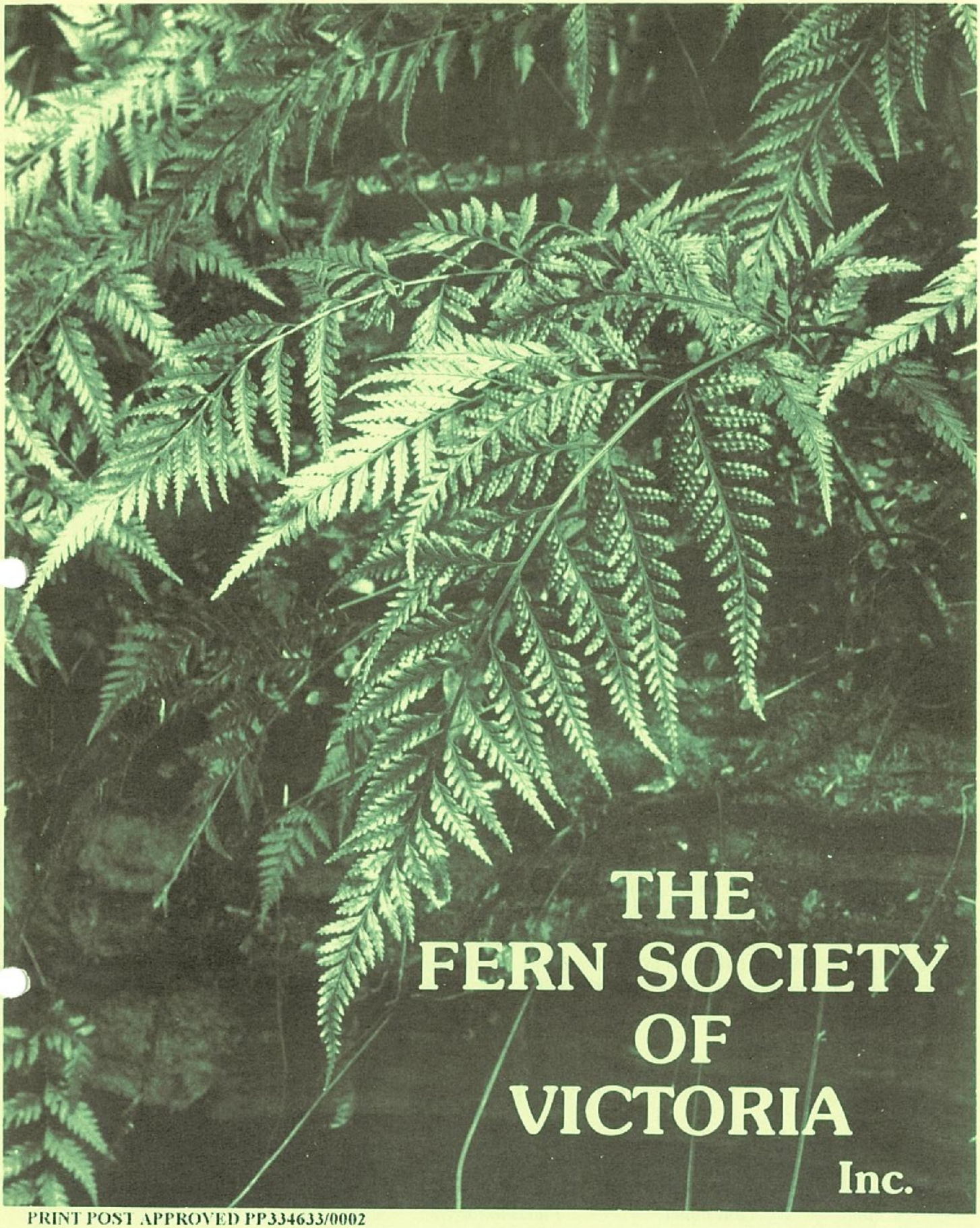

# THE FERN SOCIETY OF VICTORIA Inc.

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# NEWSLETTER

VOLUME 17, Number 2 March / April, 1995

# FERN SOCIETY OF VICTORIA Inc.

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**COMMITTEE MEMBERS:** Bill Gouge, Simon Hardin, John Hodges, Norma Hodges Margaret Radley, George Start, Bernadette Thomson.

**SUBSCRIPTIONS:**

| | | |
|---|---|---|
| Single - | $15.00 | (Pensioner/Student - $11.00) |
| Family - | $18.00 | (Pensioners - $13.00) |
| Overseas - | A$30.00 | (by Airmail) |

**Subscriptions fall due on 1st July each year.**

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## FROM THE EDITOR

There is no President's Message this month as Barry White is still overseas at the time of writing.

This gives me a prominent space in which to emphasise the fact that this Newsletter is a combined March / April edition. I will be in Indonesia during March and Terry Turney, who acted as Editor during my absence last year, will be overseas on business. Information regarding both the March and April general meetings is included plus the usual advance information on the Fern Competition for the May meeting. Four extra pages are included to partly compensate for the missing issue. I apologise for the poor quality of the printing in some parts. My printer is not the correct type for the job and seems to have performed worse than last time.

## FEBRUARY MEETING

The category for the Fern Competition for this month was any fern native to Victoria. Congratulations to the following winners:

| | | |
|---|---|---|
| First: | Don Fuller | *Pteris umbrosa* |
| Second: | Dorothy Forte | *Adiantum aethiopicum* var. *frostii* |
| Third: | Dorothy Forte | *Blechnum fluviatile* |

The draw for the exhibitors' prize was won by Dick Kissane.

Winners of the Special Effort draw were Bernadette Thomson, Norma Hodges, George Start, Anne Bryant and Jean Boucher.

# FORTHCOMING MEETINGS

(1) THURSDAY - 16th MARCH, 1995

Topic: GROWING CONDITIONS - PANEL DISCUSSION

Leader: DON FULLER

(2) THURSDAY - 20th APRIL, 1995

Topic: THE DECIMATION OF DAVALLIAS - A New Look at Haresfoot Ferns

Speaker: TERRY TURNEY

VENUE: The National Herbarium, Royal Botanic Gardens
Birdwood Avenue, South Yarra
(Melway Ref. 2L A1)

MEETING TIMETABLE:

| | |
|---|---|
| 7.30 p.m. | Pre-meeting Activities:- Sales of Ferns, Spore, Books and Special Effort Tickets. Library Loans. |
| 8.00 p.m. | General Meeting |
| 8.20 p.m. | Topic of the Evening |
| 9.30 p.m. | Fern Competition Judging |
| | Fern Identification and Pathology |
| | Special Effort Draw |
| 9.45 p.m. | Supper |
| 10.00 p.m. | Close |

FERN COMPETITIONS

The categories will be:

(1) March - **A Favourite Fern**
Please Note: This is a change of category. The February Newsletter stated that the category for March would be a *Davallia*, but Terry Turney's talk on this group had to be deferred.
(2) April - ***Davallia***
(3) May - ***Adiantum***

## WANTED TO BUY

One of our members wishes to obtain a copy of "Encyclopaedia of Ferns" by David L. Jones, which is now out of print. If anyone has a copy which they are prepared to sell, would they please phone Bob Lee on (03) 836 1528 with details.

# 1995 FERN SHOW

## Saturday, 1st April - Sunday, 2nd April

Our Fern Show at the Herbarium on 1st and 2nd April is fast approaching and arrangements are well in hand. What is now needed is the support of all our members. This can be provided as follows:

**Publicity:**

Please mention the Show to your friends and arrange to display our advertising flyers in suitable places. Extra copies will be available at the March meeting.

**Ferns for Display and the Sales Bench:**

Please bring in your favourite ferns for the displays. We are most anxious to receive any uncommon ferns for our feature display of Indigenous Australian Ferns (and their cultivars).

Those wishing to sell ferns are reminded that it is necessary to obtain a "booking-in" form from Bernadette Thomson (399 1587) and complete it beforehand.

**Please note that the competition category listed as "3. Australian Fern" in the February Newsletter should read "Indigenous Australian Ferns plus their Cultivars" (including Lord Howe and Norfolk Islands.**

**Attendance at Show:**

It is hoped that all members can attend the Show at some time. A special invitation is extended to those members unable to attend our monthly meetings. Come and make yourself known .

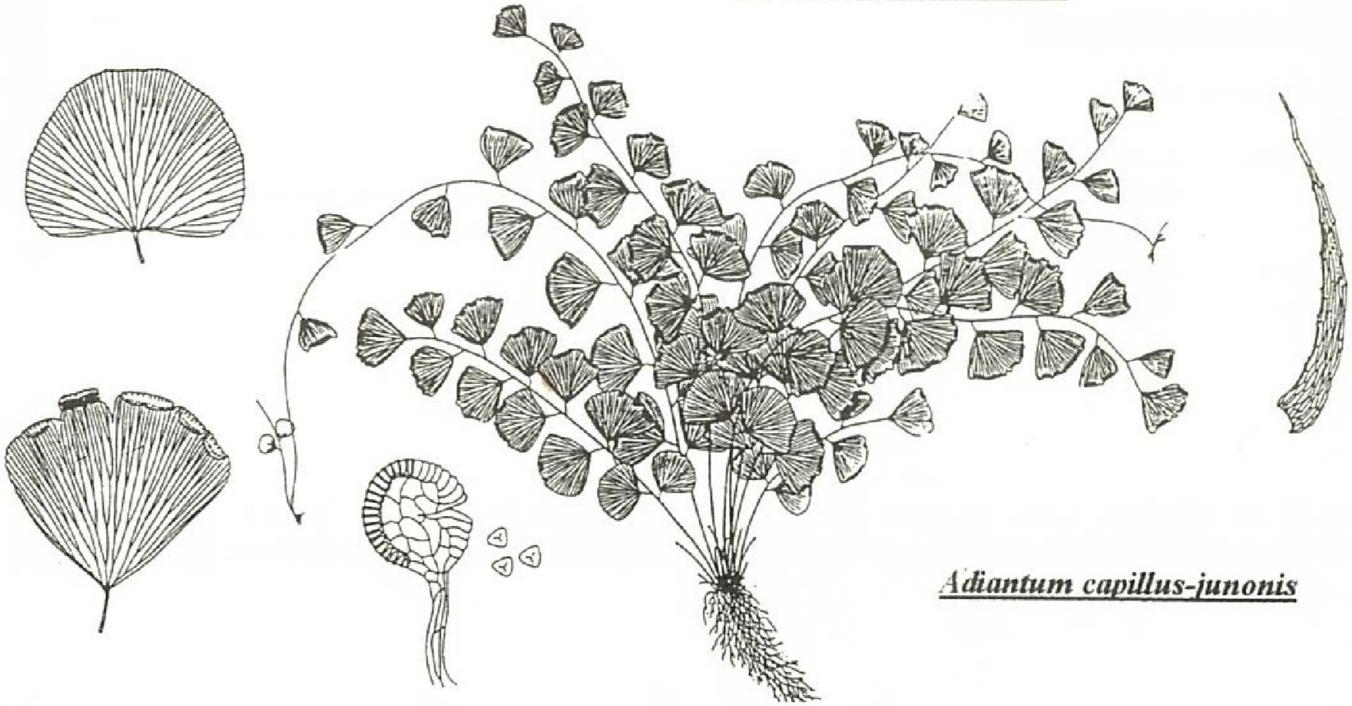
**Assistance:**

We are still most anxious to hear from anyone who can assist with the setting up on Friday, staffing the Show on Saturday and Sunday and cleaning up afterwards.

Setting up the fixtures in the display and sales areas will commence at 12.00 noon on Friday, March 31st and we should be in a position to accept display and sales ferns from approximately 2.00 pm. Anyone wishing to bring in ferns for either area on Friday evening or early Saturday morning should discuss and make arrangements with either Bernadette Thomson (399 1587) or Don Fuller (306 5570).

The Fern Sales Area will need a large number of cardboard boxes suitable for packing ferns. If you can help by providing some it would be greatly appreciated.

**Don Fuller**
for Fern Show Committee



***Adiantum capillus-junonis***

SPEAKER REPORT - GENERAL MEETING, 16th FEBRUARY, 1995

# TREE-FERNS - HARVESTING, EXPORT AND REPLANTING

## Speaker: Neil Pike

*(The following report was kindly written by Lyn Gresham)*

Neil is a co-proprietor of the family nursery, Fernworld, situated at 572 Heatherton Rd., Springvale. He gave an account of his experiences in trying to develop marketing operations in Australia and overseas for *Dicksonia antarctica* tree ferns.

Some years ago when working in what was then his parents nursery, Neil was invited to clear large numbers of *Dicksonia antarctica* from a property in Noogee. He found such a demand for these tree ferns that seven months later he was employing seven workers and he began to see the possibility of expansion.

Another happy coincidence followed - an acquaintance who worked for Associated Pulp and Paper Mills (APPM) in Tasmania showed him a 208,000 hectare forest block where the *Dicksonia antarctica* were being bulldozed to make way for loggers. He was given a licence to clear this area of the "weeds" and for two years he did just that, exporting them to the mainland at the rate of two or three containers a week. Inevitably, a royalty was introduced and other people realised the potential for profit. Soon, human nature being what it is, there were three licensed and seven unlicensed operators. These last seven cut their prices to increase their share of the market, making legal operations unprofitable. No help to stop the illegal operations was forthcoming from either political party and attempting to exert pressure through the conservation movement produced an adverse effect.

In 1985, he began investigating the viability of exporting internationally and discovered that there were no *Dicksonia antarctica* growing overseas. He easily obtained an export licence and in 1987 the first container load went to America. Here he paid $37,000 for fumigation in quarantine, only to have the whole shipment perish after ten times the recommended quantity of fumigation chemical was used. Neil suspected sabotage to protect the existing American domestic market! Legal action against the quarantine service to recover his costs would probably have been successful but would inevitably have resulted in cancellation of his American visa, so he cut his losses and looked elsewhere.

For over two years Neil tried in vain to get another export licence, his American failure being quoted as the reason for refusal. During this period he spent five months personally promoting Dicksonias at the Osaka Expo in Japan, using ten 3-metre tall tree ferns as part of the landscaping there. Twenty million plantsmen from around the world passed by and many were interested in importing our tree ferns to their countries. Expressions of interest to our Government finally resulted in an export licence being issued. Neil promptly sent off a container each to Spain, France, Holland and England without having any firm markets for them. Happily, the response to his shipments was so positive in France, Holland and England that in 1993 he set up nurseries in these countries. The Spanish venture was not successful. In December, 1994 a moratorium was placed on all tree fern exports by the Tasmanian government, so his export activities have again been halted (he still harvests for sale on the domestic market). The English and French nurseries have survived until now on stock held in pots, but this is now exhausted and they face closure. The Dutch operation had diversified to 50% conifers and is able to continue operating.

In Victoria permits can be obtained for harvesting on private land but not on Crown land. Neil does not operate in Victoria.

TREE FERN ASSOCIATION OF AUSTRALIA.

A prerequisite for the renewal of Neil's export licence was the formulation of regulations controlling the harvesting of tree ferns, which would assure the survival of the species. To this end, the Tree Fern Association of Australia (TFAA) was formed by the tree harvesters in Tasmania, some landowners and the University of Tasmania. The Association developed a

management plan which included replanting half of the ferns harvested into reserves and exporting only the other half. They also decided to investigate the feasibility of planting propagated tree ferns as an understorey crop in eucalypt and pine plantations. The Australian Conservation Foundation supported the scheme with letters to the Government and the nursery industry generally is supportive of the TFAA. However, the moratorium is still in place.

Neil then went on to discuss cultural and transportation methods. This part of his presentation was in the form of responses to questions and comments from the floor.

TRANSPORTING IN CONTAINERS.

When the container of the first overseas consignment (to America) was opened it was found that the trunks had developed fronds even though they were in total darkness. As the trunks were horizontal and the fronds developed upwards they would have had to be removed for cosmetic reasons (if they had not died in fumigation!). This would have caused a delay before they were saleable, a potentially costly complication.

They experimented with cooling the containers and found that this successfully inhibited the development of fronds in transit. The optimum temperature varies according to the area of origin of the plants. Ones harvested on the west coast of Tasmania, where weather conditions and temperature are extreme and variable, are very tough. They were found to tolerate two months at -5$^{o}$C in a dormant state, resuming growth within two weeks at higher than +5$^{o}$C. Losses were down to nil.

A 20ft container holds on average about 500 tree-fern trunks, ranging between 1ft (30 cm) and 6 ft (180 cm).

TRANSPLANTING AND TRANSPORTING OTHER MATURE TREE FERNS.

*Dicksonia antarctica* is unique in its ability to reliably sprout roots on a severed trunk and this makes it particularly suitable for an export trade. In New Zealand, fences of *D. squarrosa* can be seen with shoots on them but they only stay alive for about a year, presumably drawing on their existing reserves of energy. Three years ago New Zealand exported *Dicksonia fibrosa, D. squarrosa*, some *Cyathea dealbata* and others. The majority were *D. fibrosa,* which were unfortunately marketed as *D. antarctica.* Most died within a year, making it more difficult to market Australian *Dicksonia antarctica* in their wake.

Most mature tree ferns die on transplanting, but if they are removed with a fair root system and replanted quickly enough a small percentage will survive. However, they do not withstand the process of exporting - packing in containers and time in quarantine - at all well. Fifty plants of *Dicksonia squarrosa* potted up in soil were once sent to England but only a few of them have survived.

*Dicksonia sellowiana* was being illegally harvested and exported to Holland from its native South America until the Dutch buyers had beaten the price down from $40 per foot to $5 per foot. Mulching them for garden mulch for the U.S. market paid better than that, so this was done, with no limits or controls, to such an extent that *D. sellowiana* almost became extinct. Their operations had not carried any limits or controls. These ferns had been more plentiful than our *D. antarctica* - a warning that we should heed.

RESEARCH - UNDERSTOREY PLANTING.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) requires applicants for an export licence to prove from studies of population dynamics that their harvesting would not jeopardise the survival of the species. The Australian National Parks and Wildlife Service acts as management authority for CITES.

Neil commissioned a study by two scientists from the University of Tasmania, who specialised in agroforestry and they concluded that the current rate of harvesting was not sustainable. They then conducted research projects, one of which proved that propagated tree ferns could be successfully grown under the trees in pine and eucalypt plantations in Tasmania's cool, moist climate. They do not compete with the trees for water and nutrients. The propagated tree ferns are planted out at the tube stage, one metre apart in plots of ten metres square. As they can't be watered after planting they are well mulched. This works well because they are being placed in areas where the soil is spongy and moist all year round. There were many examples documented from hearsay and personal experience of those present at the meeting of Dicksonias and some other ferns naturalising under pine trees in various locations, the common factor appearing to be a constant, plentiful supply of water.

Experiments are being conducted now on understorey planting of a few of the Cyatheas and *Todea barbara* (endangered in Tasmania).

While the University researchers are going through the forests researching tree ferns they are discovering species of other plants which are either unknown or endangered, and doing tissue cultures with them.

TAGGING.

CITES also required that all harvested tree ferns be tagged to allow their origins to be traced. Consequently a tree-fern tagging system was set up by the TFAA, the tags being attached securely while the ferns are still standing. These are then sold with tags intact as proof that they have been harvested legally. However, licensing and policing of the system is inadequate.

FARMING AS AN OPTION.

Licences are available for exporting propagated tree ferns but not ones from the wild. However, site preparation is expensive and the plants must be purchased in lots of 20-30,000 to make a project viable. At present funds are exhausted. Financial grants are being sought through the University of Tasmania and the Australian Conservation Foundation is trying to organise help with unemployed labour.

INTERNATIONAL FEEDBACK

As Neil didn't really know where in the world his tree ferns would grow and wanted to establish an ongoing business, in the first year of exporting he distributed tree ferns to the botanic gardens and main horticultural colleges throughout Japan, Korea, Great Britain, France, Holland, Spain and Italy, in return for a report a year later on how they had fared. These reports proved that they would grow in all these places (even in Holland at -20°C with a plastic bag over the crown).

GROWTH RATE

Neil's statement that *Dicksonia antarctica* has a growth rate of 30cm in ten years was challenged by some members (who felt it was higher) but he explained that the only properly documented growth rate was from Glasgow Botanical Gardens. In the absence of any other authenticated studies, that is the scientifically accepted one. The *Dicksonia antarctica* grown in Queensland, a slightly narrower plant, is faster growing than the Tasmanian one. It seems that, within their environmental tolerance level, those which are moved north of their native area grow more vigorously. So a fern from Tasmania will grow faster in Victoria, a Victorian one faster in N.S.W. and so on.

SUGGESTED CYATHEAS.

There were suggestions from the floor regarding the suitability of some Cyatheas for various countries:

- *Cyathea cooperi* does not last long in Northern Europe because of the severe winter. However, it naturalises so well in Hawaii it has been declared a noxious weed there.
- *C. kermadecensis* is very fast growing - possibly the fastest. It would not be suitable for the U.K.
- *C. smithii* would probably be suitable for Japan as it even grows on a sub-Antarctic island. It is the coldest growing tree fern in the world.

INCIDENTALS.

Neil posed a question: A section of *Dicksonia* which is minus its crown cannot throw out fronds. However, it will root vigorously if laid on damp ground. Does anyone have any ideas on why?

Neil has been invited to contribute to a book being compiled by David Given, head of the Pteridological Society in Christchurch, N.Z. with A. Clive Jermy, Vice-President of the British Pteridological Society and Curator of Ferns, Royal Botanical Gardens, London, on the conservation of ferns world-wide. David Given is considering the application of the TFAA's concept of harvesting/replanting/preserving to other flora.

Some members particularly encouraged Neil in his crusade, and the meeting expressed its thanks in the usual manner for an interesting and informative evening, rather away from our usual type of presentation.

# *NIPHIDIUM CRASSIFOLIUM*

**Ray Best**

A local nurserywoman provided me some time ago with a plant of *Polypodium crassifolium* Linnaeus. Reading about a plant now called *Niphidium crassifolium* (L) Lellinger 1972 (Lellinger being an American botanist), I concluded that these were the same species. The classification still remains in the Polypodiaceae group. The foliage is indeed crass, which I presume accounts for its species name. As my plant is now mature I decided to make a black and white original (*see copy below*) and watercolour.

Additional work on this complex, especially field studies to assess local variation and cytology, are needed to determine the status of the *Niphidium crassifolium* segregates (Tryon and Tryon, "Ferns and Allied Plants.....", page 730). *Niphidium* is usually rupestral or epiphytic, sometimes terrestrial. It grows in a variety of habitats and has an extensive altitudinal range. Species may grow in dense wet rainforests, in cloud forests, through a range of habitats to dry, rocky slopes, open scrubby places or on soil. It grows on the ground on dead stumps, decaying logs, fallen branches, etc. Most common below 2,000 metres.

The following description comes from "Ferns of Jamaica" by G.R. Proctor (page 52):
Rhizome woody, short creeping, 5-15mm thick, enveloped in a dense mass of rootlets, clothed at the apex with imbricate, bicolorous, finely clathrate, lance to ovate acuminate scales 8-12mm long. These with blackish central band and pale sub-entire margins. Fronds few, close, stiffly erect up to 1.5 metres tall, stipes stout, 5-15cm long (rarely more). Broadly grooved on the upper side. Blades narrowly green and marginate, oblanceolate from 4-14cm broad at the broadest point, rounded or sharp at the apex, attenuate at the base. Primary veins oblique and prominent 4-10mm apart and parallel; the secondary veins forming areoles, each areole enclosing a simple or branched free veinlet with stiff and leathery texture. Sori circular to oval, large and prominent, 1.5-3.5mm in diameter, each arising from an irregular ring of united veinlets without indusium and medial between the primary veins, mostly confined to the back of the upper halves of the blades and forming a distinct regular pattern. From Tropical America, Mexico, Peru, Bolivia, Jamaica and Brazil.

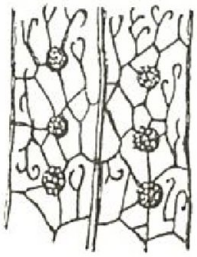
**Glossary:-**

- **acuminate** - tapering to a long drawn-out point
- **areole** - a space between the veins in a network
- **attenuate** - tapering and drawn out
- **bicolorous** - having two colours
- **clathrate** - with cell walls thickened in the form of a lattice
- **imbricate** - overlapping like fish scales
- **marginate** - with a margin of distinct character
- **oblanceolate** - lanceolate with the broadest part above the middle
- **ovate** - a flat plane with the outline of an egg

SPORE
X 1000

NIPHIDIUM
CRASSIFOLIUM (L) LELL.

SECONDARY
VEIN DETAILS



HABIT IN
A TERRESTIAL
SITUATION

*With our 1995 Fern Show due to start on 1st April this seems an appropriate time to publish the following two articles which are taken, with thanks, from the newsletter of the San Diego Fern Society, "The Fern World", XVIII, 8, August, 1994 and XVIII, 10, October, 1994.*

# SO, YOU BOUGHT A NEW PLANT AT THE SHOW

I was looking around for an article for this month's "Fern World" and I was reminded that occasionally repeating basic horticultural information can be a good thing. So, from the August, 1988 issue of "The Fern World" I am re-running a slightly edited version of what to do with your new fern after the sale.

Since many of you will go home with new plants after the sale, here are some basic thoughts on what to with your plants now and some basic reminders about the continuing treatment of ferns to keep them (and you) happy.

1. Make sure you buy a healthy plant. Look to see if there is healthy new growth on the plant. Check it carefully for insects and disease before you bring it home.

2. Do some research about your plant. Read your literature (or get a book from the Fern Society library) to find out what kind of environment your new plant likes.

   See if you can determine what is the plant's natural habitat.
   - how much sun does it like?
   - what kind of light does it like best (direct, filtered, deep shade.)?
   - what kind of soil does it grow in?
   - does it like to be dry, moist, or wet?
   - what are its humidity requirements.?

   This information will tell many important things. You'll know more about how to water the plant, how much water it needs and whether you should water it from the top or the bottom. You'll know whether you have to grow it in a terrarium, in a protected area, or right out with the other plants.

   You'll also find out how the plant gets its nourishment and what kind of soil it naturally grows in. Some plants love lime, some love acid and some require a neutral mix. All the care in the world is not going to grow a lime-hating plant (calcifluge) like *Blechnum spicant* in a lime-based mix. David Jones' "Encyclopedia of Ferns" has some wonderful appendices which identify the special requirements for many ferns.

   In addition, you may also want to research how the plants grow. It's important to know how your plant reproduces, how the rhizomes grow (creeping, upright, spreading, etc.) and how deep the roots grow. Some plants grow shallow roots and can be planted in a shallow pot. Some plants grow deep roots and need a deeper pot. How fast and deep the roots grow will also help you decide how often you need to transplant your plants.

   Finally, knowing whether the plant is usually terrestrial (grows in the ground), epiphytic (grows on other trees and shrubs), or epipetric (grows on and in rocks) will help you make final decisions about the proper container (pot, basket, terrarium, on a rock, or in the ground).

   As a side note, several people have grown hardy ferns in San Diego and have find that they have the most luck putting these plants in the ground, rather than in pots.

   Label your plant with its correct name. You can also add information about when and where you got the plant to help you remember more about the plant's age and origin when it's time to replant or if you want to buy another one.

3. Put your plant where it gets the right kind of light and some air movement. Most plants need a little air (a little draft, not a gale) to do well. Also, moving air will help keep the plant from suffering from frost when the temperature dips toward freezing.

4. When you're ready to transplant, there are some general guidelines :

   (a) Choose a container about 1" bigger than the root ball on all sides. You don't want to put the plant in too large a container or it may not do well. The theory is that the larger amount of soil holds

too much moisture in relation to the active roots and the roots can't get properly aerated.

(b) Use a new container or clean the old container thoroughly. If the previous plant in the container died from a fungus or a virus, you don't want to put in a new plant without getting rid of the disease first. You also want to get rid of any salt buildup on the pot.

Soaking the pot in a dilute solution of Physan or a similar fungicide and a little bleach will make it easier to remove the salt and will help kill any existing fungus. Rinse the pot afterward in plain water to remove the bleach.

(c) For most plants use a light, clean potting mix that drains quickly. Most regular mixes are made up of peat, perlite (or vermiculite), and some amendment like nitrogenated redwood compost. Depending on the plant, you may want to add lime (dolomite, oyster shells, cement chips, etc.), sand, charcoal or sulfur (ground sulfur, ammonium sulfate, etc.). Some growers mix in time-release fertilizer as well.

(d) Water the plant thoroughly after transplanting. You may want to add vitamin B1 and rooting hormone to the water to help buffer transplant shock and stimulate growth of the roots. You may also want to add Banrot or some other fungicide to the water to help prevent root rot during the transplanting period. .

(e) Be careful when working with sphagnum moss. Be sure to use good clean moss. There is a disease that you can get from handling old mouldy moss. Be sure to wash your hands after you finish working with the moss.

5. Water each plant according to need, not according to schedule. This will usually mean less water in the winter as growth slows down and the roots take up less water.

   If you are on a drip system, you can vary the water delivered to your plants during each watering by choosing emitters which provide more or less water. Be sure to check your emitters occasionally to ensure that they are not clogged and change the emitters as the plants are transplanted into larger pots.

   Remember, experts estimate that 90% of plants killed by amateur growers die from overwatering.

6. If you have smaller plants, cluster similar small plants together. This helps them maintain humidity and moisture and keeps them from drying out as quickly.

7. Fertilize lightly, but often. Usually, during the growing season, you can fertilize each time you water if you use an extremely dilute fertilizer solution. Many professional growers have their automatic systems provide a very small amount of fertilizer during each watering. If you don't feel you have the time (or the inclination) to fertilize this often, you might try a time-release fertilizer like Osmocote. These can last six months to a year. Don't fertilize with both a time-release fertilizer and fertilizer in your water, as over fertilizing can kill a plant.

8. Check the plants often for signs of pests or disease. The earlier you spot pests the easier they are for you to control.

   The biggest year-round problems for ferns are snails, slugs, and sow bugs (pill bugs). They all love those tender fern fronds. For snails and slugs, you may want to put out slug bait or (for a more environmentally conscious approach) you can include diatomaceous earth in your plantings and fern beds. The sharp pieces of diatom skeletons dissuade the snails and slugs. For pill bugs and sow bugs, Diazanon crystals seem to work.

   Other common fern insect problems include aphids, thrips, mealybug and scale. Many of these insects are "farmed" by ants, so part of your solution may include controlling the ant populations in your yard.

   Aphids you can spray off with a directed stream of water or control them with a very dilute spray of liquid Sevin (carbaryl). Remember to look again in a week or so, as any eggs you left behind will hatch out.

   You can also use Cygon or Orthene (or other systemic insecticide which kills the suckers when they suck) to control sucking insects. Make up a very dilute systemic solution and place the plant all the way into the solution for 15-20 minutes.

Keep the dead and dying fronds trimmed back and cleaned out. This can help keep the insects that may have killed the fronds and over-eager natural sanitation forces (such as pill bugs and sowbugs) out of your plants. This will also allow more air through the plant, reducing mould and rot, and give new fronds more room to grow. You also want to keep the natural debris cleaned away from your ferns to limit the hiding and breeding places for pests and diseases.

10. If a plant is dying back at an unusual time (make sure to check on the plant's normal growth habit), check the container for signs of overwatering and salt buildup. If overwatering is the problem, you can cut down on the water or, if appropriate, try replanting the plant in a looser planting mix.

    If overwatering is not the problem, check the root ball to ensure that water can get to the roots or if you have extensive soil loss. If the plant is rootbound (too many roots in the container can make it nearly impossible for water and nutrients to reach most of the roots), you can take the plant out of the container and replant in a larger one. In the process, you may want to gently work some of the roots free of the root ball and spread them out in the container in the new soil just below the surface.

    If you have extensive soil loss, you may want to transplant into a larger container or you may want to remove as much of the soil as you easily can in the current container and repot the plant in new soil in the same container.

    For hanging plants in moss-filled baskets, soil loss can also be a problem. Check the bottom and sides of the plant to see if there are holes in the moss. If you find holes, fill them with fresh moss packed tightly.

11. Enjoy your new plant!

# RESEARCHING YOUR NEW PLANT(S)

**Robin Halley**

There was an article two months ago about what to do with your new fern when you bring it home. That topic was further discussed at the most recent Fern Society meeting . In that process, the importance of doing your homework became even more apparent.

Although you must, of course keep your plant watered and protected after you get it, I believe the first thing you do is find out as much about the new plant as you can. To do this you need to research two things: (1) the plant in its natural habitat and (2) the plant in its new habitat.

## The Plant in Its Natural Habitat

For this research you need to go to two sources: (1) books on ferns and, if you have the luxury, (2) people who know how the plant grows in nature. For the first, the Fern Society library has many splendid books about ferns from all around the world. For the second, we have several very knowledgeable fernists and, through our network with other Societies, you can get the names of fern growers who can tell you more.

As you do your research, there are some fundamental questions you need to ask about how the plant grows.

**(1) What kind of sun and air does the plant get** (where to put your new plant)?

Noting that a plant grows out in the open or under a tree canopy can often be misleading, depending on how hot the sun is and how much water is in the air. When you compare a plant growing in the open in a cloud forest and a plant growing in partial shade in the desert, you can find that the plant in partial shade is under greater stress.

There is often a large variability regarding the amount of sun or shade a plant prefers and will tolerate. My first concern about sun is that I don't want to put a plant where it is getting so much or so little sun that it will die.

If a plant is getting too much sun, the fronds may sunburn or the ground may dry too quickly and the

roots will die. If the plant is getting too little sun, it may not be able to produce enough chlorophyll or the ground may stay too wet, drowning the roots.

Your next concern about sun is more a matter of a fine tuning. How do you want your plant to grow? The amount of sun can affect the number, length, colour, and growth habit of the fronds. For example , with some species of Platyceriums, low light levels can result in darker green fertile fronds which tend to droop, whereas with higher light levels the fronds will be a lighter green but the fertile fronds will tend to be more upright.

Water in the air and the temperature of the air also have a large effect on how a plant grows. The air can be dry, moist, humid. It can be cold to hot. It can be still or moving. If the air is humid, there is likely to be (1) more protection from the sun and (2) more plant life providing shade. However, in tropical areas, when you get into higher altitudes, the air cools down, sometimes creating a cloud forest. Plants from higher altitudes in the tropics often transplant well to sea level in more temperate latitudes.

Knowledge about the amount of humidity and the temperature of the air, as well as air movement, will help you decide where the plant needs to be placed, whether it will need protection from the prevailing winds, if the plant needs to be brought in during the winter, and even if the fern needs to be put into a terrarium or humidity house.

Let's use five ferns as examples. From Jones' and Hoshizaki's books we find:

- *Asplenium australasicum* -- Low light, tropical-temperate (very adaptable)
- *Osmunda regalis* -- Low light, temperate-tropical (adaptable)
- *Davallia fejeensis* -- Low to high light (lots of range = options), tropical-subtropical
- *Marsilea drummondii* -- High light, temperate-subtropical
- *Cheilanthes covillei* -- High light, temperate

References to tropical, sub-tropical and temperate usually reflect the typical combination of humidity and heat found in those latitudes. However, again, remember that a plant from the mountains and a plant from the coast in the tropics can have very different environments.

**(2) How much water** (how to water, what kind of pot) ?

Almost all the experts agree that more plants are killed by overwatering than underwatering! However, overwatering to one plant may be underwatering to another. Additionally, plants get their water in different ways. Ferns which live in the cloud forests may get most of their water from a constant bath of mist. Ferns which live in Indonesia may get huge amounts of water part of the year (monsoon) and then virtually no water the rest of year. Ferns from the lake or pond margin may need to adapt to growing both underwater and at the water's edge. Ferns from the desert must adapt to getting water from the dew running off rocks.

All of these circumstances will dictate some things about how much and how often you water a particular fern, and how you apply the water. You can also learn important clues about how to plant the fern (pot, basket, terrarium, etc.) based on how you need to water the plant.

- *Asplenium australasicum* -- Moist ("Can be grown ... in a dryish position")
- *Osmunda regalis* -- Moist-wet
- *Davallia fejeensis* -- Moist-dry
- *Marsilea drummondii* -- Moist-wet, wet, aquatic
- *Cheilanthes covillei* -- Moist-dry (grows in the desert)

**(3) What kind of soil** (maybe on rocks or trees!!) ?

Ferns can grow in many kinds of soil or nearly no soil at all. However, the kind of soil a particular fern species prefers will help you know more about how to plant it. Although most fern soil mixes are based on about 1/3 peat moss, 1/3 perlite or vermiculite, and 1/3 compost (fir bark, redwood shaving, etc.), for terrestrial plants, the ratio can vary and there can be other ingredients you may want to add (sand, rock, a particular mineral such as lime) depending on a fern's natural soil.

For ferns which are epiphytic (grow on other plants) or epipetric (grow on rocks) you may want to know more about the plant's growing habit than about the soil. Does the plant creep or climb? Does it grow in notches of the tree which accumulate leaves and other debris or does the plant gather its own organics by developing humus collecting fronds?

The answers to these questions will tell you not only about the type of soil (loose, sandy, rocky, etc.) but, if you're putting the plant in a pot. more about what kind of pot to choose.

- *Asplenium australasicum* -- Terrestrial-epiphytic (potting mix)
- *Osmunda regalis* -- Terrestrial, dense clumps along water's edge
- *Davallia fejeensis* -- Epiphytic on trees and mossy boulders
- *Marsilea drummondii* -- Grow in temporary pools
- *Cheilanthes covillei* -- very open mix, unimpeded drainage

**(4) What kind of roots** (type of pot or where to plant) ?

In many ways, it is difficult to separate your research on soil from your research on roots. How ever, it is important to concentrate on both.

Ferns, in general, have shallow roots. There are, of course, some important exceptions. Knowing about how the roots grow and how quickly they grow can help you know some things about the kind and size of pot or mounting to choose and how often the plant may need to be repotted.

As a general rule plants which are epiphytic or can be epiphytic, such as *Nephrolepis* or *Davallia*, have their roots right at the surface. This means you can make them into basket plants or plant them in shallow soil or a shallow pot.

At the other end of the spectrum, *Cheilanthes* (and other ferns from dry situations) tend to grow long deep roots (to get water). This means they need a bigger, deeper pot or need to be more widely separated.

- *Asplenium australasicum* -- Very limited roots, can grow six-foot fronds from within a six-inch pot
- *Osmunda regalis* -- Extensive roots, possibly to help hold the plant in place at water's edge
- *Davallia fejeensis* -- Short roots, epiphytic
- *Marsilea drummondii* -- Medium roots, creeps
- *Cheilanthes covillei* -- Relatively long, deep roots

**(5) What should the plant look like when it's healthy**?

When we grow our ferns, we often start with a single little fern. We have no idea of how big the fern grows or how it grows. It's important to know that *Osmunda regalis* can grow to be 10 feet tall (not in my yard...), that *Asplenium australasicum* can grow 7 -8 foot fronds, that most *Dryopteris* form clumps, that most *Nephrolepis* run, that *Blechnum penna-marina* gets no more than six-inch fronds (at best), but that it's dimorphic (distinctively different sterile and fertile fronds).

The more you find out about the growing habit of your plant, the better decision about where to place the plant, what kind of container to use, how to water, etc. By doing this research you can find out that many California plants (where it rains November to March) will be deciduous from May to December while most other plants experience their strongest growth.

**(6) How does the plant get its food, how much and what kind**?

Knowing how to fertilize your plant is very important. By researching your plant's natural food collection process, you can know better how and when to feed your plant.

- *Asplenium australasicum* -- Uses fronds as humus collectors, gets food from decomposition of leaves
- *Osmunda regalis* -- Gets food from the water supply, natural breakdown of organic material at water's edge
- *Davallia fejeensis* -- Gets food from decomposition of leaves
- *Marsilea drummondii* -- Gets food from the water supply, natural breakdown of organic material at water's edge
- *Cheilanthes covillei* -- Adapted to very scarce nutrition; "normal" levels of fertilizer will kill this plant

**(7) Does the plant have special needs or dislikes** ? ---the back of Jones' Encyclopedia is a very good source

There are many examples of plants with special needs. One example is English ferns. Many grow in mortar on walls, and they do best if they have lime in their diet. However, *Blechnum spicant* HATES lime. Add lime and the plant usually dies!
Some plants, such as *Adiantum formosum*, are heavy feeders. Other plants, such as many *Cheilanthes*, must be fed very sparingly,

**The Plant in Its New Habitat**

Once you've researched how the plant grows in the wild, you need to find out how the plant grows where you live. Many plants are very adaptable or may have a different growing habit, depending on their new surroundings.

You need to find out more about your limits. You can do this by getting several of a single kind of plant and trying it many different places, with different water, food, and sun. A lot cheaper way is to ask the people in your group who know. Every group of which I know has a few braver souls who have studied ferns and are willing to experiment. They have learned things you need to know. Ask them! When you come to a meeting, bring your questions. That's part of what fern societies are about.

You'll want to know how and where they have grown your new fern. Ask the experts:

- how big will the fern get?
- what colour can you expect it to be?
- how often do they repot?
- what fertilizer do they use?
- what special things they have to do to make the fern grow where you live.

For example, every year many of us get ferns imported from Mexico and try to grow them. After doing the prescribed research, I try to recreate the environment in which the plant grows naturally. I have a little "humidity house" and most of the plants go in there. Bob Halley thinks that is a lot of work and immediately plants most of his new ferns outside, gives them the best care he can, and sees what lives. Ed Bates leaves some ferns in the plastic bags in which we bought the ferns for up to five months, then hardens some off to the San Diego weather and puts some in terrariums. We each have some success and we each share the knowledge. That's how I found out that *Polypodium rhodopleuron* grows more happily outside than in a humidity house.....

Happy research.


**Asplenium hookerianum var. colensoi**

# SPORE LIST

**Ordering:** The following spore is now available and is free to those who donate spore. Otherwise the charge is 20 cents each sample for members and 50 cents for non-members, plus $1.00 to cover packing and postage. Available at meetings or by mail from Barry White, 24 Ruby St., West Essendon, VIC. 3040 - Phone (03) 337 9793. There is no charge for overseas members but to cover postage two International Reply Coupons would be appreciated.

A booklet on spore collection and cultivation is available for 40 cents, or free to spore donors.

ADIANTUM concinnum 6/94
ADIANTUM hispidulum 8/94
ADIANTUM raddianum 'Legrand Morgan' 6/94
ANEMIA mexicana 7/94
ANEMIA phyllitidis 08/94
ARACHNIODES simplicior 05/94
ASPLENIUM bulbiferum ssp.gracillimum 2/94
ASPLENIUM flabellifolium,large pinnae 09/94
ASPLENIUM milnei 7/94
ASPLENIUM oblongifolium 7/94
ASPLENIUM obtusatum 7/94
ASPLENIUM scleroprium 1/94
ASPLENIUM scolopendrium 1/94
ASPLENIUM varians 7/94
ATHYRIUM niponicum var. pictum 4/94
ATHYRIUM niponicum 'Metallicum' 8/94
BLECHNUM fluviatile 6/94
BLECHNUM sp.(West of Newcastle) 9/94
BLECHNUM watsii 5/94
CAMPYLONEURON angustifolium 1/94
CHEILANTHES austrotenuifolia 11/93
CHRISTELLA parasitica 1/94
CHRISTELLA subpubescens 11/94
CIBOTIUM regale 4/94
CIBOTIUM scheidii 09/94
CONIOGRAMME intermedia 1/94
CULCITA dubia 09/94
CYATHEA australis 5/94
CYATHEA brownii 4/94
CYATHEA cooperi 1/94
CYATHEA cooperi 'Brentwood' 11/94
CYATHEA cooperi (Blue form) 11/94
CYATHEA felina 11/94
CYATHEA robertsiana 11/94
DICKSONIA antarctica 5/94
DOODIA aspera 1/94
DOODIA maxima 1/94
DRYNARIA sparsisora 4/94
DRYOPTERIS affinis 'cristata' 1/94
DRYOPTERIS atrata 1/94
DRYOPTERIS dilatata 10/94
DRYOPTERIS erythrosora 1/94
DRYOPTERIS filix-mas 'Barnesii' 7/94
DRYOPTERIS sieboldii 1/94
DRYOPTERIS wallichiana 1/94
ELAPHOGLOSSUM sartorii 08/94
FADYENIA hookeri 4/94
GLEICHENIA microphylla 09/94
GYMNOCARPIUM oyense 7/94
HEMIONITIS arifolia 08/94
LASTREOPSIS microsora 09/94
LLAVEA cordifolia 4/94
LYGODIUM japonicum 11/94
MICROSORUM diversifolium 7/94
MICROSORUM parksii 7/94
PELLAEA cordifolia (Texas) 4/94
PELLAEA falcata 08/94
PELLAEA quadripinnata 4/94
PELLAEA rotundifolia 08/94
PLATYCERIUM superbum 11/93
POLYSTICHUM australiense 11/94
POLYSTICHUM lentum 4/94
POLYSTICHUM tsus-simense 4/94
PTERIS argyrae 7/94
PTERIS biaurita 5/94
PTERIS comans 09/94
PTERIS cretica 'Parkeri' 1/94
PTERIS macilenta 7/94
PTERIS sp. (Nepal) 3/94
PTERIS tremula 1/94
PTERIS umbrosa 4/94
PTERIS vittata 1/94
PYRROSIA angustata 05/94
RUMOHRA adiantiformis (Cape form) 10/94
STENOCHLAENA tenuifolia 7/94
THELYPTERIS navarrensis 4/94
WOODWARDIA orientalis 08/94

## SPORE WANTED

The spore list is shorter this month because I have removed all spore collected prior to 1994 except for two lots which still have good germination. Fresh spore is urgently needed. Please help if possible.

# BUYERS' GUIDE TO NURSERIES

## VICTORIA:

**Andrew's Fern Nursery / Castle Creek Orchids** - Retail. Phone (058) 26 7285
Goulburn Valley Highway, Arcadia, 3613 (20 km south of Shepparton).
Large range of ferns and orchids for beginners and collectors. Open daily 10am - 5pm except Christmas Day.

**Austral Ferns** - Wholesale Propagators. Phone (052) 82 3084.
Specialising in supplying retail nurseries with a wide range of hardy ferns; no tubes.

**Coach Road Ferns** - Wholesale. Phone (03) 756 6676. Monbulk 3793.
Retail each Saturday and Sunday at Upper Ferntree Gully Market (railway station car park), Melway Ref. 74 F5.
Wide selection of native and other ferns. Fern potting mix also for sale.

**Fern Acres Nursery** - Retail. Phone (057) 86 5481. Kinglake West, 3757.
On main road, opposite Kinglake West Primary School. Specialising in Stags, Elks and Bird's-nest Ferns.

**Fern Glen** - Wholesale and Retail. Phone (056) 29 2375.
D. & I. Forte, Garfield North, 3814. Visitors welcome.

**R. & M. Fletcher's Fern Nursery** - Retail. Phone (059) 64 4680.
62 Walker Road, Seville, 3139. (Look for sign on Warburton Highway, 300m east of Seville shopping centre).
Closed Tuesday, except on public holidays.

**Kawarren Fernery** - Wholesale and Retail. Phone (052) 35 8444.
Situated on the Colac - Gellibrand Road, Kawarren (20 km south of Colac).

**The Bush-House Nursery** - Wholesale and Retail. Phone (055) 66 2331
Cobden Road, Naringal (35 km east of Warrnambool). Ferns - trays to advanced. Visitors welcome.

## NEW SOUTH WALES:

**Jim & Beryl Geekie Fern Nursery** - Retail. Phone (02) 484 2684.
6 Nelson Street, Thornleigh, 2120. By appointment.

**Kanerley Fern Exhibition and Nursery** - Wholesale and Retail. Phone (049) 87 2781.
204 Hinton Road, Osterley, via Raymond Terrace, 2324.
Closed Thursdays and Saturdays. Groups of more than 10 must book in advance, please.

**Marley's Ferns** - Wholesale.
Phone (02) 457 9168.
5 Seaview Street, Mt. Kuring-Gai, 2080.
All Fern Society members welcome. By appointment.

## QUEENSLAND:

**Moran's Highway Nursery**
Wholesale and Retail.
Phone (074) 42 1613.,
Bruce Highway, Woombye (1 km north of Big Pineapple; turn right into Kiel Mountain Road).
P.O. Box 47, Woombye, 4559.