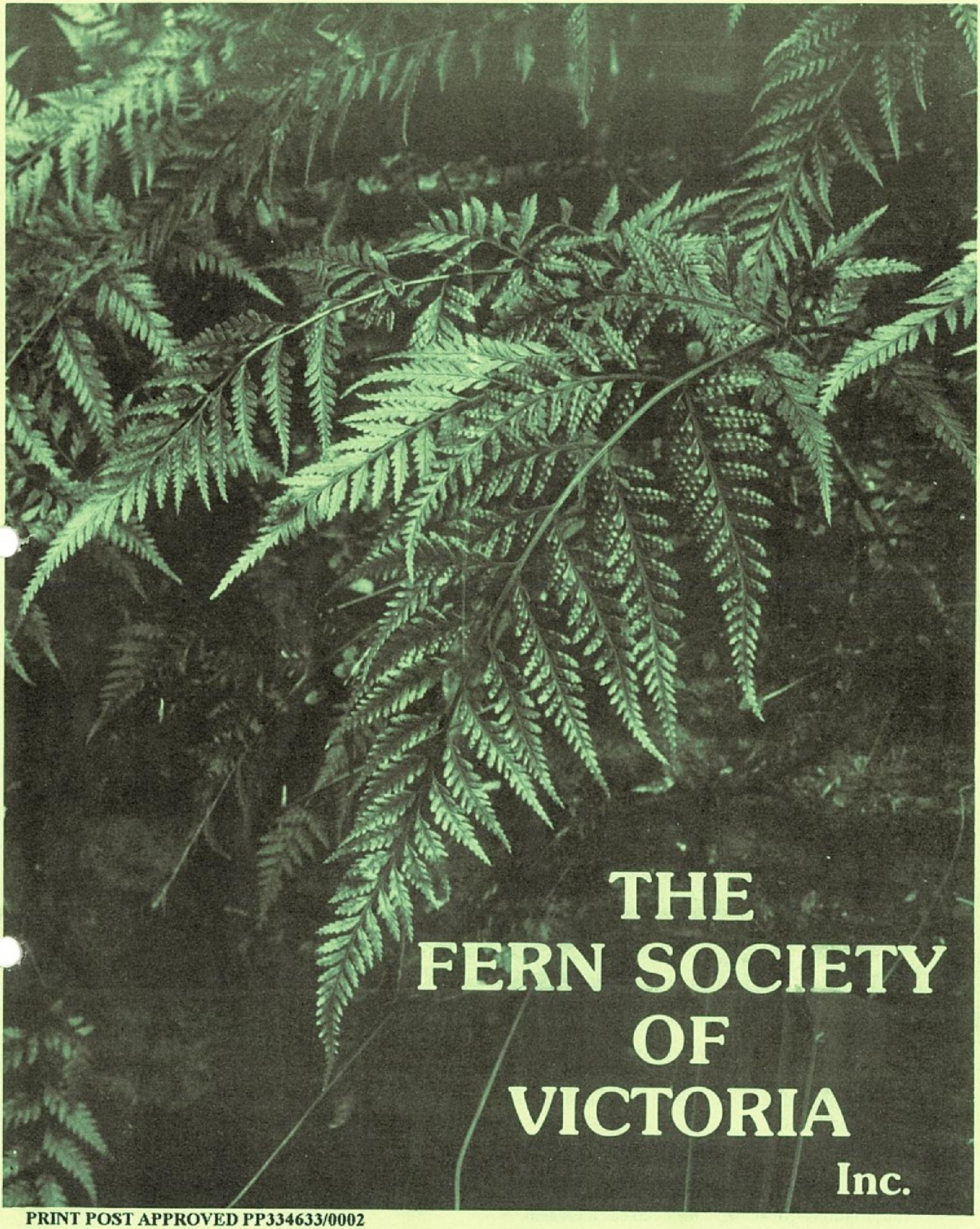

THE FERN SOCIETY OF VICTORIA Inc.

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NEWSLETTER

VOLUME 19, Number 3 May / June, 1997

FERN SOCIETY OF VICTORIA Inc.

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SUBSCRIPTIONS:

Single -	$13.00	Pensioner/student $10.00
Family -	$15.00	Pensioner Family $12.00
Overseas -	A$20.00 (Magazine by airmail)	

Subscriptions fall due on 1st July each year.

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

It is with regret that I announce that Ray Best passed away in February of this year. Ray and his wife Marie from Kenthurst, N.S.W. were long time friends of ours and members of the Fern Society since its early days.
Ray has contributed many articles to our newsletter and he, in our early days, designed our logo. We enjoyed Ray and Marie's company on a couple of occasions in Victoria on an excursion to Wilsons Promontory and once as an interstate guest speaker. Ray will be sadly missed and our condolences go to Marie and family.

At the last Committee meeting we discussed at length our membership fees. It was felt that in view of the fact that we are now only printing six newsletters per year instead of eleven, we should reduce our annual subscriptions, particularly for overseas members.
As from this year, the subscriptions will be as follows;

	1996 / 7	1997 / 8
Single Pensioner	$11.00	$10.00
Family Pensioner	$13.00	$12.00
Single Member	$15.00	$13.00
Family Member	$18.00	$15.00
Overseas Member	$30.00	$20.00

Continued on Page 36 ➪

1997 FORTHCOMING MEETINGS & EVENTS

MAY GENERAL MEETING
Thursday 15th May at 8.00 p.m.

THE FERNS OF FRASER ISLAND

with Barry White and Don Fuller

This follows the talk on Carnarvon Gorge last October (Vol. 18 No. 6), Fraser Island being the second area of abundant and interesting (if not always obvious) ferns visited on their trip.

JUNE GENERAL MEETING
Thursday 19th June at 8.00 p.m.

THE FERNS OF MADAGASCAR

with Joan Rowlands

Joan will tell us about the trip she took to Madagascar, a Republic consisting of one large and several small islands off the east coast of Africa. It has many unique and fascinating ferns.

VENUE: Victoria Bowling Club, 217 Grattan Street, Carlton.

MEETING TIMETABLE:

7.30	Pre-meeting activities - Sale of ferns, spore, books, merchandise and Special Effort tickets. Also library loans.
8.00	General Meeting.
8.30	Topic of the Evening.
9.30	Fern Competition judging, Fern identification and pathology, Special Effort draw.
9.45	Supper.
10.00	Close.

MONTHLY COMPETITIONS:

MAY ..... A Maidenhair Fern *(Adiantum)*

JUNE ..... A Rasp Fern *(Doodia)*

JULY..... A Holly Fern (*Cyrtomium*)

⇦ *PRESIDENT'S MESSAGE Continued from Page 34*

For any members who have paid their 1997 / 8 subscription, we can adjust it next year.

We still have copies on hand of Michael Garrett's book on 'The Ferns of Tasmania'. They can be purchased from Ivan Traverso (Book Sales Officer) for $45.00 plus postage. Ivan's phone number is (03) 9836 4658.

The fern competition category for May is a Maidenhair Fern and for June is a Doodia. The speakers for the May meeting will be Don Fuller and Barry White on 'The Ferns of Fraser Island' and June will be Joan Rowlands on 'The Ferns of Madagascar'.

If anyone has suggestions for Guest Speakers or topics that they would like to hear discussed, please pass it on to one of the committee members.

As you may have noticed from the line-up of office bearers listed in the newsletter, we still do not have a Secretary. It is becoming more difficult for myself and members of the committee to take on extra responsibilities, so it is getting to the stage where we must have a Secretary for the committee to function properly. So please, will all members give it some thought - it takes a team effort to keep this Society going.

Chris Goudey.

At a recent meeting Keith Hutchinson said that he had sown some spore of Adiantum fragrans in Debco Bonsai Mix in March 1996. Prothallia grew but there was no more development by mid-November. He had mentioned this to Chris who advised that often nothing happens right through winter, and not to throw it out yet!

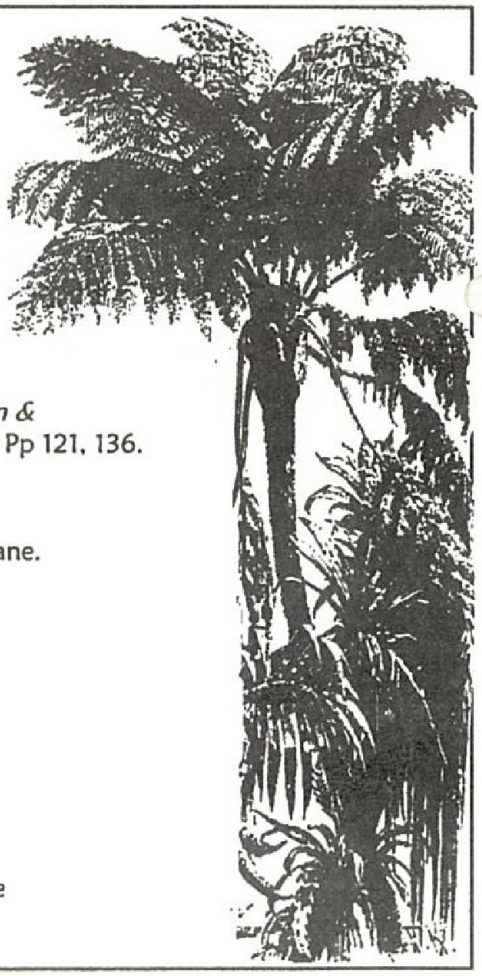
He was soon proved to be right - within a short time ferns were popping up thick and fast. Keith had already pricked out eighty plants and there looked to be at least that many still coming on, probably more.

A couple of lessons in spore raising are to be learned here:

a) If nothing happens for six months, especially over winter, don't give up

b) Debco Bonsai Mix would be worth trying as a spore-raising medium.

FERN COMPETITION RESULTS



MARCH GENERAL MEETING

COMPETITION CATEGORY: FERN PHOTOGRAPHY

1. Don Fuller — *Cyathea cunninghamii*
2. Chris Goudey — *Polystichum cystostegia, Platycerium bifurcatum & Pneumanopteris penniger,* as in his "Ferns in Cultivation" Pp 121, 136.
3. Lyn Gresham — *Asplenium lividum*

EXHIBITORS' DRAW: Kathy Goodall

SPECIAL EFFORT: Ivan Traverso, Bob Lee, Simon Hardin &Dick Kissane.

APRIL GENERAL MEETING

COMPETITION CATEGORY: A PLATYCERIUM.

1. Don Fuller — *Platycerium hillii*
2. Lyn Gresham — *Platycerium veitchii*
3. Dorothy Forte — *Platycerium* German hybrid.

EXHIBITORS' DRAW: Lyn Gresham

SPECIAL EFFORT: Jack Barrett, Joy Horman twice!! & Dorothy Forte

SPEAKER REPORT - MARCH 1997 MEETING

PHOTOGRAPHY, MAINLY FERNS.

Keith Hutchison

Keith has been a keen photographer for over thirty years and was a member of the very successful Rosanna Camera Club for over ten years. His main interest is slide photography with many being used in out Society meetings.

THE BASICS

Keith began his talk by explaining in simple terms just how a photograph is made. When we point a camera, with film loaded, at a subject and press the button, the image is reflected off the subject, through the lens and onto the film. This film has a chemical on it. Where the image falls onto it the chemical burns, leaving a burnt impression on the film. Before we can see it, the film must be processed either into negatives, slides or photos.

LIGHT, SHUTTER SPEED AND APERTURE.

A certain amount of light is required to make a good photo. If the shutter is set to open and shut very quickly (fast shutter speed), the hole (aperture) through which the light comes in needs to be bigger to let enough light in in that short time. Speed is expressed as parts of a second (time) and aperture is expressed as F Stop (size).

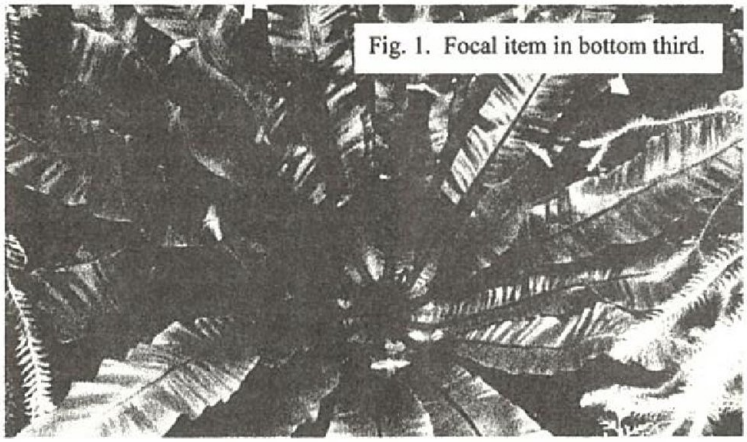


Fig. 1. Focal item in bottom third.

CAMERAS

Keith showed and talked about the cameras he owns, in order of purchase. The first one was a 'Fujica' compact; very simple and reliable. He used it with the speed set on 60 and the aperture on 8, the setting which suited the film commonly used at that time.

To photograph something with a bit of movement it was set on a fast speed and the aperture would automatically adjust to suit. Or, to get more depth of field the speed might be slowed down to 30th of a second and the aperture would then adjust to F11, much smaller. The larger the F Stop number the smaller the opening. For a simple camera in 1960 that was pretty good.

The next camera was a 'Canon' SLR (single lens reflex), a heavy but reliable, tough camera. Because the viewfinder 'looks' through the same lens as the camera, what you see is what you get with any SLR. Keith has had three extra lenses for this camera; telescopic, macro and wide angle. He kept the wide angle lens as it is easy to use and handy for such things as fitting a large group of people into a photo. The Canon can be operated manually or automatically and takes filters and lenses as desired.

No. 3 was a little Nikon Compact, bought in about 1980. A very simple and reliable camera, not terribly expensive, it is handy for travelling or whenever he doesn't want to carry a heavy camera. Though not as versatile as the whiz-bang, top-of-the-range ones, it almost always produced a good photo.

Nikon and Canon cameras have very good lenses, and this is no exception.

The last camera Keith has bought cost approximately three times as much as the Nikon Compact. It is a Nikon Zoom 105. It can be operated as an automatic or a manual and has a built in telephoto lens, making it good for distance photos. It is not so simple to operate but is extremely versatile.

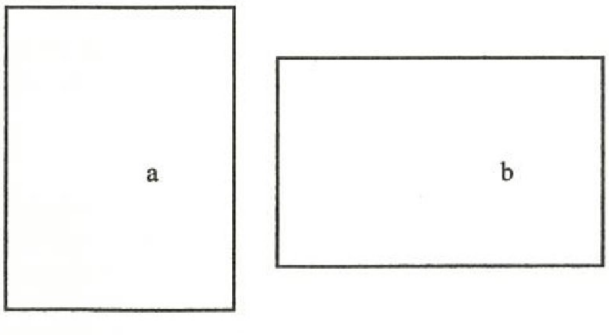


Fig.2. a. vertical format b. horizontal format

SPECIAL LENSES AND FILTERS.

There are four filters which can be used when photographing ferns.

1) Spot-soft filter is used when a sharp subject is required. It fades out the background while you (hopefully) keep the subject in sharp focus.

2) Close-up lenses from ¼ to 1 metre are very good. The numbers denote the proximity of the camera to the subject.

3) Polarizers, which acts the same as polaroid sunglasses, eliminate reflection from shiny surfaces such as water, glass or shiny leaves. They also darken skies. A polarising filter can be used for light coloured ferns on a dark background. Suitable for both colour and black-and-white film.

4) Colour Spot is used only with colour film. The central subject retains its natural colour while the surroundings take on a tint. Available in various colours, they can be used to create a contrast between the target fern and the surrounding greenery. Experimentation will be needed before proficiency is achieved with these.

FILM

Keith keeps exposed and unused films in pockets at opposite.
ends of his gadget bag and marks one pocket zip so that he knows the difference at a glance.
The main films used today would be Kodak 100 and Fuji. When photographing ferns, Fuji is not so good for prints but gives a truer green for slides. Kodak gives good greens for printed photos but has been found to be a bit yellow in slides, Ektachrome being perhaps better than Kodachrome. The new Kodak 400 would be great for photographing ferns because it is suitable for use in low light levels. It is quite a bit dearer; about $6 compared to roughly $4 for the Kodak 100 of 24 exposures.

LIGHT METRE

A light metre is held up to the light, close to the subject, and in a few seconds the reading is displayed. From this you can decide whether to take a photo or not and what film to use if you do. The main use nowadays, however, is by umpires at the cricket because automatic cameras have a built-in light meter. The reading is displayed in the camera's view finder.

TRIPOD

A tripod, bipod or even a single stick which is now available (to be driven into the ground) will steady the camera so a clear picture can be taken in many situations.
For photographing ferns in dark places a slow shutter speed is necessary. It is difficult to keep the camera steady enough to capture a clear image without a tripod.
When using a telephoto lens any movement of the camera will result in a poor photo. A tripod on which to mount the camera is desirable or it may be sufficient to brace one's arms firmly against the body or a stable object to form a human tripod.

THE ART OF PHOTOGRAPHY

(or "Making it Look Good")

Photography is 'art with the camera'. The judge in a photographic competition has approximately ten seconds in which to judge each slide. A glaring eror is going to be noticed - the judge's eye will be drawn to it at once. We may not be as critical as a competition judge, but we will still know what pleases us and what we find unremarkable.
Judges award a maximum of five points for a photo, usually one point each for composition, focus, exposure, lighting and impact. So these are the five things we need to consider when using our cameras.

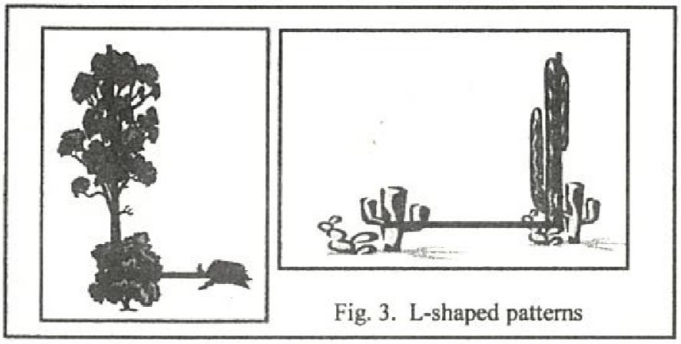


Fig. 3. L-shaped patterns

COMPOSITION

This is probably one of the simplest things, but also one of the most important. There are lots of pleasing layouts, none more 'correct' than others, but there are two classics which always seem to work.
The first decision to make is whether you want a vertical ('portrait' Fig. 2a) or a horizontal ('landscape' Fig. 2b) format
Whichever you choose, an L-shaped pattern (Fig. 3) works well. It doesn't really matter whether each complete plant is included or not. The L need not be formed by plants - for example, it could be three croziers on the one plant. Many of the photos entered in our competition at the meeting had some form of the L-shape in them.

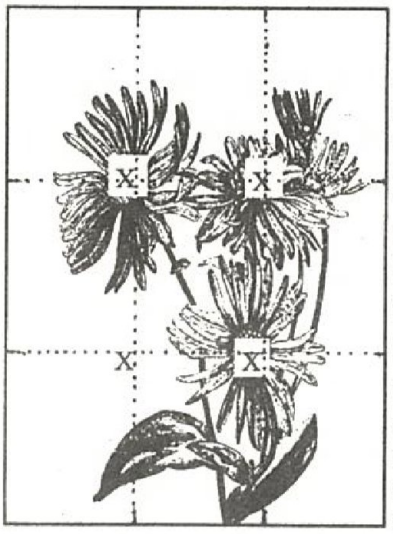


Fig. 4. Thirds.

The second pattern used is the 'thirds system'. The area to be photographed is divided into three horizontally and three vertically by mentally drawing two lines each way. Try to get the focal item on one of the intersections of these lines, and quite often two secondary items 'look right' when placed on two of the other intersections (Fig. 4).
The bullseye pattern (Fig. 5) is important when ferns are being photographed to make a record of the habit of a particular species. The aim is often to clearly show one complete plant, rather than to compose a pleasing work of art.

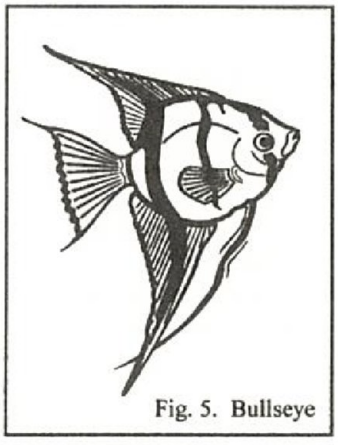


Fig. 5. Bullseye

Another 'rule' to follow is to have an odd number of items in a photo, for no other reason than that it just looks right.
You don't have to always include the whole plant, just the particular feature you are aiming to highlight. It may be the emerging new fronds, interesting rhizome or something else. This focal item often looks well in the bottom (or if it's a tree fern maybe the top) third of the photograph.
When photographing a scene it is desirable to try and have something, a path or stream for example, leading in from the bottom left hand corner to the feature in the centre. Prevent the path running past the feature and out the other side of the picture as it will lead our eye out with it. The left hand side 'looks right' if we read from left to right. Our eye is trained to begin there.
Another good feature to look out for is a path with an S-bend in it, the bend disappearing towards the feature near the centre of the picture (Fig. 6).

FOCUS

When a photo is meant to be pin sharp (perfectly in focus) and isn't, it sure looks like it and the photo is spoiled. Your depth of field can be used to have the feature pin sharp and the background out of focus. To get depth of field you must take the photo at the slowest speed you can. If there is a lot of movement behind your subject, however, a fast speed can be

Fig. 6. Leading the eye into the scene.

used and the background will still be blurred because of the rapid movements.

EXPOSURE

Under or over exposure can be difficult to avoid. Light reflecting off a shiny frond can cause an automatic camera to misread the light conditions, set the aperture accordingly and take a dark photo. A window behind the subject will cause the same reaction.

LIGHTING

This refers to the use of artificial light; flash, backlighting, highlighting, blue flash or tungsten lights. Blue flash, the one normally used, gives a cold picture. When setting up a table top photo tungsten lamps can be used to give warmth to the shot.

A problem with FLUORESCENT tubes is that they go on and off about a thousand times per second. You can take the photo in the 'off' period and end up with a blank photo without knowing it.

HIGHLIGHTING is difficult. It is the use of lights, reflectors and diffusers to throw light on a subject from maybe three or four different spots. This can emphasise certain features, reduce shadows or introduce light to a dark scene. A white umbrella is a useful reflector/ diffuser which may be at hand in any household. Outdoors, a mirror may be put down to reflect the sun into a dark area and thus introduce light where it is needed. The flash in a camera can be used to fill in light from the front. Some cameras have a 'fill in flash' setting for this purpose.

IMPACT

The bottom line with any photography is "does it have impact?" No matter how interesting or beautiful the subject is, if the photograph doesn't have something to catch the eye and the imagination of the viewer, it's not really a good photograph.

MORE TIPS FROM KEITH

1. Be sure you have a film in the camera. Forgetting to load the camera is one of the commonest and most frustrating errors people make.

2. Take the lens cover off. Sounds obvious, but in cameras other than SLR's you can't tell whether it is on or off by looking through the view finder.

3. Before using any complicated camera, apply yourself to a thorough study of the manual in order to get the best results.

5. Keep expensive photographic equipment in a secure place in the home. Cameras etc. are very desirable and attractive items which are high up on every burglar's list; they are portable, valuable and easily sold.

6. Talk to other photography enthusiasts. Gather hints and tips from them - and pass them on.

7. Try all sorts of ideas you have. See how they come out. Be adventurous!

Don't we have a lot of knowledgeable people in our Society? Thank you, Keith, for another great presentation. As an enthusiastic novice, I certainly learned a lot from it.

FERN SHOW 1997 REPORT.

The Fern Show, held at the Herbarium Hall, Royal Botanic Gardens on the weekwnd of March 22nd - 23rd, proved to be a successful event. The weather for the set-up on Friday afternoon and the show days of Saturday and Sunday was fine and mild, ideal for our Show.

Atendance at the show by the public was reasonable, being approximately twice that of last year. The steady stream of visitors on both days kept us moderately busy and there was a number of enquiries regarding membership. Those present also appreciated the great opportunity to socialize with other members.

Although fern sales were less than anticipated the Show will return a modest profit which will assist in balancing the books this year.

The Herbarium hall was partitioned into two sections, the front being used for our display and the rear for fern, book and spore sales.

Our display consisted of the following:

- Two excellent specialist displays by Ian Broughton and Chris / Lorraine Goudey.

Fern Show 1997 cont.

- A central pergola for hanging display and competition ferns.

- A feature display of "Ferns of New Zealand". This contained a good range of ferns found in that country.

- Competition ferns grouped along the centre partition and on and under the pergola.

- Mary and Reg Kenealy again provided a very interesting display of fern memorabilia.

Despite a lot of pre-show comments that because of the extremely hot and dry summer weather members would have few ferns suitable for the competition, there was a good display of competition ferns. Although the number of competition entries was similar to last year, it was pleasing to note that the number of members contributing was higher. If we had a prize for the most dedicated member it would most certainly go to Kathy Goodall of Wodonga who brought down her competition entry over 300 kilometres by train. She surely deserved the competition award she won!!

The staging of the Fern Show requires a lot of effort by many people. We were fortunate to have an excellent team to both set up on Friday and pack up on Sunday which was completed in record time. It didn't pay to stand still as you were likely to be run over or packed up! The Show Committee wish to thank all those who helped to set up and pack up, those who manned the fern sales area, acted as door attendants and stewards, and all who entered the competition and/or contributed to the display.

We also thank Mary Frost who again came down (almost as far as Kathy) to judge the fern competition. We appreciate her interest and effort.

Our thanks also to Multicrop (Aust.) Pty Ltd for their sponsorship of our fern competition and the provision of product samples.

Don Fuller
Chairman of Show Committee

The Show Committee and particularly Don, the Chairman, deserve a huge 'thank you' from the members, too. A show doesn't start happening on the Friday of setting up, the Committee plans and works long before.

Lyn Gresham.

FERN SHOW 1997 COMPETITION RESULTS

SECTION	PERSON	FERN
Adiantum	1. Chris Goudey	*Adiantum raddianum* cv. Brillantelse
	2. Dorothy Forte	*Adiantum diaphanum*
Asplenium	1. Dorothy Forte	*Asplenium* sp. New Caledonia
	2. Don Fuller	*Asplenium polyodon*
Blechnum	1. Chris Goudey	*Blechnum* sp.
	2. Dick Kissane	*Blechnum* sp. New Caledonia
Davallia	1. Don Fuller	*Davallia plumosa*
	2. Don Fuller	*Davallia mariesii*
Fern Ally	1. Dick Kissane	*Selaginella palescens*
	2. Lyn Gresham	*Selaginella martensii*
Platycerium	1. Don Fuller	*Platycerium veitchii*
	2. Kathy Goodall	*Platycerium bifurcatum*
Fern, hanging container	1. Don Fuller	*Drynaria rigidula* cv. Whitei
	2. Don Fuller	*Phlebodium aureum* cv. Mandaianum
Small Tree Fern	1. Lyn Gresham	*Cyathea australis*
	2. Don Fuller	*Cyathea tomentosissima*
Any Other	1. Don Fuller	*Pseudodrynaria coronans*
	2. Dorothy Forte	*Leptolepia novae-zelandiae*
Best Fern of Show	Don Fuller	*Davallia plumosa*
Highly Commended	Dorothy Forte	*Asplenium* sp. New Caledonia

HOT GOSSIP!!

FERN SOCIETY REVERSES GLOBAL TREND!!

Acting on a tip-off, your intrepid Reporter discovered that the Fern Society of Victoria, contrary to current global monetary policies, is **REDUCING** annual membership fees in all membership categories. In a statement to the press, a Reliable Source (The entire Committee at their April meeting) said that because of the reduction in the number of magazines issued annually it was decided to apply cuts to their membership fees (which include magazine subcriptions) of between 7.7% and 33.3%. It was also discovered that the NUMBER OF PAGES WAS INCREASED only two years ago.

"Sounds like fair trading to me," grumbled an onlooker when he heard the news.

"It's just not good enough! We need regulations to prevent this kind of thing happening. What's the Government going to do about it?" raged the Editor of "Wersh Weeds Weekly".

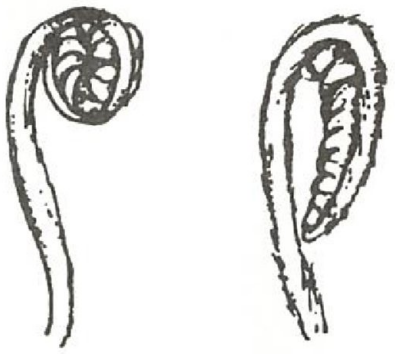
**The new fee scale can be found on page 34 of this issue.

The following article, with diagram, is reprinted with thanks from the South Florida Fern Society Bulletin dated January 1997. SFFS found it in the January 1980 LAIFS (Los Angeles International Fern Society inc) bulletin. Third-hand is just as interesting.

To Coil or Not to Coil, That is the Question.

Dr. Irving W. Knobloch
Michigan State University.

If we look at our beautiful fern plants we notice that from time to time a new leaf will emerge. It doesn't push up from the rhizome in an expanded condition but is seen to be coiled up as a crozier, or fiddlehead. The fern leaf is usually known as a frond and consists of a blade and a stipe. The blade has a rachis and may or may not have pinnae and pinnules. Several things happen from the time of the frond's first emergence toward its maturity. One event is the elongation of the stipe through cell division and cell elongation. Then the crozier starts to unfold but, as anyone can reason, if the blade just unrolled it would be a small leaf indeed. So here again we call upon the processes of cell division and elongation to account for the blade's growth (increase in size). To unroll a tight coil, the divisions and elongation have to be more numerous on the inside or on what will be the upper (adaxial) side of the leaf. Eventually the crozier is completely unrolled but since the frond is still not full size, more divisions and elongations continue.



Emerging fiddleheads - circinate (on the Left) and non-circinate.

An interesting sidelight concerns monomorphic and dimorphic-fronded ferns. In the former type the fronds all look alike, whereas in dimorphic ferns the fertile and the sterile fronds look different. Subtle and as yet little understood processes are at work in dimorphic ferns to produce the unlike fronds.

The condition of a tightly coiled crozier is called circinate vernation.

Those of you who have watched the development of leaves of *Cheilanthes, Ophioglossum, Pteridium* or some species of *Pteris* are well aware of the fact that you can not find a tightly coiled crozier.

What you see emerging is a structure resembling a bean sprout. In other words, the frond is not coiled but the upper part is bent downward like a hook. This condition is known as non-circinate vernation. I (Dr. Knobloch) wrote about it in the July-September 1965 issue of the American Fern Journal. Although non-circinate vernation is not too common, it is worth mentioning.

SPEAKER REPORT - FEBRUARY 1997 MEETING
IDENTIFYING FERNS.

Barry White

Barry stood in for a number of people who were to have taken part that night but for various reasons couldn't make it. He showed many of his excellent slides illustrating aspects of fern identification, and talked about them. He was a more than adequate substitute who taught me, for one, a great deal.

Fern identification is not necessarily easy as there is not just a single point upon which your diagnosis can be 'hung'.The general form of the fern gives a reasonable starting point but some ferns are nonconformist - one fern may have quite a variety of forms. If you are not familiar with the individual ferns it may not be much help when you are presented with a strange one.

The spore pattern is probably the best criterion to use as a starting point. The habit (tree ferns, ground ferns, epiphytes etc.) and other features are also useful indicators to look for.

It is useful to know where a candidate for identification comes from. If it is found growing naturally and the species native to that area are known, the options are immediately reduced.

Blechnums.

In Victoria all Blechnums except *B. cartilagineum* have the distinctly different fertile fronds - often thinner, and with the linear sori continuous, parallel to the midrib and close to it, with an indusium attached on the side closest to the leaf margin and covering the sori.

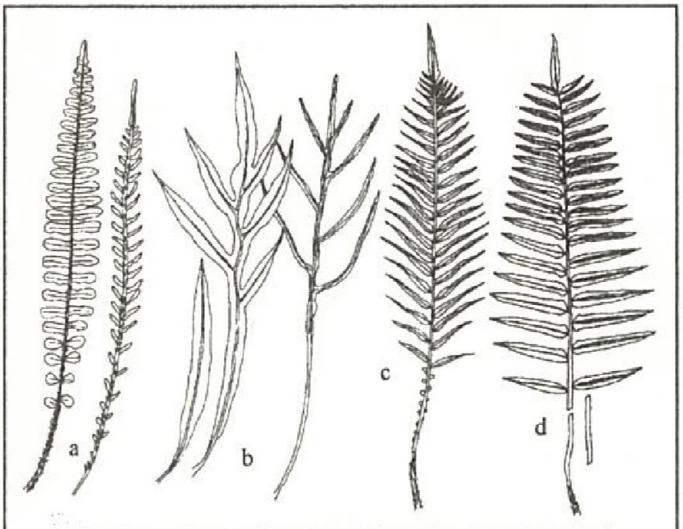


Fig. 1. Some Australian Blechnums;
a) *B. fluviatile*, b) *B. patersonii*, c) *B. orientale*, d) *B. indicum*

Blechnum patersonii and *B. orientale* were seen together as examples of the two types of Blechnum fertile frond, one a lot narrower than the barren fronds on the same plant and the other not significantly different to them.

Blechnum indicum, Swamp Water Fern is found in Queensland, N.T. and N.S.W. down to Royal National Park (just south of Sydney). The fertile fronds of this fern are not distinctly different from the non-fertile ones. This is an example of the importance of knowing a fern's origin. Once we had been told it doesn't grow in Victoria we ruled out *B. cartilagineum*, the other serious possibility we thought of.

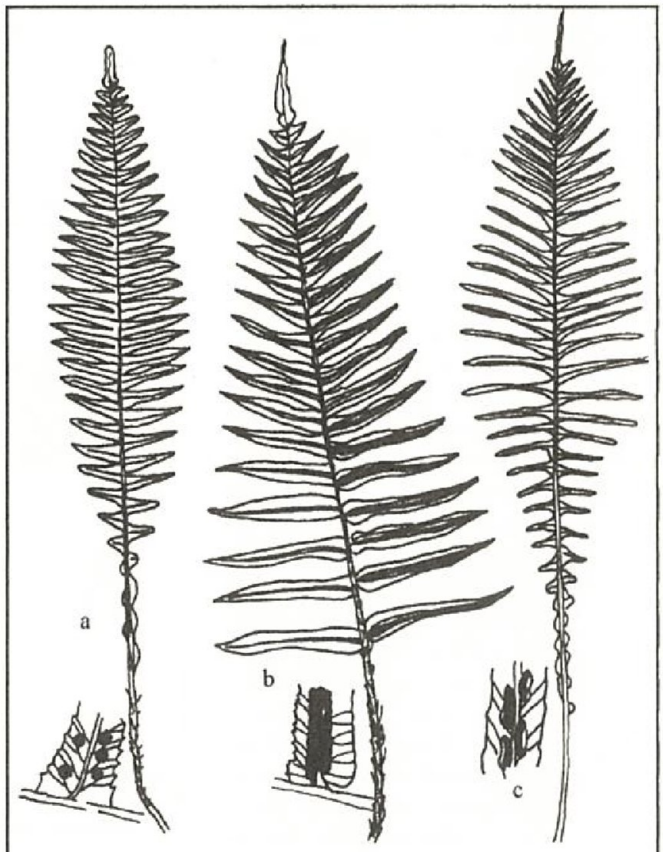


Fig. 2. *Doodia maxima* (c) is a hybrid between *D. aspera* (a) and *Blechnum cartilagineum* (b). The spore pattern is not as interrupted as in *D. aspera*.

Doodias.

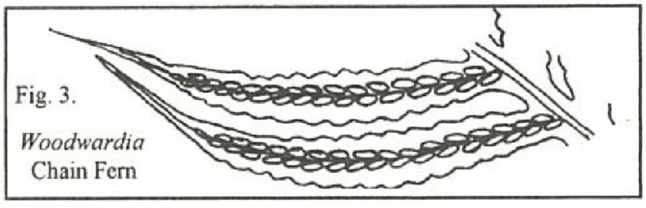


Fig. 3.
Woodwardia
Chain Fern

Doodia aspera (Fig. 2) had us stumped as to its identity, even though we were told it is closely related to the Blechnums. Prior to Barry's talk the panel which had 'volunteered' to try and identify the ferns brought in by members had pondered over a Doodia for awhile and we heard then that they were close relatives.

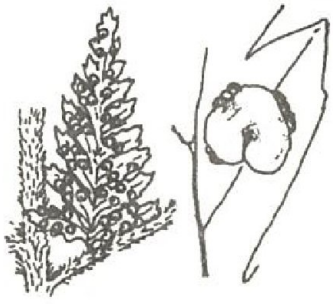


Fig. 4. Shield Fern, *Lastreopsis glabella* pinnule and indusium.

Doodias have some features in common with Blechnums; sori each side of the midvein (sometimes covering it and appearing to be just one line of sori, not two) and the indusia opening inwards. Some are continuous, some are not.

To illustrate that ferns don't always do what they're supposed to, we were shown a *Blechnum punctulatum* from Africa. The form shown had an interrupted sorus instead of the continuous sorus exhibited by other Blechnums.

The Woodwardias.

The Chain Ferns, Woodwardias, (Fig. 3) are so called because the spore patches look like the links of a chain along the frond. They are quite similar to some of the Doodias.
Blechnum, Doodia and *Woodwardia* all belong to the Blechnaceae family.

The Shield Ferns.

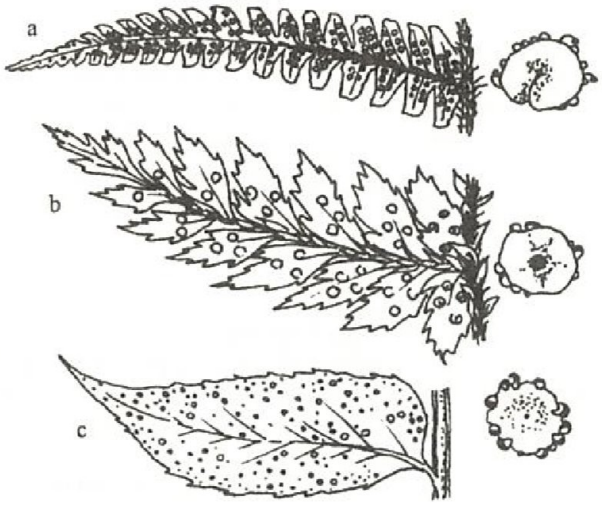


Fig. 5. Pinnules and indusia of *a) Dryopteris , b) Polystichum, c) Cyrtomium*

The Shield Ferns are so called because they have a shield, or indusium, to protect the spore patch.

A typical Shield fern sorus formation (Fig. 4). The spore patch is covered by an indusium and underneath the indusium are the sporangia (spore sacks). Each sporangia usually contains 64 spore.

The Dryopteris indusia may look round but are actually indented on one edge, breaking the circle. Just to keep it interesting, there are a few Dryopteris which don't have an indusium at all.
We saw two members of this genus, *Dryopteris carthusiana* and *D. erythrosora* which is well named; *erythro* meaning red, *sora* referring to the sori. Both showed the typically indented indusia.

The *Lastreopsis* we saw has an indusium indented, but not all *Lastreopsis* have an indusium so you have to look at some of the other characteristics.

Dryopteris may be distinguished from *Lastreopsis* by the scales on the *Dryopteris* compared with the hairs on *Lastreopsis*.
Two other common Shield Ferns are *Polystichum* and *Cyrtomium* (Holly Fern). Both of these have an indusium which is

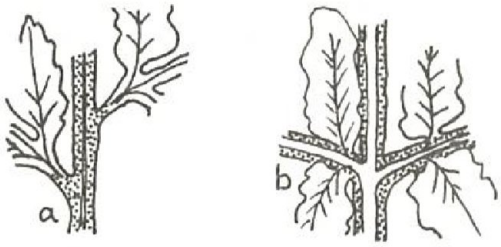


Fig. 6. Grooves of a) *Polystichum* and b) *Dryopteris*

a complete circle compared with the indented indusium in *Dryopteris* and *Lastreopsis*. See Fig. 5.

Examples of *Polystichum* shown included *Polystichun proliferum*, the familiar Mother Shield Fern, *Polystichum formosum* and *P. acrostichioides* (Christmas Fern from North America).
Dryopteris and *Polystichum* are generally similar in appearance though there are small differences. The small pinnules on Polystichums have a longer, sharper tooth on them whereas *Dryopteris* pinnules are rounded.

Something else the botanists go on is grooves (Fig. 6). On this *Polystichum* you can see the groove coming down from the pinnae and then the groove down the midrib. *Dryopteris* also has grooves but there is a distinct difference between the two lots of grooves; Polystichums have a distinct lack of a join between them whereas in *Dryopteris* the two grooves run into each other at the junction. This difference is used as a supplementary characteristic in identification between the Polystichums and the Dryopteris.
The vein pattern may be used to distinguish *Polystichum* from *Cyrtomium.*

The Leather Fern, *Rumohra adiantiformis,* has sometimes

Fig. 7. Rumohra adiantiformis, the Leather Fern, Leathery Shield Fern or Shield Hare's Foot.

been classified with the Shield Ferns but its distinctly different growth habit indicates otherwise and it has been classified separately.

Maidenhairs.

Look at the growth habit - does it have a tight clump or does it have a wandering rhizome like *Adiantum aethiopicum, A. formosum* or *A. diaphanum* (which usually tries to escape out the drainage holes of its pot)?
Look at the shape of the fronds - is it hand-shaped like *A. hispidulum,* pinnate (one long line of pinnae down the stalk) like *A. diaphanum,* or more divided as in some of the others?
Next, look more closely at the shape of the individual pinnae, the type of sorus and the hairs. *Adiantum hispidulum* is hairy - which is what *hispidulum* means. It has hairs on the back of the pinnae (the stalk) and if you look closely you will even see white hairs on the back of the 'indusium'. In fact, Maidenhairs do not have a true indusium. The sporangia are protected by, and attached to, the reflexed (bent under) edge of the pinnae. (Refer Fig. 12)

A. raddianum, the one commonly sold in shops, has no hairs, a rather round false indusium and a well defined indentation in the pinnae edge.

A. capillus-veneris has no hairs, a more rectangularly shaped false indusium and no real indentation.

A. diaphanum, the Filmy Maidenhair, is distinct in appearance because the frond is pinnate and has a soft texture. There are a few hairs, which are black (characteristic of *A. diaphanum*) on the rather rectangular pinnae and the indusium.

A. aethiopicum has quite a different pinnae shape to the previous one, rounded spore patch and is well indented. However it is quite easily recognised by its growth habit.

Quite similar in its spore patch but quite dissimilar in growth habit is *A. concinnum.* It grows more like *A. raddianum,* in a tight clump.

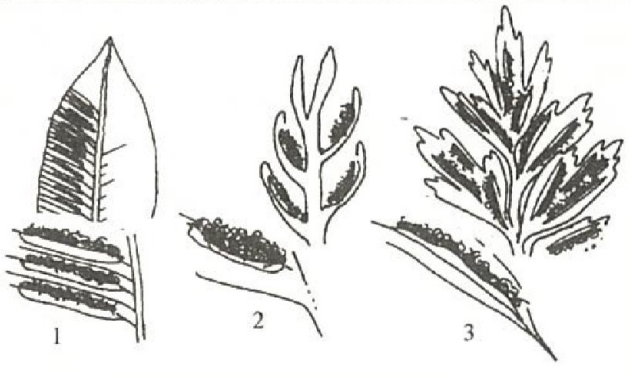


Fig. 8. Some *Asplenium* spore patterns;
1) *A. australasicum,* 2) *A.. bulbiferum* 3) *A.. lividum*

Aspleniums.

Spleenworts are often leathery in texture, one of the exceptions being the first one we saw, *Asplenium lunulatum.* It displays the typical Asplenium spore pattern, linear along the vein and opening towards the midrib and towards the tip of the frond.

A. scolopendrium which used to be called *Phyllitis scolopendrium* seems to be different to the other Aspleniums, in that the sorus is opening in the middle, with the covering on either side.

The Thelypteris Family.

We saw the typical frond shape and the row of round sori running up and down the edges of the pinnules. One example

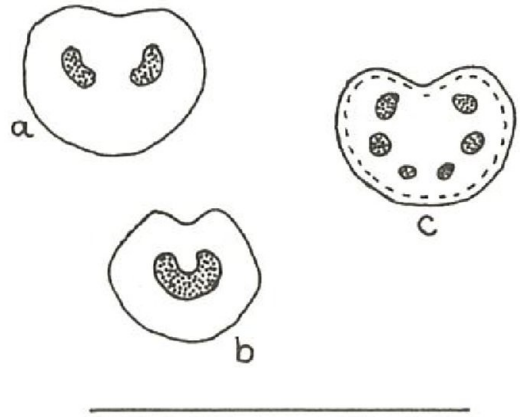


Fig. 6. Fern stem cross sections; a) *Christella dentata,* near stem base. b) *Christella dentata,* upper. c) *Dryopteris*

was *Christella dentata* which has an indusium somewhat similar to the Shield Ferns but the frond formation and growth habit put it into the Thelypteris family.

Another thing the Botanists look at is the vessels (xylem and the phloem) which transmit nutrients up and down the stem. In *Christella dentata* (above) near the base of the stem there are two bunches of conducting tissue, and further up the stem they join together to form a 'U'-shaped structure. This structure is typical of the Thelypteris family. It was contrasted with a slide of *Dryopteris* (Fig.9c) which showed six separate bundles of conducting tissue.

Pteris Family.

The Pteris ferns have spore in a continous row all along the edge of the pinnae and a false indusium. The network of veins on the pinnae of *Pteris comans* (Netted Brake) distinguish it from the other three *Pteris* ferns native to Victoria (*P. tremula, P. umbrosa and P. vittata*) in which the veins do not rejoin to form a network.

Diplaziums, Atyriums and Lunathyriums.

The spore pattern of *Diplazium australe* is not all that different to that of the Aspleniums but again the structure of the conducting tissue is a differentiating characteristic.

Closely related to the Diplaziums is *Atyrium filix-femina* (Lady Fern, from England). Careful examination will reveal small hairs growing out between the sporangia. The presence or absence of these hairs is a feature botanists look for when identifying ferns.

Lunathyrium japonicum is also closely related to, and very similar in style to, the Diplaziums and Athyriums.

Pellaeas and Cheilanthes.

These two genera are closely related and are usually only separated on the degree of division of the fronds, *Cheilanthes* being more finely divided. The sorus is usually in a continuous line along the edge of the pinnae and covered by a reflexed edge of the pinnae from whence comes the common name of *Cheilanthes* - Lip Ferns.

Polypodiums.

Polypodiums have long creeping rhizomes, the sori in a single row on each side of the midrib and no indusium.

Phlebodium aureum (*Phlebodium* referring to the well marked network of veins) has a simple sorus, no distinct pattern to them and not protected by an indusium. The vein patterns can sometimes be very important in identifying ferns and are used by botanists quite a lot.

Microsorum diversifolium, our Kangaroo Fern, again has a simple sorus, unprotected by an indusium. It is recessed into the surface of the pinnae, a feature found in quite a few species in this group, some much more marked than others.

Tree Ferns.

Cyathea cooperi (Fig. 10a) has a double row of indusia which are set in a bit from the edge of the pinnae. The Cyatheas often have an indusium which is very much reduced, so much so that in some it is very hard to spot.

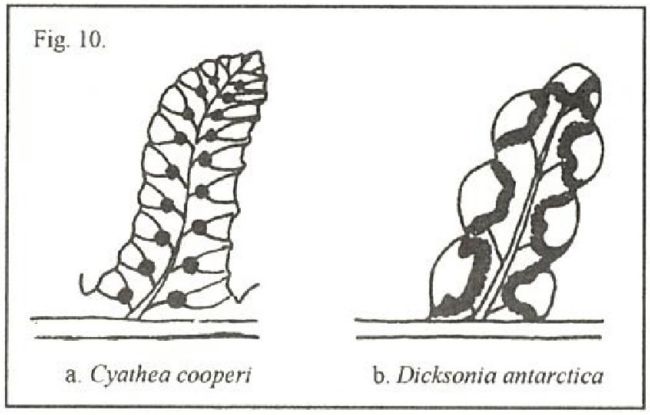


Fig. 10.

a. *Cyathea cooperi* b. *Dicksonia antarctica*

In contrast, *Dicksonia antarctica* (Fig. 10 b) has the sori right on the edge, well covered by an indusium. In fact it is a double indusium, a two valved one; the visible indusium can be lifted up to reveal another one.

The other big difference between the two tree ferns is whether they have hairs or scales. As illustrated (Fig. 11), *Dicksonia antarctica* has hairs, very different from the *Cyathea australia* scales.

Fig. 11 shows what a hair looks like; just a single stack of cells. The divisions between them can be seen, revealing that the structure is a single line of cells.

A scale consists of quite a lot of cells which form a plate-like structure, not a single line. Some scales can look a bit like hairs. Botanists use scales a lot in identification. Size, colour and shape of scale and how the scale is attached are all significant.

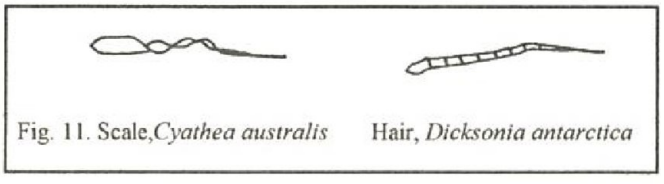


Fig. 11. Scale,*Cyathea australis* Hair, *Dicksonia antarctica*

Filmy Ferns

Polyphlebium venosum, the Veined Bristle Fern is called a Bristle Fern because of the bristle sticking out of the spore body, and veined because of the number of veins visible in the pinna. The name also says that. *Polyphlebium* translates to 'many veins'. Compare that one to our other Bristle Fern, *Macroglena caudata*, which only has a single vein running along the pinnae.

The other Filmy Ferns here have quite a different spore body altogether; a bivalve structure at the end of the pinnae. These are Hymenophyllums. There are very minor differences between the spore bodies of the various Hymenophyllums, but there are teeth on the edge of the pinnae of *H. cupressiforme* and *H. peltatum*. This feature is very different to the other Hymenophyllums. A hand lens reveals a lot with these Filmy Ferns.

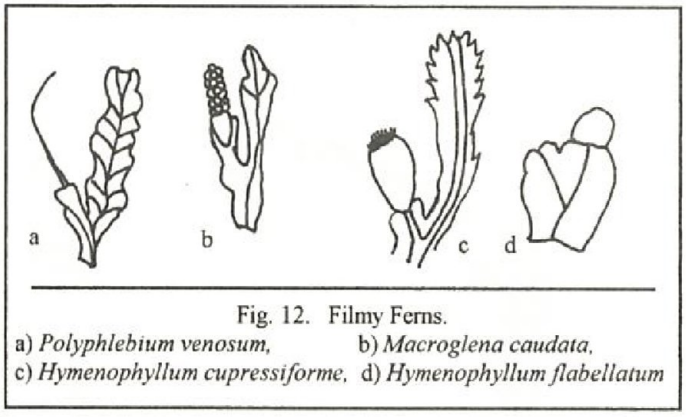


Fig. 12. Filmy Ferns.
a) *Polyphlebium venosum*, b) *Macroglena caudata*,
c) *Hymenophyllum cupressiforme*, d) *Hymenophyllum flabellatum*

Ground Ferns.

One of our common Ground Ferns, *Hypolepis punctata* which is now known as *Hypolepis glandulifera* has a fairly simple spore patch. In this species it is covered by a reflexed bit of the pinnae. A good way of identifying this particular fern is by feeling the stem; it feels sticky. Some of the hairs have glands which produce a sticky substance which sits on the end of the hairs.

Fern Spore.

A 10x hand lens is very useful for examining any fine features when attempting to identify a fern. It is also usually the best way of determining if there is ripe spore present on a frond.

Shining, glistening spore cases are a good indication that ripe spore is present. A feathering or brown, fluffy material visible under an indusium, or on any patch of spore, probably means that the spore has been shed and so it's too late to collect it.

Anyone who has the recent book on Hong Kong Ferns by Dr. So, which includes microphotographs of spore from almost all the ferns she has listed, will have some appreciation of the variety of spore shapes. That type of examination is beyond the large majority of people, but this is an important diagnostic aspect, to botanists.

Barry showed two different spores, an *Adiantum* (Fig. 13a) (the triangular shape is typical of many ferns, but with distinctive variations) and a *Dryopteris* (Fig. 13b) which is more oval in shape and is surrounded by a type of rough protective capsule.

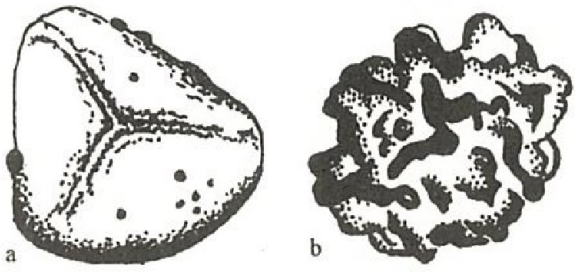


Fig. 13. Sketches of microphotographs of spores of a) an *Adiantum* b) a *Dryopteris*.

Don Fuller thanked Barry on our behalf, for a comprehensive and interesting presentation, and for sharing his wonderful set of slides with us.

Many old beliefs about the power of fern spores to confer invisibility to the carrier probably relate to the Male Fern (*Dryopteris filix-mas*). Its roots were dug up on St. John's Eve, carved into the shape of a hand and baked to make a charm to ward off witches and evil spirits.

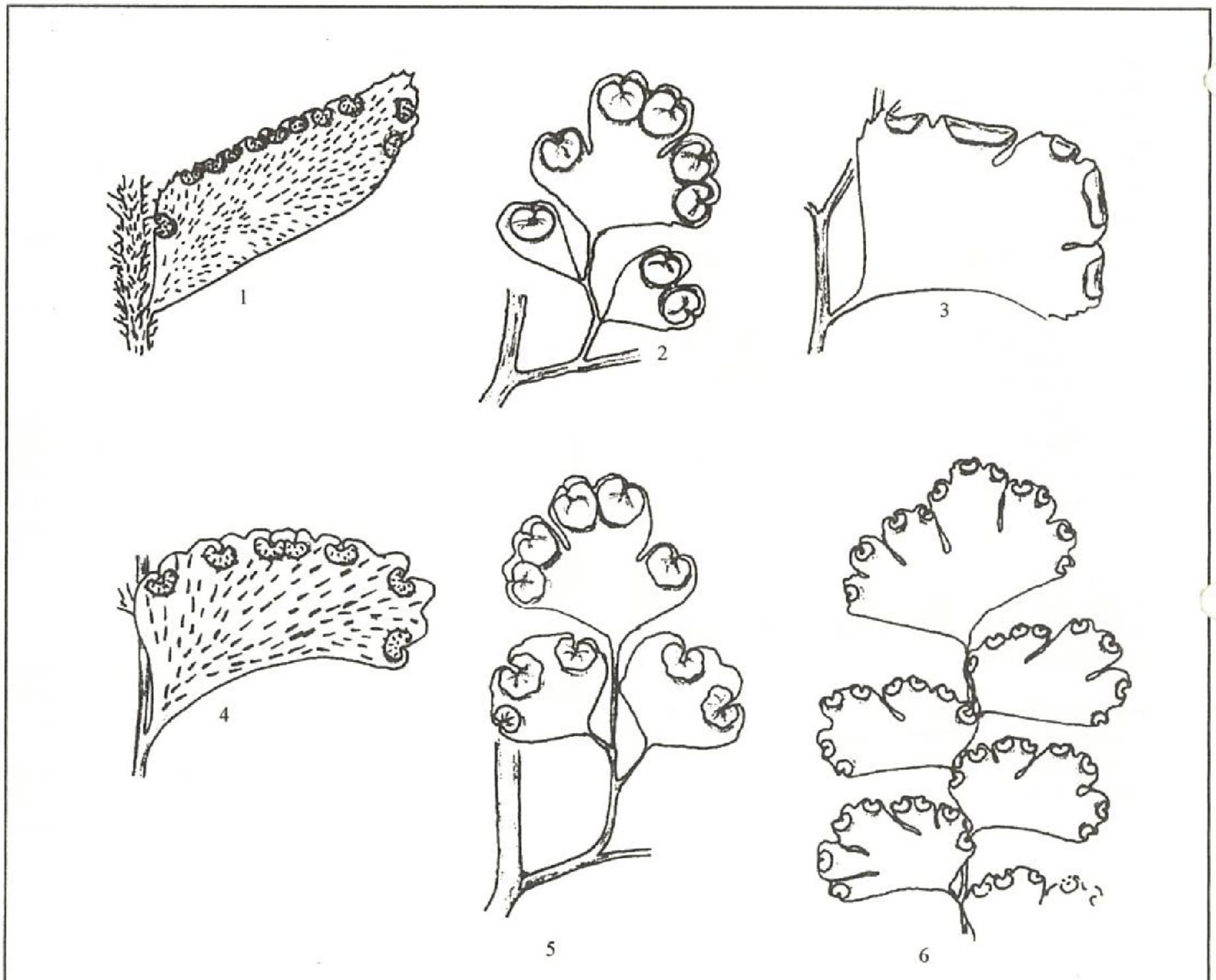


Fig. 14. Fertile Maidenhair pinnules.
1) *Adiantum hispidulum, 2) A.. raddianum,* 3) *A.. capillus-veneris,* 4) *A.diaphanum,* 5) *A. aethiopicum,* 6) *A.. concinnum.*

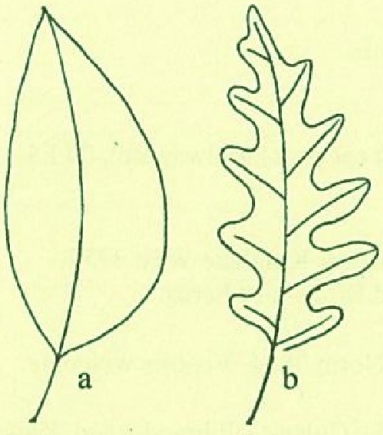
*Opinions expressed in articles in this Newsletter are the personal views of the authors and are not necessarily endorsed by the Society, nor does mention of a product constitute its endorsement.

LEARNING YOUR WAY AROUND FERNS
2. FROND DIVISION.

Lyn Gresham, with advice from Terry Turney.

Some books written about ferns (and other plants) contain a page or two explaining the words we use for various features and properties of plants. This series may help you to better understand what you read or hear about fern frond types. It may also enable you to describe the look of particular ferns briefly and accurately.

Frond Division.

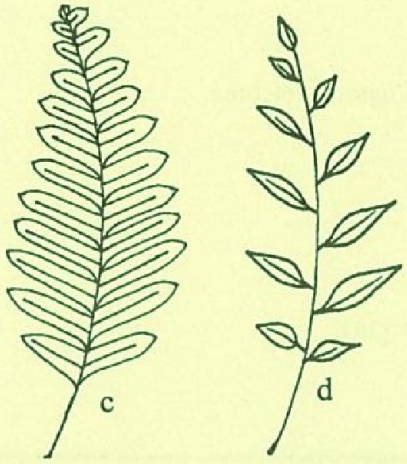


Simple or entire (a) Undivided, of one piece. Not a toothed, lobed or compound frond *(eg. Asplenium australasicum* - Birdsnest Fern*)*.

Pinnatifid (b) Once divided, but not completely i.e. not right to the rhachis *(eg. the final pinnules of Hypolepis muelleri are usually pinnatifid)*.

Pectinate (c) Comblike, with deep, narrow divisions. *(eg. Sticherus tener* - Silky Fan Fern.*)* Perhaps the divisions in the diagram could be narrower.

Pinnate (d) Divided completely to the rachis *(eg. Nephrolepis cordifolia* - Fishbone Fern *is 1-pinnate, Davallia fejeensis cv. "Plumosa" can be up to 5-pinnate).*

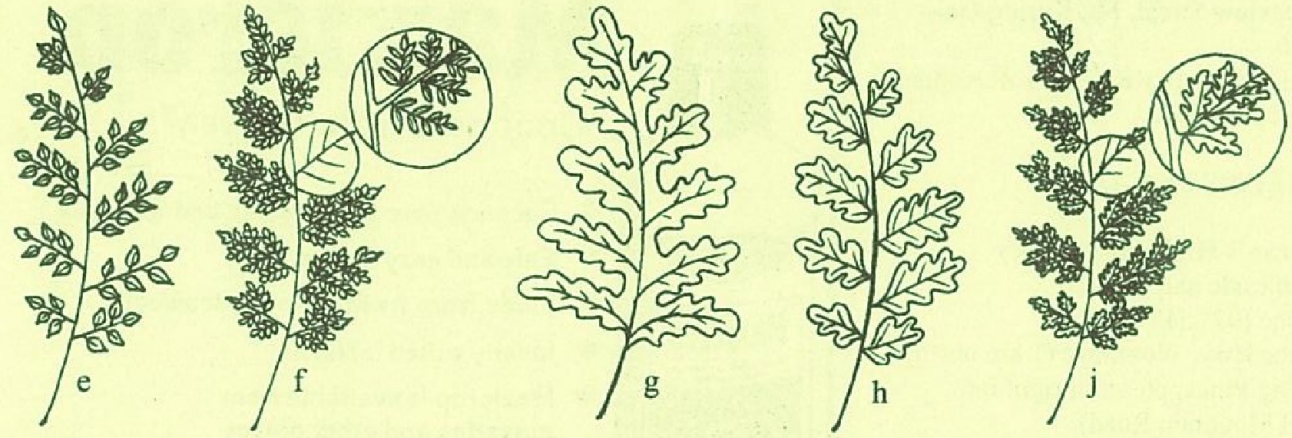


Illustrated below are some examples of further frond divisions.

(e) Bipinnate (also described as pinnae pinnate, twice pinnate, 2-pinnate.
(f) Tripinnate (pinnae bipinnate, three times pinnate, 3-pinnate)
(g) Bipinnatifid (twice pinnatifid, 2-pinnatifid)
(h) pinnate-pinnatifid
(j)Bipinnate-pinnatifid.

Many hybrids and cultivars are many times more divided again. There are also words to describe other shapes, colour, frond margins, unusually formed pinnae (eg. crested ones), surface texture, rhizome growth habit, habitat and more. Stay tuned!

NEXT ISSUE: More unusual frond types, shapes and divisions.



ARTICLES FOR THE NEWSLETTER.

Any original articles of interest will be much appreciated by the Editor and will be published in the Newsletter as soon as possible. There is no restriction on size - a few lines or quite a few pages are equally welcome. Subjects or contents need not be very technical but would be fern related, no matter how vaguely, or at least of interest to fern enthusiasts.

SEND ARTICLES TO Mrs. Lyn Gresham, Fern Newsletter Editor, 20 Murchison Road, Avenel, Vic, Australia 3664

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.
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Fern Acres Nursery - Retail phone (03)5788 5431. 1052 Whittlesea-Kinglake Road, Kinglake West 3757.
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Fern Glen - Wholesale and Retail Phone (03)5629 2375, D & I, Forte, Garfield North 3814. Visitors welcome.

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Jim & Beryl Geekie Fern Nursery - Retail. Phone (02) 9484 2684.
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