTHOFAGUS SPP, and has been observed growing terrestrially. A. APPLANATA is usually found on the trunks of living or dead ATHROTAXIS SPP, and rarely on the bark of BANKSIA MARGINATA. Although preferring the trunks of certain trees A. APPLANATA like A. MALINGII will grow quite successfully as a terrestrial plant. A. APPLANATA has been collected from fissures in quartzitic or schistose rocks, at a considerable altitude, often well above the tree line. The two species are widely separated geographically. As far as known A. MALINGII is confined to New Zealand while A. APPLANATA occurs only in Tasmania. The specific epithet "APPLANATA" (Latin: Flattened, Expanded) is indicative of the most obvious difference between this species and A. MALINGII which has terete ultimate frond segments.

OUR THANKS TO THE AUTHORS A.M. GRAY AND R.G. WILLIAMS.

Also in his letter Reg commented on the interesting notes by Stephen Clemesha on GLEICHENIA and added some information on the distribution of G. ABSCIDA: - "The fern has been found in several localities in the south west including a very healthy patch with fronds up to 600mm high near the Serpentine Dam (part of the Middle Gordon Hydro Scheme) most of the sighted localities are more than a days walk from roads".

SPORE BANK REPORT: The Spore Bank has been busy in this last quarter with many requests from the various states. Those who requested *Cyathea woolliana* and have not received it, sorry; it will be sent on when available. I hope all other requests have been satisfactorily met and wish you success with your endeavours. The bank has good reserves, but as shelf life varies with individual species, (note Ray Bests' following article) I prefer to dispatch spore while it is as fresh as possible, therefore members wanting unlisted spore do feel free to ask, as it could become available during the year. I hope soon to add *Asplenium australasicum* and *Platycterium veitchii*. Should members request ferns not listed do not feel discouraged if not answered immediately,, as I may have to wait for that particular spore. Members who have not grown by spore before perhaps could be encouraged to try some of the easier ferns like *Pteris tremula*, *Christella dentata* etc. Lets know what spore you are most interested in! Tree ferns to date have topped the list. Can any member help with spore or fertile fronds of the rarer *Cyatheas*? I would especially like to thank all those members who have sent in spore - without this assistance we would not be able to function successfully. I would also like to thank members who have written to me about their ferns, they have been of great interest. Members who sent in fronds for identification, I hope we have helped.

AT PRESENT IN SPORE BANK:

<u>ATHYRIUM</u>	australe	<u>LASTREOPSIS</u>	marginans
<u>BLECHNUM</u>	gregsonii	<u>MACROTHELPTERIS</u>	torresiana
	cartilagineum	<u>MICROLEPIA</u>	spelunca
	nudum	<u>PELLAEA</u>	viridis (S.AFRICA)
	watsii	<u>POLYSTICHUM</u>	proliferum
	procerum (N.Z.)	<u>PLATYCERIUM</u>	superbum
<u>CHRISTELLA</u>	dentata	<u>PTERIS</u>	tremula
<u>CYATHEA</u>	brownii		
	cooperi	<u>TREE FERN SPECIES QLD</u>	(Species unknown)
	dealbata (N.Z.)		
<u>DICKSONIA</u>	antarctica	<u>CYATHEA</u>	australis
	youngiae		

SPORES AND THEIR VIABILITY by RAY BEST.

"Although having had considerable experience in growing ferns from spores; time has not been available to test out periods of viability or to keep detailed records of plantings of particular varieties. Generally those fern types that are difficult to grow from spores have been neglected for the more practical types. Also certain varieties are much slower in developing than others often taking periods from two to three years to develop first fronds. Propagation results are also affected by the collection of spores; spore bearing fronds should only be removed when the sporangia are ripe and full; before dehiscing commences. Taken too early the spores are immature, taken too late many spores have been cast and much waste material is present. An excess of this material in a setting can give rise to a fungus infection. Many fern species, cast their spores along with spore casings and annulus cells; it is wise in such cases to separate the material. One simple method is to place mixture on a cardboard sheet; slope and tap the back gently. The coarser and lighter material of annulus cells and sporangia casings moves away first, and the spores can be brushed back and collected separately. In some species the spores remain attached to the sporangia casing after dehiscing, here it is necessary to use an industrial sieve, such as a Greeburn Laboratory B.S.S. manufactured by Greer & Ashburner Pty. Ltd. Melbourne. Brushing the material gently through the sieve with a soft brush produces better results than any attempt to shake the sieve; due to the dust like spores. Such collected spores must never be placed in plastic containers, as when sealed condensation occurs creating moisture, that in turn gives rise to fungus which will carry over to the setting. Use paper only such as airmail paper or rice paper if sealing is desired, and sow as soon as possible.

Some knowledge of spores themselves assists in understanding their life cycle and propagation. Spores are formed within the sporangium in a number of specially constructed mother cells. These mother cells have a complete set of chromosomes (let us assume 82). When each of these mother cells mature they divide to produce double the number of cells; on this final division a reduction to half the number of chromosomes occurs. This is called meiosis or a reduction process; each of these new cells obviously has 41 chromosomes. These cells divide again until a full set of spores each with 41 chromosomes has formed within the sporangia. The number of spores to the sporangia differs with species with an average of possibly 60 spores.

The condition does not of course apply to all ferns. *Cyrtomium*, *Pteris*, *Cheilanthes*, *Pellaea*, *Asplenium*, and some others 10% of all fern types, reproduce by a process known as apogamy. In these cases the prothallus produces no functional egg cells in the archegonium, but does produce active sperm in the antheridium. This of course destroys the sexual cycle; so that new ferns are produced by direct budding of prothallus. Obviously both the spores and the prothallus of these species carry a full set of chromosomes. Research is still continuing into apogamous methods of reproduction, giving rise to much detailed and complex investigation. Another method is called apospory and is the result of a prothallus being produced directly from the pinna of a fern, instead of from spores as in some *Polystichum* varieties. An additional difference occurs in what is known as prothallium proliferation; this is proliferation of an old prothallus into eight new prothallia, and a long tapered cylindrical connection bearing yet another prothallus at its tip as in *Grammitis* and some *Polypodiums*. Obviously it is wise after removing a number of sporlings from a setting, to replace the covers as in many cases further propagation occurs often from slower developing prothallia or from apogamy, or prothallium proliferation.

Coming now to the viability of spores, the general practice is to sow them as soon as possible; as most research has shown that better results are obtained in this way. If sown within two or three weeks of collection this would be a fairly practical guide for a good setting of plants in most cases. However with green spores (those coloured green) such as *Todea barbara*, *Leptopteris*, *Grammitis*, and a few others, they must be sown within two or three days of collection. Some works state within two to four hours for a good strike. It is understood that the spores of most ferns will keep for many years, 40 years to 70 years in some cases. Refrigeration is reported to assist in retaining viability. The author assumes that with lengthy delay considerable viability would be lost due to possible fungus or insect attack as with most seeds. Very little data on the viability periods of particular spores is available, obviously such a procedure would be time consuming and might better suit the research departments of our botanical authorities. Possibly more detailed information may be available from such sources.

On the matter of sterilizing spores, most commercial growers find that the immersion of mature fronds in liquid solutions prior to sowing; or the treatment of separated spores seems to upset fertility; creating additional difficulty in handling as well. In nature itself the spores in most cases are carried on the undersides of fronds protected by indusia from undue dampening to be dehisced generally when dry conditions shrink the sporangia annulus cells. However where specimens of spores are held in herbaria for detailed examination; such treatment even though it may kill the spores, enable an extended period of examination without contamination."

Ray further comments: "In my own experience I have found that development times differ with seasons also; thus to make definite statements about viability is rather dicy. One practical instance may help, *Polypodium loriceum* (known as Queensland grub or caterpillar fern) originally from Tropical America, Mexico, West Indies and South America, being a slow grower and difficult to propagate is much sought after. Spores from my mature plant (about 10 years old) were set down in August, 1977, sizeable enough to plant out in April, 1979 and now in March, 1980 have two or three fronds about 3" long. This fern can be grown from a length of rhizome but this also is a slow process. When such ferns become freely available at a reasonable price I would assume these difficulties have been overcome."

BRENTON NICHOLSON OF TEA TREE GULLY S.A. reports of successful results from sowing spore on a mixture of 2/3 washed sharp sand and 1/3 peat moss which had been sterilised with boiling water. Brenton is interested in "Tree Ferns" and would like to know where he could obtain spore or plants of the rarer species. Amongst others he has nine DICKSONIA ANTARCTICA in his shade house, and five under a verandah in a southerly aspect. When buying this fern bare root he advises to plant the cut trunks fairly deep. This minimises stress as moisture doesn't have far to travel while the root system is poor and in a state of regeneration.

IRENE CULLEN OF QUEENSLAND WRITES: We recently discovered a colony of AMPELOPTERIS PROLIFERA growing on the banks of the Albert River - South East Queensland. The D.P.I., QLD. Herbarium confirmed the species. It is hardly likely that this would be a garden escapee growing where it is.

JOHN LEE OF N.S.W. comments on an EXTRAORDINARY Tree Fern, CYATHEA COOPERI. This tree fern grows profusely in private gardens and gully reserves in the Sydney suburb of Castlecrag. All are normal well-behaved specimens, each with a single trunk and crown, except for one specimen in the garden of a local resident, Mrs. Cook. This unusual specimen has a single trunk to a height of 1.5 metres, then branches into four (4) trunks. Half a metre higher it again branches so that the tree fern has six (6) distinct crowns instead of the normal one. Mrs. Cook was unable to account for the strange characteristics of this specimen though she did describe her young casual gardener as a "butcher" and a "slasher". Could the branching of this specimen of C. COOPERI be a result of slashing by the young man in a fit of youthful exuberance or is there some other reason? It would be interesting to hear from members whether the branching of C. COOPERI is rare and their views on the cause.

MICROSCOPE: We wish to thank members who so generously sent donations. Sydney members also raised \$60 from the proceeds of raffles. The purchase of a MEIJI/LABEX Microscope -mag. x 20 + 2 extra lamps, for the price of \$262, was arranged and financed by our Honourary Treasurer, Fay Low, who is reimbursed by the Group as funds accrue. During this short period the microscope has proved invaluable in separating spore from waste material.

Group Membership fees of \$2.00 apply for a calendar year. If our records show that we have not yet received your 1980 sub., a Cross will be placed here..... as a reminder. If your sub. is not received before 31st August. we will assume that you are no longer interested in belonging to this Group and do not wish to receive further newsletters.

ACTIVITIES:

JULY: SUNDAY 27th meet at Memorial Gardens Lawson at 10.00 am. Enjoy some mountain air, scenery and a bush walk.

AUGUST: SUNDAY 24th 10.00 am. we are joining other Groups for a day at WEST HEAD ON THE BRISBANE WATERS ( approx. 2 hrs. drive from Sydney). Conducted walks with S.G.A.P. members. Make your own way or contact nearest Regional Group for a seat on chartered bus.

SEPTEMBER: SATURDAY 6th, SUNDAY 7th, WILDFLOWER EXHIBITION PEAKHURST HIGH SCHOOL. The Group has been asked to mount a Fern Display. Help will be needed on Friday 5th. with setting up and / or loan of potted or hanging Native Ferns tagged with owners name. Come Along.

OCTOBER: SATURDAY 18th, SUNDAY 19th. BURRENDONG DAM (See Page (1) )

NOVEMBER: SUNDAY 23rd. meet 10.00 am. W.R.A.A.C. BARRACKS MIDDLE HEAD tour of Historic Barracks, Garden and nearby foreshore. An informal meeting during picnic lunch to arrange venues for 1981.

Something further needs to be said about the item on page (4) which mentions membership fees. You may well be wondering what you are receiving for your two (2) dollars. Indeed, unless you live in the Sydney area and have been able to take part in our excursions and meetings there has been a lack of involvement for you which is regretted. Our Group began in a tentative fashion with a one (1) dollar sub. then a membership and cost explosion occurred. Little things such as paper, postage etc. ran us into problems. We are all S.G.A.P. members and our executive body in its wisdom decided to regulate group membership with a two (2) dollar fee. For this sum we intend to forward you quarterly letters with information relating to our native ferns.

Extracting information from the people who know "all those details about ferns, that you and I would like to know", can be difficult. They are very busy people, so that leaves you and I. If you enjoyed the contributions in this letter from our fellow members, as I did, how about telling me something about the ferns you grow or those that grow nearby.

Much research is taking place in academic circles as to which genera a fern species may truly belong etc. my information is that a paper co-authored by several botanists could be released next year. The work is not yet finished.

"Australian Ferns and Fern Allies" by D.L. Jones and S. Clemesha has been revised and updated. Stephen expects it to be available late this year and will advise us of any progress made towards a date for publication.

Items relating to spore cultivation appear to dominate this letter. People are becoming interested, sowing spore and meeting with success or learning from failure, one such person is Lynn Haddow of Beechworth Victoria, who explained that by a lot of reading, some trial and error and completely lacking anyone with whom to share her interest she managed to germinate spore. In the space of months she now has twelve or so varieties growing, several of which are showing their first fronds. Lynn says "my purpose in writing is to encourage those who lack confidence; to give it a try, because the success I have had came as a complete surprise!"

One doesn't need an elaborate set-up to try a batch of spore, this was demonstrated by Sam Jack who lives in the Blue Mountains west of Sydney. At a recent meeting held at his home he showed members how to make a min-terrarium by inverting the domed bottom of a two (2) litre plastic soft drink bottle over a margarine container into which he had placed his soil-mix and spore.

Other methods of propagating ferns are fairly well known, but for the benefit of newcomers a few of these are: vegetative division where plants with long or short creeping rhizomes are severed with a sharp knife at a point between the original plant and the new growth. I prefer to leave the new plant in the ground for a few months after cutting to develop a strong root system before lifting.

Bulbils or proliferous buds which grow on the fronds of plants such as Aspleniums or Polystichum. I have success with these by planting them in sand which I keep wet in a sheltered position.

We hope the revised membership list may enable you to contact members in your area and share your interest in ferns. In the weeks since it was printed there have been some alterations and additions. We were pleased to enrol the Fern Society of Victoria as a Group and have written to their secretary asking for a reciprocal arrangement, hoping to broaden our knowledge of Australian native ferns endemic to that state.

In answer to those who have enquired as to where they can buy Native ferns.....When my neighbour Gwen Hardwick and I seriously began collecting, our golden rule was never to pass a plant nursery, often we "picked up" an interesting fern which had been sitting neglected under a bench; our husbands still cringe visibly in the drivers seat when signs appear saying "Ferns" or "Nursery". This is how we gained our first Blechnums, Doodias and the more common natives. Since then we have become more selective. In the Sydney area the Glenhaven Greenhouse on Glenhaven Road, Glenhaven, currently has *Adiantum hispidulum*, *A. diaphanum*, *A. aethiopicum*, *Aspleniums* and *Polystichum* to name a few. Driving west from Sydney to the mountains, the nursery opposite the lookout at the top of Bellbird Hill Kurrajong, is where we bought *Blechnum patersonii* and *Asplenium flabellifolium*. North of Sydney the Wayfarer Nursery at Peats Ridge on the road to Gosford often has ferns from northern Queensland. Yallaroo Gardens Wattle Tree Road, Holgate via Gosford has a good range of native ferns. My knowledge of Queensland, Victoria, and South Australian nurseries is restricted to brief visits. On Mount Tamborine Queensland there are several nurseries, I visited only the Fountain Ferneries where I purchased *Goniophlebium subauriculatum* cv. *knightiae* for a reasonable price. In Victoria travelling from Dandenong to Warburton via Monbulk we bought *Blechnum penna-marina*, *B. fluviatile* and *B. chambersii*. In South Australia the Blue Lake Nursery at Moorak via Mt. Gambier had a fair selection of native ferns. We again invite members to tell us of their favourite haunts for buying ferns.

\* Reg Williams is a rock climber and bush walker of some repute in Tasmania and beyond. He worked for many years as a hydrographer with the Hydro Electric Commission. His years of study and observation in the field have compensated for lack of formal botanical training. He is highly regarded as an interested and knowledgeable amateur.

ALTERATIONS AND ADDITIONS TO MEMBERSHIP LIST DATED 1.5.80.

VICTORIA:

Add: Mr. J. Knight, 23 Hodson Rd., Warrandyte. 3113.  
 " The Fern Society of Victoria, C/- Mr.C. Goudey, Lot 8,  
 Cozens Rd., Lara. 3212.

Delete: Mrs. F. Fletcher, 247 Waverley Rd., East Malvern. 3145  
 and replace by: Mr. D.B. Fletcher, 247 Waverley Rd., East  
 Malvern. 3145.

NEW SOUTH WALES:

Add: C.J. Bosse, 16 Garden Ave., Lismore. 2480.

QUEENSLAND:

Delete: Mrs. R.R. Cullen, 45 Jones Rd., Carina. 4152.  
 and replace by: Mrs. I.M. Cullen, 122 Larch Rd., Tamborine.  
 4270.

*Molly Murray* LEADER.  
 FERN STUDY GROUP.