THE FERN SOCIETY

OFVICTORIA

Inc.

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NEWSLETTER

VOLUME 13, Number 7, August 1991

FERN SOCIETY OF VICTORIA INC.

POSTAL ADDRESS: P.O. Box 45.

> Heidelberg West. Victoria. Australia. 3081.

OFFICE BEARERS:

PRESIDENT: Robert Lee Ph. 836 1528 Keith Hutchinson IMM. PAST PRESIDENT: 457 2997 VICE PRESIDENTS: Terry Turney 571 8169 Barry White 337 9793 Marilyn Wood -Bernadette Thomson -434 3978 TREASURER: SECRETARY: 399 1587 337 9793 SPORE BANK MANAGER: Barry White John Oliver MEMBERSHIP SECRETARY: 879 1976 EDITOR: **BOOK SALES:** Derek Griffiths 336 3157 8 Susan Court, E. Keilor. Vic. 3033.

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Subscriptions fall due on 1st July each year.

PRESIDENT'S MESSAGE:

Most Members will be aware that the Society assisted in the restoration of the fernery at the National Trust property "Rippon Lea" in 1985 by donating ferns. In the period since then, various talks have held with Trust officers to discuss ways in which our Society could become further involved in the future of the fernery, as it was felt that an on-going relationship could provide benefits to both parties. One area where we thought we could assist was in the proper labelling of the plants to increase public awareness and knowledge of ferns. While our primary role was seen as advisory, we did agree in principle to make some contribution towards the cost.

No action resulted at the time of the talks, mainly because the type of label considered desirable to harmonise with the period of the property was too expensive. Recently, however, we were told that a suitable compromise between aesthetics and cost was now considered feasible. On that basis the Committee has written to the Trust offering to sponsor the cost of labels up to a maximum of \$1,000 and to assist with advice or in any other way we could. We have not yet received an official response to our offer, but there will no doubt be a fair amount of detailed discussion needed before any labels are physically installed. We will keep you informed of progress.

As this will be my last contribution to the Newsletter through this column, I should like to take the opportunity to offer my best wishes to my successor as President for a fruitful and enjoyable period in office.

> Kind regards to all, Bob Lee.

NEXT MEETING

DATE: Thursday, 15th August, 1991.

TIME: Commencing at 7.30 p.m.

VENUE: The National Herbarium, Royal Botanic Gardens,

Birdwood Avenue, South Yarra. (Melway Directory Ref. 2L A1)

BUSINESS: (a) 12TH ANNUAL GENERAL MEETING.

(b) August General Meeting.

GUEST SPEAKER: Chris Goudey, First President and Honorary Life Member

of the Fern Society of Victoria.

TOPIC: Ferns of Zimbabwe and other items of interest from a

recent visit.

MEETING TIMETABLE

7.30 p.m. Pre-Meeting Activities: - Sales of Ferns, Spore, Books

and Special Effort Tickets; Library Loans.

8.00 p.m. ANNUAL GENERAL MEETING.

Agenda: (i) Minutes of 1990 A.G.M.

(ii) President's Report.(iii) Treasurer's Report.

(iv) Election of Committee for 1991/92.

(v) General Business.

8.30 p.m. August General Meeting.

8.45 p.m. Guest Speaker.

9.45 p.m. Fern Identification and Pathology.

9.55 p.m. Special Effort Competition.

10.00 p.m. Supper.

10.15 p.m. Close.

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MEMBERSHIP SUBSCRIPTION RENEWALS

Membership subscriptions became due for renewal on 1st July. If you intend to continue your Membership and have not already paid your subscription, please make sure to do so by the end of August, as payments after this lead to considerable extra administrative work. Delivery of Newsletters will cease for Memberships not renewed at the end of August.

SPEAKER REPORT - GENERAL MEETING - 18TH JULY, 1991

Speaker: Barry White, Vice President and Spore Bank Manager of F.S.V.

Subject: THE GENUS DRYOPTERIS

(Barry has kindly provided the following paper that expands slightly on the material covered in his talk, which was illustrated by excellent slides and transparencies.)

The <u>Dryopteris</u> genus contains about 225 species and it is expected that more will be identified. There is, however, only one native to Australia - <u>Dryopteris sparsa</u> which occurs in north-east Queensland.

ASPIDACEAE FAMILY

Dryopteris ferns belong to
the family Aspidiaceae (from
the Latin "aspidium" = shield).

The family includes <u>Lastreopsis</u>,

<u>Polystichum</u>, <u>Cyrtomium</u>, <u>Arachniodes</u>,

<u>Coveniella</u>, <u>Tectaria</u>, <u>Woodsia</u>,

<u>Ctenitis</u>, <u>Didymochlaena</u> and others.

Until recently, <u>Rumohra</u> was also
included but, although it has a number of characteristics in common with the <u>Aspidiaceae</u>, it has now been arguably transferred to the <u>Davalliaceae</u> family.

In describing the characteristics of a family or a genus it must be borne in mind that there is not usually a single diagnostic feature which will identify a fern as belonging to a particular genus or family. It is necessary to look at a range of characteristics and then decide the best fit. As more information becomes available it is sometimes necessary to alter the classification of a fern.



D. affinis

The ferns of the <u>Aspidiaceae</u> family are typically ground ferns. The rhizome may be creeping or erect, and is clothed with brown to black scales.

The fronds range from pinnate to quadripinnate, and the pinnae at the base of the frond often have their lower halves extended downwards (basiscopically developed).

The veins may be free or anastomosing (forming a network). The sori are located on the veins and mostly are covered by a round or kidney-shaped

indusium. This indusium is the "shield" from whence the family gets its name, but bear in mind that many ferns with such a "shield" are not members of this family, and some members of the family are lacking an indusium. The spores usually have a rough outer coat, the perispore.

DRYOPTERIS GENUS

The word Dryopteris comes from the Greek "drys" = oak and "pteris" = fern; and probably refers to the oak forest habitat of some of the European members of the genus. The Giant Wood-fern, D. goldiana, from North America has a similar basis for its common name. Some of the Dryopteris genus (e.g. D. filix-mas) are known as Male Ferns because the fronds are relatively robust, particularly in contrast with the fragile fronds of the Lady Fern, Athyrium filix-femina. The translation of "filix-mas" is male-fern. Other Male Ferns include D. affinis (Scaly Male-fern) and D. oreades (Mountain Male-fern). Some Dryopteris ferns are known as Shield Ferns or Buckler Ferns (a buckler is a small type of medieval shield which was held at arms length away from the body), e.g. D. atrata is the Shaggy Shield-fern, D. cristata the Crested Shield-fern, D. aemula the Hay-scented Buckler-fern and D. dilata the Broad Buckler-fern. D. erythrosora (erythrosora refers to the red sori of this fern) is known as the Autumn Fern for the autumn tones of its new foliage.

One of the main distinguishing characteristics of the <u>Dryopteris</u> genus is the kidney-shaped indusium, except for a few species which lack an indusium (contrast with <u>Polystichum</u> and <u>Cyrtomium</u> which have a round indusium). The rhizome is usually creeping below but has an upright apex. The stipe has several vascular bundles. The edges of the ultimate divisions of the frond are usually bluntly serrate rather than sharply toothed (contrast with <u>Polystichum</u> and <u>Arachniodes</u>).

The veins are free, simple or pinnate (contrast with the anastomosing veins of <u>Tectaria</u>, <u>Cyrtomium</u> and <u>Coveniella</u>). The groove on the rachis is continuous with that on the pinna (contrast with <u>Polystichum</u>). The stipe, rachis and often the mid-rib of the pinna bear scales, but no hairs (contrast with the hairs in <u>Lastreopsis</u>).

The genus is mainly centred around the eastern Himalayan region but the distribution is world-wide. China has about 102 species, Japan 59, India 57, Taiwan 40, S.E. Asia 32, North America 16, Europe in the wide sense 26, Africa 22, Hawaii 10, and Australia has one solitary species.

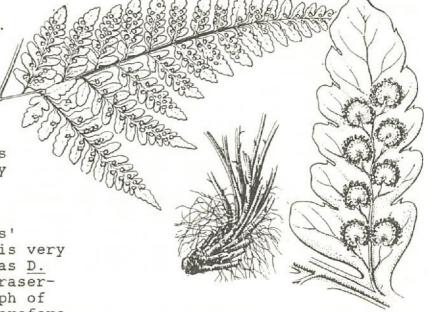
In addition to the 225 species, about 90 sterile hybrids have been identified and it is possible many new species will be identified, particularly in S.E. Asia, where the genus is well represented but not well studied. Many of the species are also hybrids, but as they are fertile and form a distinct well-identified population they are classified as individual species. Two common hybrids which are also species are the Common Male-fern, Dryopteris filix-mas and the Scaly Male-fern, Dryopteris affinis.

A number of <u>Dryopteris</u> are common in cultivation in Victoria, e.g. the two Male-ferns mentioned above, also <u>D. sieboldii</u>, <u>D. hondoensis</u>, <u>D. corleyi</u>, <u>D. carthusiana</u>, <u>D. inaequalis</u>, <u>D. tokyoensis</u>, <u>D. gymnosora</u>, <u>D. wallichiana</u>, <u>D. crassirhizoma</u>, <u>D. erythrosora</u> and <u>D.atrata</u> (probably more correctly known as <u>D. hirtipes</u> subspecies <u>atrata</u>, or it may be incorrectly identified and may actually be <u>D. cycadina</u>). A number of

other species are also in cultivation, and there is probably scope for greater use as there are some quite attractive ferns, e.g. \underline{D} . $\underline{diffracta}$ and D. sikkimensis.

Dryopteris sparsa is the only Dryopteris native to Australia. It occurs in N.E. Queensland and also New Guinea, Philippines, Japan, India and Sri Lanka. It is noted by Jones and Clemesha in their book on Australian ferns as an attractive fern which has been rarely collected. It is readily cultivated and hardy under Victorian conditions.

Arachniodes hasseltii is
described as such in Andrews'
"Ferns of Queensland", but is very
similar to if not the same as D.
hasseltii as described by FraserJenkins in his 1989 monograph of
Dryopteris in India; and therefore
there may well be a second Dryopteris
in Australia.



Dryopteris sparsa

Jones and Clemesha also list <u>Dryopteris poecilophlebia</u> as occurring in N.E. Queensland, but state that it does not properly belong to the <u>Dryopteris</u> genus. Andrews in his book on Queensland ferns now places this fern in the Coveniella genus.

SUB-GENERA

With so many species it is convenient to divide the genus into sub-genera. Fraser-Jenkins, an English authority on the genus, has divided the genus into four sub-genera. These are :-

- 1. Pycnopteris: Type species <u>D. sieboldii</u>. Leathery texture, pinnate fronds with a terminal pinna. Contains four species from S.E. Asia.
- 2. <u>Dryopteris</u>: Type species <u>D. filix-mas</u>. Fronds leathery but not firm, 1- to 4-pinnate, and terminate in a tapering pinnatifid apex; stipe and rachis well supplied with scales. This group contains 144 species and has been further divided into 11 sections.
- 3. Erythrovariae: Type species <u>D. erythrosora</u>. Similar to the <u>Dryopteris</u> subgenus except that the stipe base has a tuft of scales and the rest of the stipe is mostly devoid of scales. The underside of the central rib of the pinna has small scales with a swollen base (bullate scales). Contains 36 species and is further divided into 3 sections.
- 4. Nephrocystis: Type species <u>D.hayatae</u>. Similar to the <u>Dryopteris</u> subgenus except that the fronds are more or less wide at the base, the stipe bears fewer scales, and the upper

stipe and rachis are bare of scales or have a few very small narrow ones. Pinnules are markedly asymmetrical. The Australian species D. sparsa belongs to this subgenus which contains 27 species and has been divided into two sections.

CULTIVARS.

Some of the species have a goodly number of cultivars. The English seem to take a particular interest in these, e.g. Reginald Kaye in his book "Hardy Ferns" names about 20 cultivars of D. filix-mas.

HYBRIDS.

There is considerable variation in appearance in the members of the Dryopteris genus, but there is also a close similarity between many of the ferns. This similarity is partly reflected in the names of two of them - D. affinis ("affinis" means similar to) and D. aemula ("aemula" means imitating), and in the tendency to use the prefix "pseudo" (meaning false) in front of the species name, e.g. pseudomas and pseudovaria.

One of the main reasons for this similarity is the frequency of hybridisation and consequent formation of intermediate species. About half of the <u>Dryopteris</u> species may have originated as hybrids. As stated above, two well-known ferns which are hybrids are <u>D. filix-mas</u> (Male Fern), which is a hybrid between <u>D. oreades</u> and <u>D. affinis</u> (Scaly Male-fern) which is a hybrid between <u>D. oreades</u> and an unknown fern. The fact that they have one common parent explains some of the similarities between the two ferns. Backcrossing and interbreeding between these two and their parents has led to a number of further intermediate types, e.g. <u>D. x mantoniae</u>, <u>D. x euxinesis</u>, <u>D. x tavelii</u>, <u>D. affinis</u> subspecies <u>borreri</u>, and <u>D. affinis</u> subspecies <u>stillupensis</u>. The first two are sterile and the latter three fertile. Further such complexes are not uncommon in the genus.

Hybrid ferns are usually sterile as plants receive one set of chromosomes from each of their parents, and if the parents are of different species then the offspring will have dissimilar sets of chromosomes. These dissimilar sets of chromosomes make it difficult or impossible for the chromosomes to pair up in the critical cell division (meiosis) which occurs in the sporangium during the formation of spores. Thus hybrids usually produce shrunken useless spore. However, D. filix-mas, D. affinis and many other hybrid ferns reproduce from spore quite happily, using the following mechanisms:

(a) Tetraploidy.

The means by which \underline{D} . filix-mas has overcome the problem of incompatible chromosomes is by doubling its number of chromosomes so that it has four sets instead of two. This condition is known as tetraploidy and enables the chromosomes to pair off during meiosis and fertile spores to be produced.

D. x initialis is also a hybrid between D. oreades and D. caucasica, the parents of D. filix-mas, but this fern only has two sets of chromosomes and is infertile. However, at some stage one of these sterile D. x initialis doubled its number of sets of chromosomes to four and so the fertile D. filix-mas was formed. D. filix-mas is a very

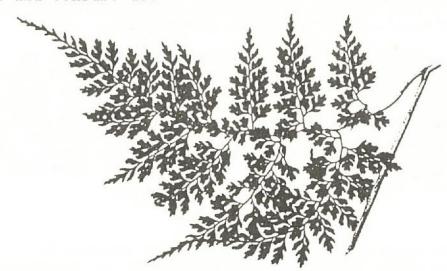
successful fern. It originated in Europe but also occurs in North and South America, Greenland, U.S.S.R., Pakistan and India.

Tetraploidy is a common condition in the Dryopteris genus.

(b) Apomixis

Apomixis is a reproductive method which <u>D. affinis</u> (with a large number of other members of the <u>Dryopteris</u> genus, as well as other genera) uses to maintain fertility. In contrast to the tetraploid method used by <u>D. filix-mas</u>, whereby the chromosome number is permanently doubled, in apomixis the chromosome number is only doubled in the mother cells in the sporangium just prior to meiosis occurring. The sporangium, instead of producing 64 spores with a single set of chromosomes, produces 32 with a double set of chromosomes. These spores develop into prothalli, but the prothalli are not normal.

Normal prothalli produce sperm and eggs, the sperm are released and swim across to fertilise an egg, and the fern proper then develops. In apomixis no fertile eggs are produced, fertilisation cannot occur and is not necessary. Instead, the new fern develops from a bud on the prothallus and therefore contains the normal two sets of chromosomes. The prothallus still produces fertile sperm which are released and, while not required to fertilise its own eggs, may still fertilise other species of Dryopteris. This results in further hybrids which will have more than two sets of chromosomes, e.g. D. affinis subspecies borreri has three sets of chromosomes, one set each from D. oreades, D. caucasica, and the unknown second parent of D.affinis. D. x tavelii may have five sets of chromosomes. Both of these ferns are still apomictically fertile because the ability to reproduce by apomixis can be transmitted to progeny. Thus new fertile hybrids are likely to continue to be formed, and the genus continue to proliferate to interest and confuse us.



Dryopteris diffracta

<u>P.S</u>: A number of ferns of the <u>Dryopteris</u> genus have been used in medicine, e.g. if you suffer from tapeworms, an ether extract of the rhizome of the Male Fern is a time-honoured remedy. However, overdosage may cause gastro-enteritis, nervous symptoms and death!

OTWAYS TRIP - 9TH & 10TH NOVEMBER

Preliminary planning for this weekend has been completed and we now need to know how many people intend to come on the trip, so that firm costs can be calculated and final arrangements made.

The itinerary proposed for the Saturday is first along Turtons Track, followed by lunch at Beauchamp Falls near Beech Forest, then on to Melba Gully, visiting a couple of nurseries on the way, and stay overnight at the Kangaroobie Lodge near Princetown. On Sunday we will visit Beauty Spot near Lavers Hill, Maits Rest and Grey River Reserve.

Travel will be by coach with pickup at the depot in Moreland and in the City. The tariff at Kangaroobie covers accommodation (bunk room) and meals plus a cut lunch for Sunday, so at this stage it is proposed that people bring their own lunch for Saturday. The coach company can provide a barbecue lunch at an extra cost of \$10 per person per day if this is preferred.

Actual cost for the weekend will depend on the number of people going, but the estimated maximum is \$80 per person. If you are considering going, please let Barry White know either at the August Meeting or by phoning (03) 337 9793 before the end of August. A firm indication of intent plus a deposit of \$20 per person will be needed by the end of September.

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THE RARE AND THREATENED FERNS AND FERN ALLIES OF VICTORIA

by Dr Tim Entwisle

(Continuation of Speaker Report from June General Meeting)

EASTERN MOUNTAINS

Apart from five species already considered (Asplenium terrestre, A. trichomanes, Cyathea X marcescens, C. cunninghamii and Lastreopsis hispida), twelve others occur in the alpine or mountainous areas of north-east Victoria, seven of them rare, two vulnerable and three endangered.

In the mountain forests we have:

Lindsaea microphylla (Lacy Wedge-fern) - "rare": Although relatively widely distributed in East Gippsland, it is rare and localised in the Eastern Highlands, Gippsland Plains and Wilsons Promontory. These populations represent the southern limits of its distribution, which also extends up the east coast. The Victorian border cuts arbitrarily through the east-coast distributions of a number of ferns (see later under East Gippsland).

Ophioglossum petiolatum (Stalked Adder's-tongue) - "rare": Occurs in cool forests in mountains east of Melbourne (across to the start of East Gippsland). Although rare in this area, it is also found in N.S.W., Queensland and W.A. and is widespread elsewhere in the World. It is sometimes hard to distinguish from O.lusitanicum, but is a clear

separate species, having distinct veins, egg-shaped fronds and longer fertile spikes.

Tmesipteris ovata (Oval Fork-fern) - "rare": Is an east-coast species which extends into Victoria in East Gippsland with outlying populations in Morwell National Park and near Gembrook.

Botrychium australe (Austral Moonwort or Parsley Fern) and B. lunaria (Moonwort) - both "vulnerable": These strange ferns are scattered through the north-east mountains in light forest or sub-alpine woodland. They are not all that uncommon but are seldom reported. B. australe extends across into East Gippsland.

Thelypteris confluens (a Lady Fern) - "endangered": The occurrence of this fern in a boggy swamp in the Kiewa Valley is an intriguing record for Victoria, as its Australian distribution is otherwise restricted to Queensland. It does, however, also grow in New Zealand and on all other continents. The Kiewa habitat also includes a number of alpine species at low altitude and may be a relict from the last Ice Age.

The alpine or sub-alpine areas of the Eastern Mountains also support a few rare species:

Cystopteris tasmanica (Brittle Bladder-fern) - "rare": This was previously known as <u>C. filix-fragilis</u> or <u>C. fragilis</u>. It occurs in both alpine and sub-alpine areas near seepage or spray. It is rare throughout Australia, where it is also found in N.S.W. and Tasmania. It occurs in New Zealand and South America.

This species is distinct from the northern-hemisphere <u>C. filix-fragilis</u>, which has become naturalised in New Zealand. It now seems that the taxon we have here is quite rare through much of its range. In the past it would have been considered common overall due to the apparent further population in the Northern Hemisphere.

Grammitis poeppigiana (Alpine Finger-fern) - "rare": This Grammitis (previously G. armstrongii) is restricted to alpine areas. It occurs in N.S.W. and Tasmania and a range of other countries, so it is presumably restricted in Victoria because of the small area of snowfields. G. billardieri can occasionally grow at high altitudes, where it is stunted and like G. poeppigiana in many respects.

Huperzia australiana (Fir Clubmoss) and Lycopodium scariosum (Spreading Clubmoss) - both "rare": These two occur in bogs in snowfield areas and differ from the two Grampians clubmosses in being restricted to one part of the State. Both are also found in Tasmania and New Zealand, while the Huperzia also occurs in N.S.W. and Indonesia.

Blechnum vulcanicum (Wedge Water-fern) - "endangered": In Victoria this is only known from Bryces Gorge amongst rocks in a steep gully. It is also found in Tasmania, Norfolk Island (this was queried from the audience), New Zealand and other Pacific islands. Bryces Gorge is a high-altitude site (c. 1300m) and gets snow. Other ferns found there are Cystopteris tasmanica, Asplenium hookerianum and Grammitis poeppigiana. This area appears to be another Ice-Age link with Tasmania, as some flowering plants there are found otherwise only in Tasmania.

(To be continued.)

FORTHCOMING GENERAL MEETINGS

SEPTEMBER MEETING

Date: Thursday, 19th September.

Time: Commencing at 7.30 p.m.

Venue: The National Herbarium, South Yarra.

Guest Speaker: Paul Barnett, Leader of the Otways Group of the Society

for Growing Australian Plants.

<u>Topic</u>: Ferns of the Otways.

OCTOBER MEETING:

Date: Thursday, 17th October.

Time & Venue: As For September.

Guest Speaker: Mr Stephen Stewart of Gale Australia Pty Ltd.

Topic: Shade Cloth and its Application.

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July General Meeting

Barry White

Marilyn Wood

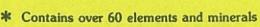
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R. & M. Fletcher's Fern Nursery - Retail.

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(Look for sign on Warburton Highway, 300m east of Seville shopping centre). Closed Tues. except on public holidays.

Mt. Evelyn Fern Centre - Retail.
63 York Road, Mt. Evelyn, 3796. Ph: (03) 736 1729.
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