

**THE  
FERN SOCIETY  
OF  
VICTORIA**

**Inc.**

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# **NEWSLETTER**

**VOLUME 20, Number 2**

**March / April, 1998**



# **FERN SOCIETY OF VICTORIA Inc.**

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Subscriptions fall due on 1st July each year.

Meetings are held on the third Thursday of each month except January  
at Victoria Bowling Club, 217 Grattan Street, Carlton. Melways 2B D8.

## **OUR SOCIETY'S OBJECTIVES.**

The objectives of the Society are;

- \*to bring together persons interested in ferns and allied plants
- \*to promote the gathering and dissemination of information about ferns
- \*to stimulate public interest in ferns and
- \*to promote the conservation of ferns and their habitats.

## **PRESIDENT'S MESSAGE**

For our first General Meeting for 1998, we enjoyed the company of Geoff Beilby, a retired National Parks Ranger from the Otway National Park. Geoff spoke on the rainforest plants of the Otways, especially in the Triplet Falls area of which his talk was very informative, and has inspired Lorraine and I to have another look at them.

Our friend Martin Rickard from the British Pteridological Society arrived on the 6th February, 1998 for a rushed eight day fern tour of Victoria.

We spent the first day, Saturday looking at our ferns and Martin was able to help us with quite a few identifications of British ferns. Sunday, we visited Fernworld in the morning and then met up with a few Fern Society of Victoria members at Rippon Lea for a tour of the fernery. Martin was very impressed and in the late afternoon we visited the Botanic Gardens in Melbourne, for a stroll through the fern gully.

On the Monday, we left early and met with Barry White at Dorothy and Ian Forte's farm in Garfield North. We spent the morning admiring Dorothy's ferns and in the afternoon we headed for the Tarra Valley and Bulga Park, where we spent a very enjoyable few hours in paradise.

(Continued on page 27)



# 1998 MEETINGS & EVENTS

GENERAL MEETING - 19th March at 8 p.m.



## THE WORLD OF TREE FERNS

with Neil Shirley

We are pleased to be bringing Neil over from South Australia to speak to us. Tree ferns are his greatest horticultural passion and he has much to share with us. We look forward greatly to hearing him.

EXCURSION - Sunday 29th March at 11.30 a.m.



## GARFIELD NORTH AND GLEN NAYOOK

Meet at Dorothy and Ian Forte's farm at beautiful Garfield North (Vicroads Country Directory 96 C/D3 or Melways 512 S6), enjoy BYO lunch there and then proceed to Glen Nayook.

GENERAL MEETING - 16th April at 8 p.m.

## THE GOUDEYS' TRIP TO U.S.A.

Chris will show portions of the videos taken on their trip. Wonderful!

Also that night;

## THE B.P.S. VIDEO ON FERNS OF BRITAIN

on temporary loan from Martin Rickard. Very interesting.



SHOW - April 18th - 19th

## OUR ANNUAL FERN SHOW

New venue - new features - new partner...and ferns, ferns, ferns! This year's Show has all the ingredients for success. Don't miss out on being part of this great weekend. It would be good to meet our out-of-town members. Access is by rail, bus or car (generous parking area).

### GENERAL MEETING TIMETABLE:

7.30	Pre-meeting activities - Sale of ferns, spore, books, merchandise and Special Effort tickets. Also library loans.
8.00	General Meeting.
8.15	Workshops and demonstrations.
9.15	Fern identification and pathology, Special Effort draw.
9.45	Supper.
10.00	Close.



## MONTHLY COMPETITIONS:

MARCH

A Tree fern.

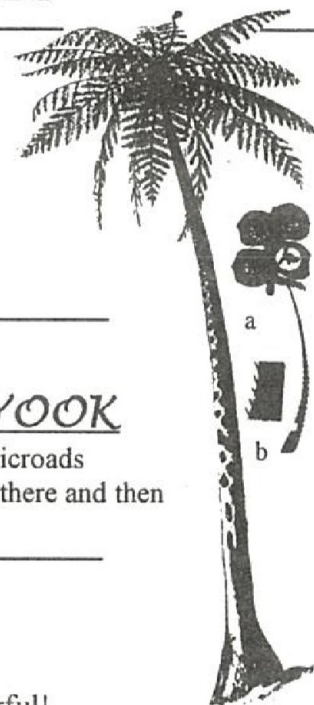
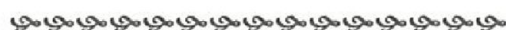
APRIL

An interesting fern.

(If you're interested in it, it's suitable)

MAY

A fern ally.



*Cyathea medullaris* - "Mamaku" or "Black Tree Fern" (a) sort partly covered with an indusium, (b) margin of scales toothed.



## THE FERN SOCIETY VISIT TO RIPPON LEA WITH MARTIN RICKARD.

When Chris and Lorraine Goudey visited Rippon Lea (among other fernish places) with their guest, Martin Rickard recently, four other members met them at the Fernery and we spent a pleasant couple of hours together. Martin is the president of the British Pteridological Society and it was a rare treat to get to know him a little. My impression is of a pleasant and friendly man who loves ferns, particularly tree ferns, and is far more interested in learning about them than in his own importance. He's fast on his feet, though! If we paused for a chat he quickly disappeared and was lost in the wonderful 'jungle' that is Rippon Lea's fernery.

The hour scheduled for this visit was stretched considerably as we found the place very interesting. Those of us who had not visited for some time were pleasantly surprised at the variety of ferns still growing happily and the overall lush appearance of this area. Also surprising was the great number and variety of insects apparent on the ferns. Though showing some damage from the pests they were supporting, the ferns were generally coping remarkably well - due to the ideal growing conditions they enjoy, I'm sure.

Labelling on the ferns would make a visit to the fernery much more interesting and educational. One thing that is interesting and educational is a well-written pamphlet, "Rippon Lea Fernery ; Introductory Walk & Observation Guide". Written by the Gould League of Victoria Inc. for the National Trust, it contains a brief introduction and history followed by the observation guide and some information on ferns and associated plants. For a copy of this excellent publication, visitors are directed by a sign in the fernery to the mansion, which is usually locked, but I was kindly sent a copy by the receptionist at the gatehouse (entrance/shop). It may be as well to enquire about it on the way in if you visit.

Rippon Lea was designed in 1868 and building began soon afterwards. Originally of 15 rooms set in 11.3 hectares of land, by the turn of the century it had expanded to a mansion of 33 rooms in 17.4 hectares of grounds. A sophisticated irrigation and drainage system transformed the bleak landscape of rough bushland into formal flower gardens, orchards, vegetable gardens and paddocks. Gradually pleasure gardens and state-of-the-art conservatories, glasshouses and The Fernery were added.



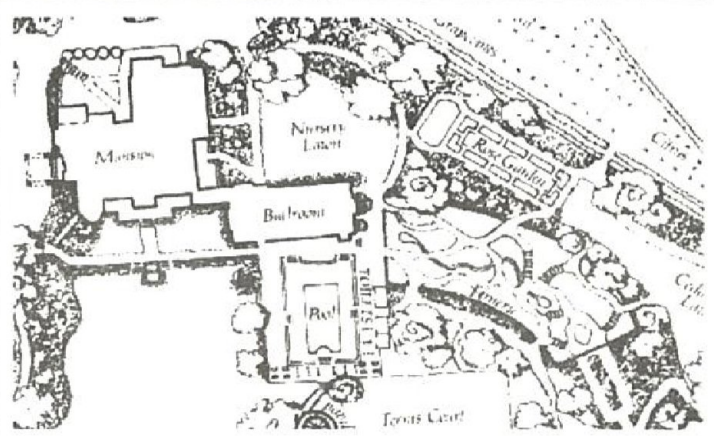
Interior of Rippon Lea Fernery. *The iron arches and the curve of the structure are visible at the top.*  
-Photograph by Chris Goudey.



Erected in about 1884 by Sir Frederick Sargood, a prominent businessman and politician, the fernery is over 50 metres long, nearly 14 metres wide and over 10 metres high. It is a curved structure constructed of a framework of arching iron girders supported by over 50 cast iron columns. Shade for the plants inside is provided by timber slatting attached to the frame. At present quite a lot of the timber slats which cover the fernery have come undone at one end and are protruding outward. The whole slatted roof appears to be in urgent need of attention and repairs made where necessary, in order to prevent the need for a huge and expensive renovation in the future. I hope it is done. It certainly would be a great loss to the nation if it was ever decided that this, probably the greatest private fernery ever created, was uneconomic and had to go.

It is with interest that I discover that Sir Frederick also had built another fernery nearby on the estate almost on the same scale as this one for the cultivation of more tropical ferns. Sadly no trace of this remains today though some very early photographs are displayed in the house.

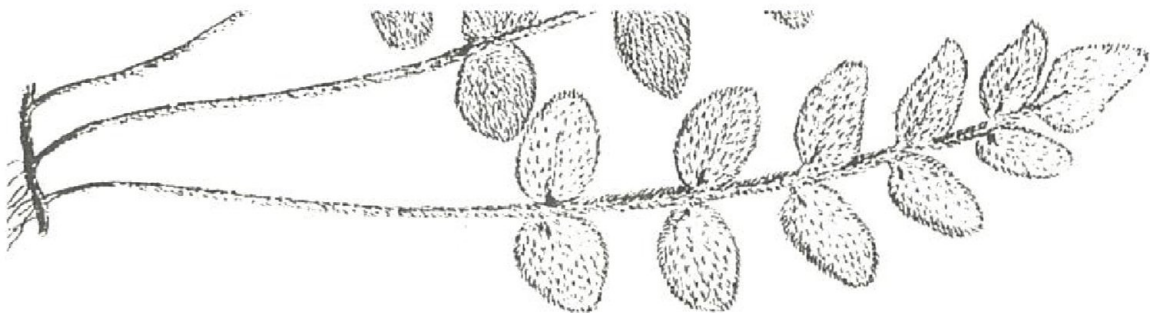
During my stroll around 'the rest of the gar-



Rippon Lea mansion and portion of the grounds. The Fernery is the curved structure on the Right.

den', I came across two florists at work. Dressed in bathing costumes, they were trying with polite desperation not to drown in full view of the public as they arranged flowers on the surface of the deeper-than-they-thought Rippon Lea swimming pool in preparation for a function. Reminded me of a few politicians I know of..... but I digress.

They succeeded. A bit of an anticlimax, really. But the spectacle has definitely gone into the 'memories of Rippon Lea' file alongside the wonderful Fernery!



*Paraceterach muelleri*, a resurrection fern from North-eastern Queensland, has upright to pendent fronds to 30cm. It grows in colonies on rock faces and dry, open areas along streams. Difficult to establish in cultivation.

## **FERN COMPETITION RESULTS**

### **FEBRUARY GENERAL MEETING**

#### **COMPETITION CATEGORY:**

##### **A Fern or Ferns in a Hanging Container**

1. *Pyrrosia lingua* Don Fuller
2. *Polypodium cambricum* Margaret Radley
3. *Davallia plumosa* Gaye and Barry Stagoll

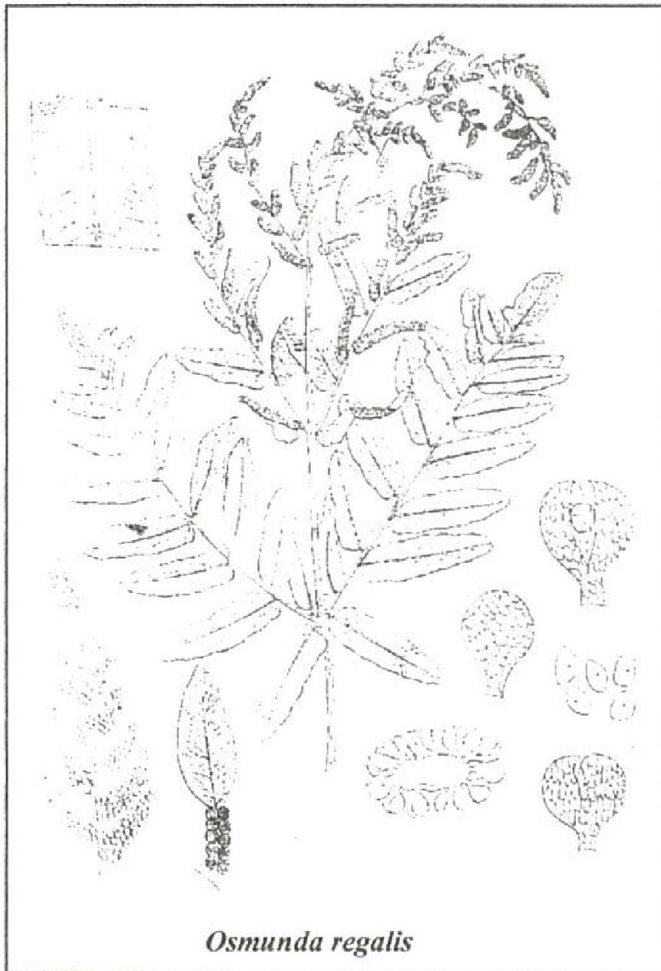
EXHIBITORS' DRAW: John Hodges

SPECIAL EFFORT: Dorothy Forte, Norma Hodges,  
Fran Harrison, Lyn Gresham.



## OSMUNDA REGALIS - THE ROYAL FERN

The following article is taken from the Western Australia Fern Society's magazine of December 1995 and is reproduced with thanks. The illustration is from "The Ferns of Southern India".



*Osmunda regalis*

If you appreciate ferns for the same reason I do - the intense *alive* sensation they seem to exude during their growing time, and the majestic appearance of a mature specimen, you'll probably find the *Osmunda regalis* or 'Royal Fern' a particularly rewarding plant.

The Encyclopaedia of Ferns lists the *regalis* as being native to Europe, Asia, North and South America and Africa, preferring to grow in very wet areas and produc-

ing fronds of up to 3 metres in length. It also lists two fertile cultivars, *Crispa* and *Cristata*, although it is well accepted that there are two versions of the standard *O. regalis* to be found here (one with pinkish margins and one with green), I don't know of anyone with either of these cultivars.

In our climate, *Osmunda regalis* appears very happy to grow in a fibreglass covered and protected area. While it tolerates a pot, it doesn't reach a shade of its full potential unless given a ground location and plenty of room. In this situation it forms a slowly increasing clump and provides one of the early signs of spring as it fires into life. Each crown in the clump sends up between six and twelve croziers with cane-like stalks which grow so fast they can add around 15cm to their height in a day - you can almost see them rising!

The croziers may reach nearly a metre in height before they start to form any of the secondary rachis. The upward growth usually keeps going until the fronds are more than 2 metres in height. At this point, many of the tallest frond develop a cluster of sporangia at their tip (which does give the impression of a crown, but I don't know if this has anything to do with the fern's common name). As with other *Osmundas*, the spore is green and really has to be set in a matter of days to ensure success.

The fully developed fronds attain a stately and precisely ordered appearance which lasts throughout the summer (although I find they need some support to stop them spreading outward over open areas) and seems relatively free from the usual pests and wogs. Although deciduous in cold climates, in the conditions described above the fronds simply get progressively rattier as autumn sets in, until it is time to chop them off at ground level ready for next spring.

As far as entertainment value for effort required goes, I'd give this fern a rating of 10/10. ~

### FERN SURVIVAL IN SUMMER.

#### Summer Watering.

Taken with thanks from the Los Angeles International Fern Society's *Fern Journal*, Vol. 24, No.4 June '97.

Here are a few tips to preserve your ferns during the summer season.

Water deeply and mulch terrestrials. Mulch can be woodchips, shredded tree bark, composted garden cuttings or sawdust from untreated wood.

On hot days you can replace transpiration from foliage by watering the aerial roots on tree fern trunks.

Group potted plants together. If you place them around or under a tree fern, they will be easier and

quicker to water. The humidity zone you create will help counter the plants' higher summer rate of transpiration.

Similarly you can provide a humidity zone for hanging plants. Place them above a hedge or any group of terrestrials. Transpiration from these plants will humidify the air around the hanging plants. This and adequate protection from all but early morning and late afternoon sun, will help hanging baskets survive the hottest days of summer. ~



# ***FERN SHOW 1998!***

***(Combined Fern and Vireya Rhododendron Show)***

***Saturday 18th April - Sunday 19th April  
Mt Waverley Community Centre***

OUR 1998 SHOW is fast approaching and I hope everyone has commenced the selection and preparation of their ferns for the competition and display. Details of the Fern Competition categories were given in the January newsletter - it would be great if everyone could enter at least several ferns in the competition.

OUR FEATURE DISPLAY this year is the genus *ASPLENIUM* and we hope to be able to present a very wide range of these ferns. So in addition to bringing in your favourite *Aspleniums* please hunt out those more uncommon species.

Please ensure that you ferns are CORRECTLY LABELLED with their botanical and possibly common names and with some means of identifying the owner. This will almost guarantee their safe return to you.

We plan to COMMENCE SETTING UP the show as soon as possible after 12.00 noon on Friday 17th April and should be able to start accepting ferns for both the

display and sales by approximately 2.00 p.m. The committee will be very glad to hear from those able to assist in setting up on this day. We are also still seeking people to HELP WITH THE SHOW especially DEMONSTRATORS and helpers with the LIGHT REFRESHMENTS.

If you need to bring your ferns AFTER 6.00

p.m. on the Friday or EARLY ON SATURDAY, please contact Don Fuller (9306 5570).

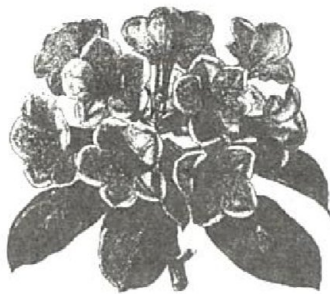
Those wishing to SELL FERNS are reminded that they must contribute to the display and/or competition and that they need to obtain a "booking-in" form from Bernadette Thomson (9399 1587).

ADMISSION to the Show is \$3 and concession \$2. However, those who contribute to the competition or display or act in an official capacity for a day will be admitted free.



We will need in the Sales area a large number of CARDBOARD BOXES for packing ferns. If you can collect up a few (or a lot) it will be much appreciated. Bring them with you on Friday or anytime during the Show.

The Show is very important to our Society so we seek the full support of our members. Please PUBLICIZE it wherever and whenever possible and come along and contribute to it. The two ENCLOSED FLIERS are provided for you to promote it in your community. Additional fliers will be available at the March meeting or by contacting Don Fuller. If you can get them displayed in public places (garden centres, libraries etc.) it would be preferable that it not be done before the last week in March. And don't forget to give our Show a mention at your Garden Club's March meeting. ~





# FAIRY DELL

Barry White

Fairy Dell is a small but interesting fern area a few kilometres outside Bruthen in Eastern Victoria. It is the most westerly site in Victoria of *Cyathea leichhardtiana* (Prickly Tree-fern) and *Pteris umbrosa* (Jungle Brake). It is also one of the most westerly sites of *Pyrrosia rupestris*.

Martin Rickard, president of the British Pteridological Society and an avid tree-fern person, Chris Goudey and myself visited the Dell in February of this year. The area was obviously suffering the from the effects of the prolonged drought but in the central area the soil was still moist and the ferns were growing strongly.

The turnoff to Fairy Dell is about one kilometre west of Bruthen on the road from Bairnsdale. A six kilometre rough dirt road through dry bush leads to the picnic area, with a half kilometre walk to Fairy Dell, a surprising little fern area in the middle of dry bush. We counted 22 species of ferns as listed below. One needed to continue on up the creek past the Fairy Dell sign board to see some of the ferns, and in particular the *Pteris umbrosa* of which there were some good stands. Also of note was the large amount of *Microsorium scandens* with much of it as a ground fern, and the stands of *Blechnum cartilagineum*. The *Todea barbara* (some very large), *Blechnum nudum* and *Adiantum aethiopicum* were not observed in the main area but were seen by strolling a short distance up the dry creek bed from the bridge just at the start of the walking track.

## FERNS NOTED IN THE FAIRY DELL AREA.



*Todea barbara*

*Adiantum aethiopicum*  
*Asplenium bulbiferum*  
*Asplenium flabellifolium*  
*Blechnum cartilagineum*  
*Blechnum nudum*  
*Blechnum patersonia*  
*Calochlaena dubia*  
*Cyathea australis*  
*Cyathea leichhardtiana*  
*Dennstaedtia davallioides*  
*Dicksonia antarctica*  
*Diplazium australe*  
*Doodia media*  
*Histiopteris incisa*  
*Lastreopsis acuminata*  
*Microsorium scandens*  
*Pellaea falcata*  
*Polystichum proliferum*  
*Pteridium esculentum*  
*Pteris umbrosa*  
*Pyrrosia rupestris*  
*Todea barbara*

P.S. Mary Frost in the November '88 issue of the Newsletter also reported seeing *Microsorium diversifolium*, *Rumohra adiantiformis* and *Pteris tremula*.



# FROM THE INTERNET.....

## TOO TALL TREE FERNS...

(The following comments are extracted from "Fernet" on the Internet. "Fernet" is a medium for exchanging information on ferns. There is no charge for joining. To join, send the command:  
SUBSCRIBE FERNET First\_Name Last\_Name to: macjordomo@koning.ecsu.ctstateu.edu

We currently own a 10 foot Australian Tree Fern. Is it possible to cut back a tree fern to a shorter size and experience regrowth? If so, how can this best be done? We would very much appreciate your reply.  
Thank you for your time,  
Mr. Ybarra

Often tree ferns outgrow their ornamental location. What we have done when *S. cooperi* gets too tall is to 'lower' it. We do this by digging it up with as much root ball as is practical, deepening the hole to the depth that will allow us to drop it deep enough to be a manageable height, and planting the tree fern in this deep hole. Actually you can lower them this way almost all the way to the crown if you really want to. We haven't lost any doing this.  
Serge

Great idea! I suppose that once the Tree fern has re-established itself and the former stem hairs had "converted" to "roots" it would help with the overall health of the plant. I do remember seeing a show on ABCTV from the UK, which was about Victorian gardens, and the old head gardener actually showed the process of cutting down (what appeared to be a *Cyathea*) Tree Fern. He placed a divided pot around the stem about half-way up and filled it with a mix. After roots had established, he then cut half-way through the stem below the pot, left it for awhile to re-establish and then completed the cut. Finally, he repotted into a bigger pot. This is how I remember it going, but I might be wrong.  
regards  
Donna

Barbara Joe Hoshizaki describes a method of lowering tree ferns in her Fern Growers Manual pg. 100. I haven't heard of any successful attempts with *Cyathea cooperi*. *Cyathea australis* are sometimes cut off without roots and replanted. The success rate varies and depends on the environment, but this practice is not recommended. The best time of the year to experiment with downsizing would be Autumn when the tree ferns are actively growing roots rather than foliage.  
Regards,  
Les Vulcz

With *Cyathea medullaris*, I have found that cut trunks, if kept in a cool, damp, shady site, may grow. This applies to the tops. I don't know about the stumps, left in the ground. However, as we have a forked *C. medullaris* on our property, it would seem that this species does have some ability to regenerate if decapitated. Certainly, with *Dicksonia squarrosa* and *D. fibrosa*, often sold here as bare trunks for fencing, retaining walls etc. they often sprout and grow to give an attractive living fence.  
Nick Miller  
Rotorua, New Zealand

## TREE FERN DISEASE

Tree fern enthusiasts may be interested in a report that appeared in 'The New Zealand Herald' on Monday 28 July. Our national emblem, the silver fern (*Cyathea dealbata*) is threatened by a mystery disease that causes withering of the fronds, followed by death. It is suspected that the disease may be caused by a mycoplasma similar to that which has caused extensive losses among our native 'cabbage tree' (*Cordyline australis* - a non-fern monocotyledon) and has damaged other crops, both here and overseas. The disease is thought to be spread by leaf hopper insects, and causes death by choking the conductive tissues of the plant. Other tree ferns may also be at risk. Certainly in our garden, there have been sudden deaths of *Cyathea medullaris* and *C. cunninghamii* over the last few summers.

Nick Miller  
Rotorua, New Zealand



Opinions expressed in this Newsletter are the personal views of the authors and are not necessarily endorsed by the Society, nor does mention of a product constitute its endorsement.



The following article is taken, with thanks, from "LAIFS Fern Journal" 24, 1 (December 1996), a publication of the Los Angeles International Fern Society.

## LIGHT AND IT'S IMPORTANCE TO PLANT DEVELOPMENT

A Program Presented by Takashi Hoshizaki

Light is one of the most important factors for plant growth. Without light there would not be any plant life. Takashi Hoshizaki described different facets of light and how they effect plants. He also described how they respond to the intensity and different angles of light. The purpose of his lecture was to describe what light is and how plants respond to light.

There are different types of light sources. Natural and artificial light sources differ in their effect on plants.

Light is part of what is known as the electromagnetic spectrum. The whole spectrum runs from the low energy radio waves through broadcast radio waves to infra-red, visible light, ultra-violet to very high energy X-rays and gamma rays.

A beam of sunlight passed through a glass prism will be spread into a band of light with all the colors of the rainbow. These are all the colors that we human beings can see; they are a very small portion of the entire electromagnetic spectrum. Ultraviolet radiation from the sun cannot be seen but it affects us with its high energy by causing sunburn. X-rays and gamma rays are also high energy radiation that can damage human tissue. The gamma rays emitted from a nuclear reaction are the principal risk to humans from nuclear reactors when accidents occur. Visible light has just enough energy to cause a chemical reaction in our eyes so that we can see. It also causes chemical reactions in plants to make them grow.

Fire light and candle light are in the red-orange part of the spectrum and are not as energetic, or hot, as the blue flame of a gas stove. This illustrates the difference in energy of different colored lights. In photography, red "safe" lights are used in developing film because they do not have enough energy to expose, and therefore fog, the film.

Indoors we light our homes and businesses with fluorescent and incandescent lamps. Incandescent lamp bulbs produce light that is red to orange, colors that are of lower energy in the visible spectrum. Street lighting is often produced from metal halide lamps. These give an orange to yellow low-

energy light and are more economical than other lights.

Light can be filtered by passing it through various materials to change the characteristics of the light by altering the passage of the various colors. Plastic film can be obtained for greenhouses to filter out the infra-red rays that cause the green house to overheat and adversely affect the plant growth.

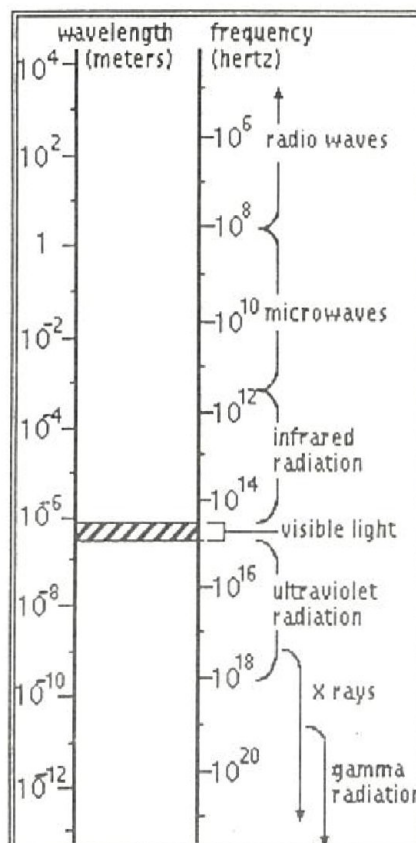
Bright sunlight is about 5,000 foot candles whereas the partial shade where some of our ferns grow might be 1,000 foot candles. Other plants do better in deep shade of about 500 foot candles. If the amount of light is lowered to 100 foot candles there is not enough light energy for photosynthesis to produce as much food as the plant needs. At this level the plant exists but is not really growing.

The plant structure will respond to light intensity and in too deep shade will have slightly larger leaves and in many cases thinner leaves. The plant is telling us that there is not enough light and spreads out more to capture as much light as possible. In full sun the leaves are smaller and thicker. In very deep shade or darkness the plant will grow if it has enough food reserve, but it will have no color and will appear almost white. The growth will be long and stringy and is in etiolated condition. The plant stretches out to find light sufficient to meet its needs. The table at the end of the article shows a number of different light sources under which plants are grown and the plant performance under each light source.

Light is used by plants to grow and adjust to their environments. We can look at light relative to its presence: how long the light has been shining on the plant during the day; which direction the light is coming from; the quality or color of the light - whether it has a great amount of blue or if it is red or green; and brightness or how strong the light source is. All of these factors combined will effect how the plant grows and develops.

### PHOTOSYNTHESIS

The word photosynthesis is derived from two Greek roots - *photo* meaning light and *synthetikos* meaning put together.



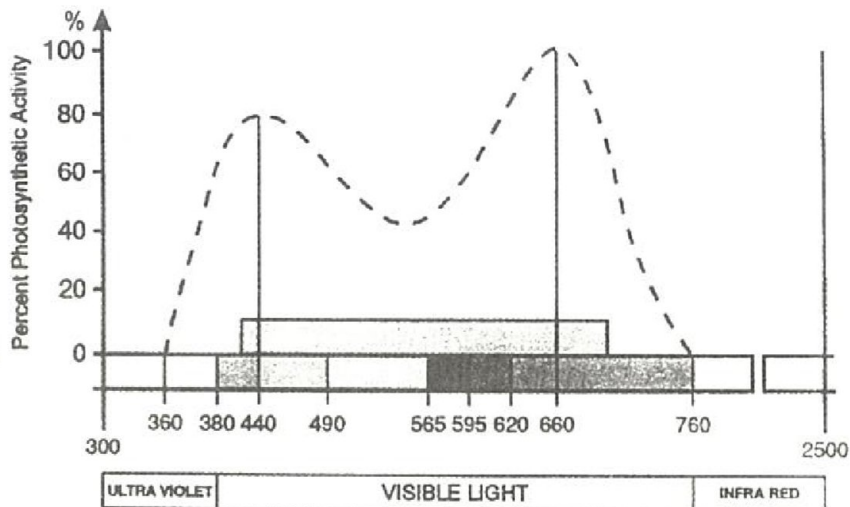
### Electromagnetic Spectrum

In order of decreasing wavelength and increasing frequency, the various types of electromagnetic radiation are radio waves, micro-waves, infrared radiation, visible light, ultraviolet radiation, x rays, and gamma radiation.

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Photosynthesis occurs when light shines on the plant leaf and the light energy is captured by the plant and converted into chemical energy in the form of food. Water from the soil is put together or combined with carbon dioxide from the air to form sugar molecules. The active molecule in photosynthesis is chlorophyll and responds best to red and blue light. When sunlight, having all the colors in the spectrum, falls on the plant, the red and blue light is absorbed in the photosynthetic process and the green light is reflected. That is why the plant appears green.



Plant response to light wavelength.  
Peaks occur at 440 in blue-violet and 660 in red.

### PHOTOPERIODISM

Photoperiodism refers to the length of time that the light shines on the plant each day (*photo* - light; *periodos* - cycle, time). Many responses of plants change according to the time of the year. In temperate zones the winter sun rises late and sets early, and daytime light is about ten hours. In summer there is about 14 hours of daylight.

Some plants can sense the change and actually measure the length of the time the sun is shining. In spring as the daylight hours grow longer, the spring flowering plants sense the change and produce flowers. There are other plants that can sense when daylight is getting shorter. These plants say 'Ah, fall is approaching and I must produce my flowers and seeds before the winter arrives'. Suppose you decide to plant a vegetable garden and delay setting out your vegetables a week or two. The tardy plants sense the delay and usually set fruit about the same time as if they were set out earlier.

In the eastern U.S., the broad-leafed plants sense that winter is approaching and growth ceases. At this time the green chlorophyll molecule begins to break down. Red and yellow pigments masked by the green chlorophyll still remain in the leaves. As the chlorophyll molecules disappear the red and yellow colors become apparent and the colorful fall foliage results.

In spring the dormant buds break and the tree starts to leaf out, not because the weather is warmer, but because the

length of daylight is getting longer. In the winter if there are some unseasonable warm days the tree buds may attempt to break but the daylight is too short and the tree does not leaf out because the growth is suppressed in short days.

Plant physiologists have discovered that the sensing of the length of day by plants is due to a molecule called phytochrome. In an experiment with ferns grown under fluorescent lamps, the plants responded with extra growth when the day length was increased by five hours.

### PHOTOTROPISM

Plants are affected by the direction of the light falling on them. Plants grow toward light. This effect is called phototropism (*photo* - light; *tropé* - turn). This motion is caused by the growth hormone called auxin. It causes the plant cells to elongate. Auxin is activated by blue light. When light falls on the plant the auxin concentrates on the dark side of the plant. The auxin concentrated on the dark side of the plant causes the cells to elongate. The dark side grows faster than the light side which results in the plant bending towards the light.

### PHOTONASTIC MOVEMENTS

A less permanent form of phototropism called photonastic (*photo* - light; *nastos* - pressed close) movement is illustrated by the sunflower that faces east in the morning and turns during the day to always face the sun. The question arose whether the sunflower returned to east-facing by continuing to turn clockwise. The flower actually oscillates back and forth. Other examples are the leaves of bean plants, Marsilea and Sensitive Plant that close at night.

Another photonastic response is the even distribution of leaves. Generally, you will not find a leaf directly above another. They tend to place themselves so that each leaf will be exposed to the sunlight. This distribution is known as a 'mosaic pattern'. If a plant is moved to a new location, after a few days it will have rearranged its leaves to receive the light more effectively.

### PHOTOMORPHOGENESIS

The shape of a plant may change as a result of the light that falls on it. This effect is called photomorphogenesis (*photo* - light; *morpho* - shape; *genesis* - birth). Seeds that are given proper light (especially red light), moisture and temperature will germinate. Those that are given no light at all will not germinate. If a garden is prepared by clearing away all the weeds and the soil is turned over, a new batch of weeds will be growing in a week or two. All of the seeds that had been buried under the soil and now have the benefit of sunlight quickly germinate. The leaf size and thickness is affected by the ratio of red to blue light. Plants grown in the dark (say,



grass under a board) are long and stringy with little or no green color. These plants are said to be etiolated.

Slides were shown to illustrate the electromagnetic spectrum and the effect of various frequencies of visible light on plant growth. Various lamp types were illustrated and the color and intensity of the light produced. A series of slides illustrated the effect of plastic coverings used to control infra-red light entering greenhouses. The effect of light intensity was illustrated with a slide showing two *Platyceriums*. One is shown growing in 85% shade. The fronds are pointing upwards at a 45° angle. About 15 to 20 feet away is the other plant species growing under 98% shade. The angle is less because the fronds have flattened out to capture more sunlight. A slide illustrated how tree ferns lean away from a wall so as to find more sunlight.

In an experiment two plants of *Maranta* growing under a tree fern having leaves growing to one side (the side away from the tree fern trunk, having more light) were moved to a sunny spot. Gradually, the leaves moved to form a mosaic pattern. After a few days in the open location the leaves, because of the light coming from all directions, readjusted to be evenly distributed all around the plants.

A better understanding of plant responses to light can improve the quality of our specimen fern.



*Dicksonia antarctica* under roof eave illustrates phototropism.

Photo by T. Hoshizaki

### LAMPS AND PLANT RESPONSE

Fluorescent - Cool White (CW)  
and Warm White (WW)

Green foliage expands parallel to the surface of the lamp  
Stems elongate slowly  
Multiple side shoots develop  
Flowering occurs over a long period of time

Fluorescent - Gro Lux Plant Lights

Deep-green foliage which expands, often larger than on plants grown under CW or WW  
Stem elongates very slowly, extra thick stems develop  
Multiple side shoots develop  
Flowering occurs late, flower stalks do not elongate

Fluorescent - Gro Lux-WS (GL-WS),  
Vita-Lite (VITA), Agro-lite (AGRO)  
and Wide Spectrum lamps

Light-green foliage which tends to ascend toward the lamp  
Stems elongate rapidly, distances between the leaves increase  
Suppresses development of multiple side shoots  
Flowering occurs soon, flower stalks elongated, plants mature and age rapidly

High Intensity Discharge -  
Deluxe Mercury (HG) or  
Metal halide (MH).

Similar to CW & WW fluorescent lamps compared on equal energy  
Green foliage which expands  
Stems elongate slowly  
Multiple side shoots develop  
Flowering occurs over a long period of time

Incandescent (INC) and  
Incandescent-Mercury (INC-HG)

Paling of foliage, thinner and longer than on plants grown under other light sources  
Stem elongation is excessive, eventually becomes spindly and easily breaks  
Side shoot development is suppressed, plants expand only in height  
Flowering occurs rapidly, the plants mature and senescence takes place

Exceptions: Rosette and thick-leaved plants such as *Sansevieria* may maintain themselves for many months. The new leaves which eventually develop will elongate and will not have the typical characteristics of the species



High Intensity Discharge -  
Low Pressure Sodium (LPS)

Extra deep-green foliage, bigger and thicker than on plants grown under other light sources  
Stem elongation is slowed, very thick stems develop  
Multiple side shoots develop even on secondary shoots.  
Flowering occurs late, flower stalks do not elongate.

Exceptions: Saintpaulias, lettuce and Impatiens must have supplemental sunlight or incandescent to insure development of chlorophyll and reduction of stem elongation.

High Intensity Discharge -  
High Pressure Sodium (HPS)

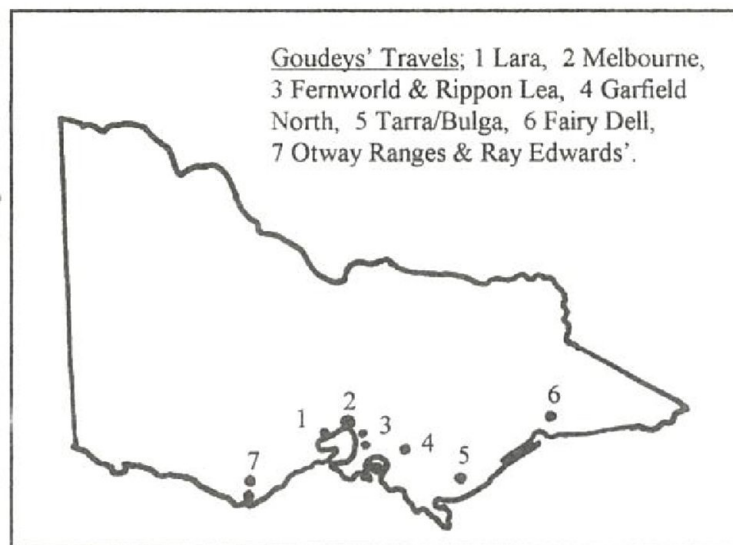
Similar to Gro Lux and other color improved fluorescent compared on equal energy.  
Deep-green foliage which expands, often larger than on plants grown under HG and MH  
Stems elongate very slowly, extra thick stems develop  
Multiple side shoots develop.  
Flowering occurs late, flower stalks do not elongate

(Continued from page 18)

## PRESIDENT'S MESSAGE

We stopped overnight at Bairnsdale and the next morning we headed off to Fairy Dell at Bruthen, as Martin was keen to see *Cyathea lechhardtiana*. The whole area was extremely dry and drought-stricken, but the small pocket which contained these treasures was quite moist.

We returned home to Lara and the next day we headed for the Otways via the Great Ocean Road. We had a very enjoyable walk through Mait's Rest and then on to Ray Edwards' Fern Nursery. After leaving his nursery, we dropped Martin off at Les and Rosemary Vulkz's Nursery where he was to spend the next few days, before leaving for New Zealand.



Don't forget the Garfield North/Glen Noyook excursion on Sunday, 29th March. Bring a B.Y.O. lunch and meet at Dorothy and Ian Forte's farm before lunch.

Keith Hutchinson and his group are leaving for New Zealand on the 20th March, 1998. Too late for more bookings, but we wish them well and I am sure we will all hear about it on their return.

The Fern Show is getting closer. I hope you are all grooming your ferns for the display and competition.

Chris Goudey.





## FROM HERE AND THERE ...

I was surprised to notice that a newly lined basket had very rapidly be denuded of fibre. At the same time a native orchid and the sphagnum backing it onto its mount had disappeared.

Later an abandoned blackbird's nest was found on a high bench in a shade house and after its contents were examined, the mystery was solved!

The orchid was able to be returned to its mount but the basket could not be refurbished.

Fran Harrison  
Essendon, Vic.



### PASSED ON FROM FERNET

Via "Fern World", August 1997.

(The first subject discussed here follows on from P 25 of this issue.)

It was sad to see our stands of *Cordyline australis* dying throughout the country. We lost several that were planted in our garden.....re tree ferns, I've been out and about in the bush a lot lately in the Waikato & Coromandal.....area and haven't noticed any unusual deaths. The ones growing in my garden seem O.K. None of our Fern Club members have mentioned it either.

Sue Smith, Morrinsville, N.Z.

I have many *Cyathea* species in my collection. Over the past three years I have lost my *C. dealbata* and *C. cunninghamii*.....I am reasonably confident it was from root intrusion from adjoining Carob trees.

Keith Rogers, Mannum, South Australia.

Can anyone help me with information on whether trunk elongation in tree ferns can be accelerated by application of plant growth hormones? If so, which hormone, what concentration and how to apply it? I heard a rumour.....that a commercial grower in the Los Angeles area was getting accelerated growth of *Cyathea cooperi* trunks with hormone treatment.....I am growing several species of Australian and New Zealand tree fern outdoors in Glasgow, Scotland and have been experimenting for the last several years principally with how much winter protection is needed. During the summer months I would be interested in promoting trunk growth with hormones and would also welcome info on optimum fertilizer regimes for tree ferns, if such exists.

Professor Alastair C. Wardlaw, Glasgow, Scotland.

Gibberellins, typically GA3, cause internodal elongation in many angiosperms.....Let us know your results

Clinton Morse, Storrs, Connecticut U.S.A.

I would be wary of treating valued plants with gibberellins because internodal elongation is not the only effect it can have. In angiosperms abnormally small leaves

and general chlorosis often accompany stem elongation. I tried using it in micropropagation of roses but found a few weeks in a dimly lit coldstore was preferable.....

Peter Richardson, England

I recommend a spray of 10-4 Molar GA3 with a few drops of detergent.....This concentration is what I routinely use to make dwarf peas grow the same as tall genotypes.....The response to the hormone will only be in the tender growing regions of the stem.....near the crown of fronds. I hope you have ferns to waste because GA generally causes growth to be VERY tall and so spindly that the stem cannot support itself.

Ross Koning, Willimantic, CT 06226 U.S.A.

I suspect that you would do better in the practice of good culture rather than from hormonal treatment.....obvious...perhaps, but I have both observed in the wild and in my own garden that you can accelerate tree fern growth by watering more in the warmer growth periods and feeding well in Spring and Autumn...manures and "Dynamic Lifter"..... Light is the other important consideration.....Like all good things, they take their time and are worth waiting for.

Christopher A. Nicholls, Canberra City, ACT, Aust.



### SPORES FROM TREE FERNS

During hot dry periods tree ferns are likely to drop sori and spores rapidly. The spores you were hoping to collect.....will be gone before you know it. If you do collect during or just after a hot dry spell, there may be nothing but chaff left.

Sometimes the spores that are shed at this time are not fully developed. Even though the spores are dropping from the fronds, the spores are too immature to produce new plants. A close examination (with a magnifier) of the dehiscent material will show a lot of chaffy tissue, twisty annular rings and pale green balls. If there is fine, deeply coloured (usually brown) powder as well, there are probably ripe spores.

### DROUGHT CONDITIONS

(Taken from Los Angeles International F.S. Journal of August 1997.)

Bob Manthorne (LAIFS) observes that his *Platyserium bifurcatum* ssp. *venosa* reacts very decisively to drought conditions. The shield fronds, even the dry, brown ones, fall over the growth bud to protect it while the humidity remains low. When it returns to a normal level, they resume their upright position. Has anyone in Australia observed this interesting phenomenon in their *bifurcatum*?

Barry Stagoll passed on the information "From the Internet" on page 25 of this issue. Unfortunately my computer ate the original before I could acknowledge his help. Sorry, Barry. And thank you!



## RHIZOMES, THE UNDERCOVER STORY.

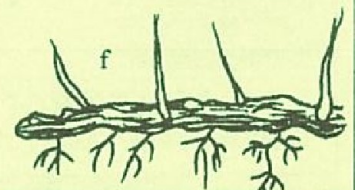
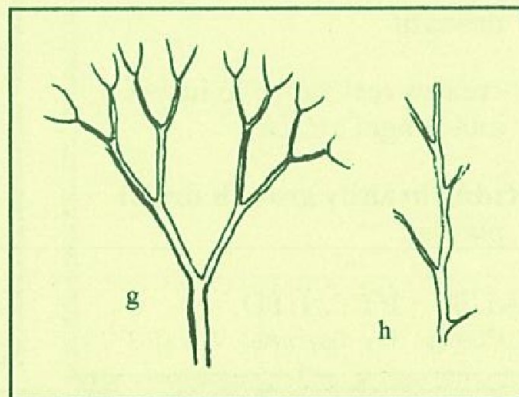
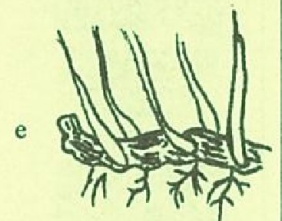
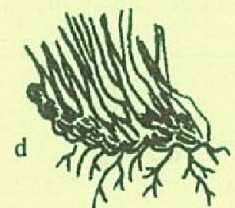
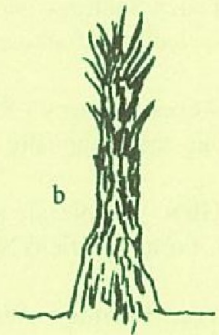
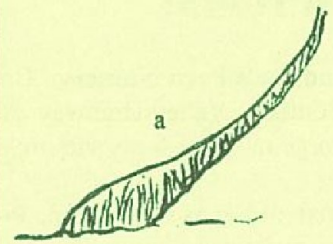
Apex	(Adj. apical) Growing tip, end.
Auricle	An ear-like structure arising from the rhizome beside the base of the stipe, from which plants can be propagated. eg., <i>Angiopteris</i> .
Caudex	Compact, tufted rhizome as in Tree Ferns and other erect ferns.
Circinate buds	Knobby or woody protuberances on the rhizome of some ferns. Their function is not well understood.
Mycorrhiza	(Adj. -izal, -izic) A fungus associated with the root of a plant, to their mutual benefit.
Perennial gametophyte	An unusual gametophyte which persists and produces new sporophytes ('plants') annually. It is a strategy employed by the Annual Fern ( <i>Anogramma leptophylla</i> ) to cope with its arid environment.
Phyllopodium	(Pl. -podia) An outgrowth from the rhizome of some ferns to which a stipe is jointed.
Rhizoid	A filamentous, root-like structure found on a prothallus and some ferns
Stipule	see Auricle.
Stolon	(Adj. stoloniferous) A slender, lateral stem, arching or running along above the ground, rooting at its tip or joints and capable of forming a new plant.
Trunk	Used to describe an upward-growing rhizome, particularly of tree ferns but also of <i>Todea</i> , <i>Osmunda</i> and <i>Leptopteris</i> genera.
Tuber	Fleshy swelling which develops on stolon from which new plants can develop. eg., <i>Nephrolepis</i> .
Rhizome	A modified stem (usually underground) from which fronds and roots grow.

### Words used when describing rhizomes, and their meanings;

Ascending	growing obliquely at first, then upwards; growing upwards.
Contractile	narrowed and/or shortened.
Creeping roots at the nodes.	running along on or near the surface and producing fronds and nodes.
Decumbent	lying along the ground with the tip ascending.
Dichotomous	forking regularly in pairs.
Erect or tufted	upright
Lateral	to the side
Long-creeping	with a long distance between nodes.
Medium-creeping	with a medium distance between nodes.
Oblique	with unequal sides; slanted.
Radial	spreading as do the spokes of a wheel.
Short-creeping	with a very short distance between nodes.
Suberect	not quite, somewhat, almost or slightly erect.

### Illustrations;

- a Oblique.
- b Caudex or trunk.
- c Tufted, erect.
- d Short-creeping.
- e Medium-creeping.
- f Long-creeping.
- g Dichotomous.
- h lateral branching (g & h seen from above)





# BUYERS' GUIDE TO NURSERIES.

## VICTORIA:

**Andrew's Fern Nursery / Castle Creek Orchids** - Retail. Phone (03)5826 7285.

Goulburn Valley Highway, Arcadia 3813 (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 (03)5282 3084.

Specialising in supplying retail nurseries with a wide range of hardy ferns; no tubes.

**Coach Road Ferns** - Wholesale. Phone (03) 9758 6878. 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 (03)5786 5031. 1052 Whittlesea-Kinglake Road, Kinglake West 3757.

On main road, opposite Kinglake Primary School. Specialising in Stags, Elks and Bird's-nest Ferns.

**Fern Glen** - Wholesale and Retail Phone (03)5629 2375,

D & I, Forte, Garfield North 3814. Visitors welcome.

**Kawarren Fernery** - Wholesale and Retail. Phone (03)5235 8444.

Situated on the Colac-Gellibrand Road, Kawarren (20 km south of Colac),

**The Bush-House Nursery** - Wholesale and Retail. Phone (03)5566 2331.

Cobden Road, Naringal (35 km east of Warnambool), Ferns - trays to advanced. Visitors welcome.

## NEW SOUTH WALES:

**Kanerley Fern Exhibition and Nursery** - Wholesale and Retail. Phone (049) 872 781.

204 Hinton Road, Osterley, via Raymond Terrace, 2324. By appointment.

**Marley's Ferns** - Wholesale. Phone (02) 9457 9188. 5 Seaview Street, Mt. Kuring-Gai, 2081.

All Fern Society members welcome. By appointment.

## QUEENSLAND:

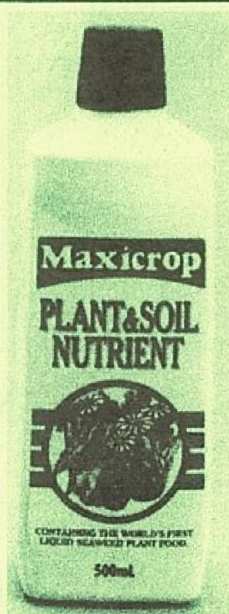
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