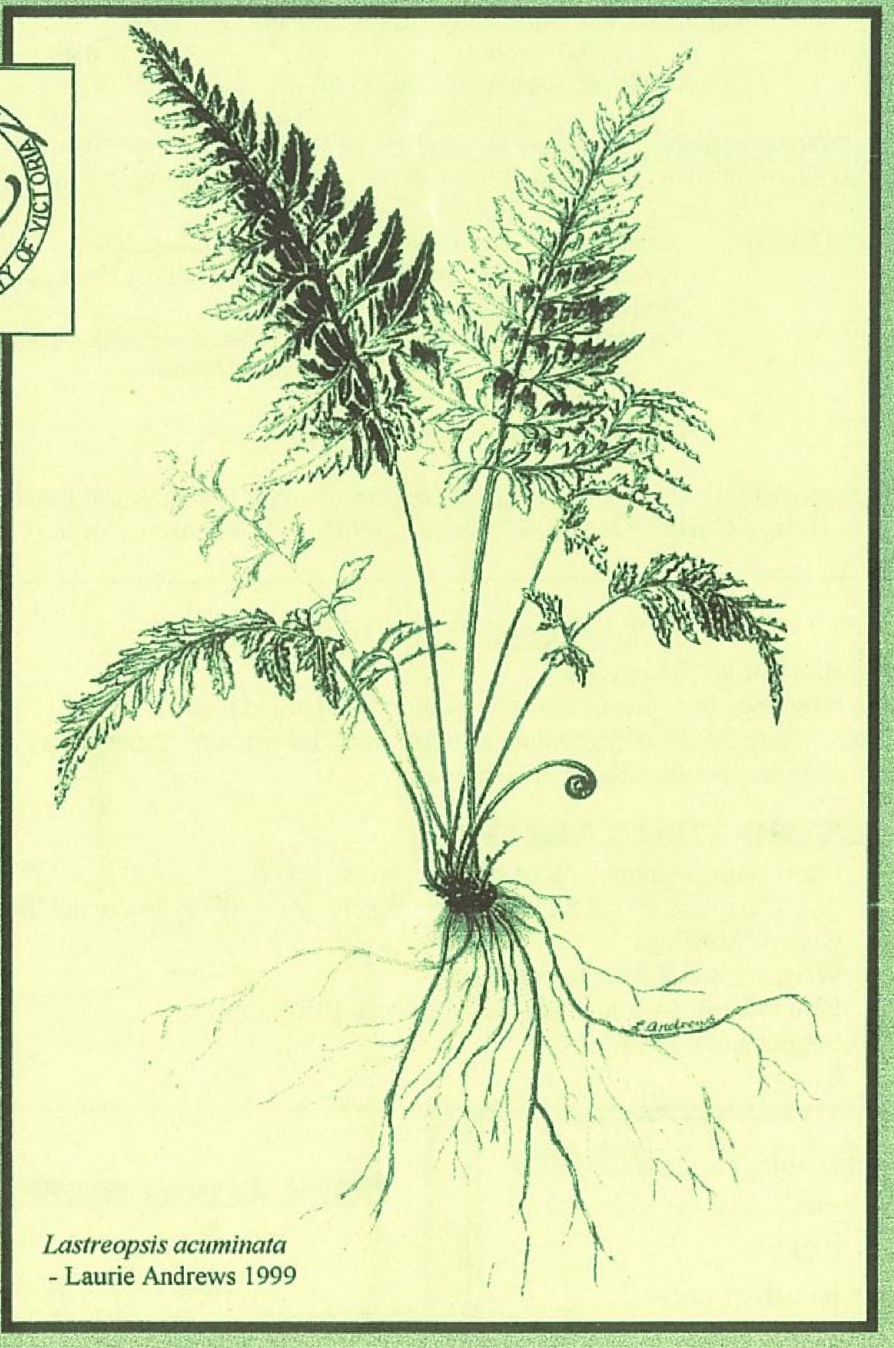
Fern Society of Victoria Inc.
NEWSLETTER



Lastreopsis acuminata
- Laurie Andrews 1999

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Volume 22 Number 2 - March / April 2000

FERN SOCIETY OF VICTORIA Inc.

POSTAL ADDRESS: P.O. Box 45, Heidelberg West, Victoria, 3081

OFFICE BEARERS:

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Vice-President	George Start	"	5962 5059
Secretary	Barry White	"	9337 9793
Treasurer	Don Fuller	"	9306 5570
Membership Secretary	John Oliver	"	9879 1976
Spore Bank Manager	Barry White	"	9337 9793
Librarian	David Radford	"	9598 8398
Editor	Lyn Gresham	"	5796 2466
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Book Sales	Ivan Traverso	"	9836 4658
	(19 Alta Street, Canterbury, Vic., 3126)		

COMMITTEE MEMBERS: Jean Boucher 9707 1592, Lyn Gresham 5796 2466, Jack Barrett 9375 3670, Gay Stagoll 9844 1558, Norma Hodges 9878 9584.

SUBSCRIPTIONS:

Single -	$13.00	Pensioner/student $10.00
Family -	$15.00	Pensioner Family $12.00
Organisation	$15.00	
Overseas -	$20.00 - Payment by international bank cheque in $A please. Overseas sent by Airmail.	

Subscriptions fall due on 1st July each year.

Meetings are held on the third Thursday of each month except December and January
at the Kevin Heinze Garden Centre, 39 Weatherby Road, Doncaster (Melway 47; H1).

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

GENERAL MEETING TIMETABLE:

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

MEETINGS & EVENTS IN 2000

General Meeting on Thursday 16th March

Due to James Brincat's inability to attend the February meeting, our president and Don Fuller filled in very ably at short notice with presentations on Queensland fern finding. They presented March's talk on FNQ, thus the change to:

THE USE OF FERTILISERS - A Product Comparison
and
REMINISCENCES OF EXCURSIONS PAST
Viewing Sites, Ferns and A Few Fernies.
Keith Hutchinson

Five Minute Fern Talk by George Start

Competition; The ferns of North Queensland.

General Meeting on Thursday 20th April

AUSTRALIAN NATIVE ORCHID HYBRIDS
Wayne Turville
of Peninsula Orchids

Wayne is a splendid and informative speaker . . . Invite your orchid-loving friends and garden club members.

Five Minute Fern Talk by Arch Busby

Competition; Adiantums (maidenhairs)

Fern Show 2000
is on this month,
from April 29th to 30th

We'd very much like to share the fun, socialising, promoting (and yes, the work if possible) with you on this great weekend!

Hear David Jones speak at The Society's 21st Anniversary Dinner
Sunday 21st May.
DON'T MISS IT! Secure your place today!

You are asked to bring along your Fern Society memorabilia and a nice fern for our display, if possible.

FERN SHOW 2000

(COMBINED FERN AND VIREYA RHODODENDRON SHOW)

Saturday 29th April - Sunday 30th April

By the time you receive this newsletter there will be approximately 6 weeks to the Show, still time to select and groom ferns for both the competition and the display. Please make every effort to contribute to both and hopefully the weather will have cooled a little.

The seven caregories of the fern competition were listed in the Jan - Feb Newsletter. We would especially encourage all members to have a go at the *"fern arrangement" which is an excellent opportunity to combine one of your best ferns with other plants you may have. If you would like to contribute to the Show, but have a problem getting your plants there, please talk to any Show Committee member and we may be able to help.

Please ensure that all your ferns are correctly labelled with both their botanical and common names. It is also essential to have some means of identifying the owner as this will assist with the safe return of your ferns.

Setting up the show will commence at 11 a.m. on Friday 28th April and we should be able to begin accepting ferns for the competition, display and sales by 1.30 p.m. If you are only able to bring in ferns after 6 p.m. (or early Saturday morning) please contact Don Fuller (9306 5570).

Many people are needed to make the Show work effectively. The many tasks include manning the door, providing light refreshments, acting as stewards in the display area, and assisting in the sales area. Please let us know when you can help.

The admission charge to the Show is $3, and $2 for concession and FSOV members. However those who contribute to the competition/display, or act in an official capacity for a day, will be admitted free.

Those wishing to sell ferns are reminded that they must contribute to the competition/display and that they need to obtain a "book in" form from Bernadette Thomson (9377 1587).

The Show is a very important function of our Society so please give it your full support.

Please publicise it wherever possible and come along and contribute to it. Two show flyers are included with this newsletter; please arrange to display them in public places such as garden centres, libraries, noticeboards. If you belong to a garden club please promote the Show there.

See you at the Show

Don Fuller.

SHOW DETAIL REPRINT

As there is space available, the Editor has reprinted some of last issue's show details.

Competition

1 Adiantum - 2 Asplenium
3 Davallia - 4 Nephrolepis
5 Pteris 6 Fern in Hanging Container -
7 *Fern Arrangement (1 Fern + 2 Other Plants).

1 fern plus 2 other plants which may be flowering or foliage. Pots can be of varying sizes but should be of the same colour. Props/Structures are permitted but not a pot inside another pot.

Fern Display

A final reminder that our feature display is

"Ferns of Australia"

Committee

The Show Committee members are Jack Barrett 9375 3670, Fran and Ray Harrison 9337 7573, John and Norma Hodges 9878 9584, Barry White 9337 9793, Ian Broughton 5964 6402, Don Fuller (Chairperson) and Bernadette Thomson . If you have any queries or suggestions please contact them.

The President and Committee of

the Victorian Fern Society

would like to extend an

invitation to you to join with us

to celebrate

our 21st Anniversary

with a smorgasbord luncheon with

speaker .. David Jones

Australia's Leading Horticulturist

Noted Author

at The Clayton RSL

Carinish Road, Clayton

(opposite the Clayton Station)

Melway Map 79

at 12.30 Sunday May 21st.

Cost $20 per person

RSVP by post to; *17 Grandview Grove*

Rosanna 3084

By: *25 April 2000*

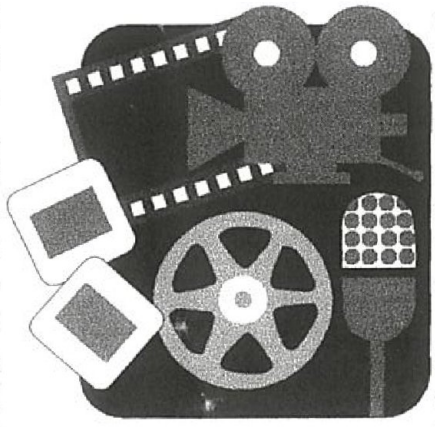
Please enclose cheque payable to the

Fern Society of Victoria.

PRESIDENTIAL PREAMBLE

(Or in this case, "Presidential Page-5-amble")

Ian Broughton



It has been a hectic few weeks. I found out via Don Fuller, on the Monday evening before our February meeting that James Brincat, our guest speaker, was unable to come. With a bit of thinking on the run, Don and I decided to run with the March talk (a slide presentation on our respective trips to the Cairns region) and hope we could find someone who could help out for March. Needless to say, cutting preparation time from one month down to a couple of days in a very busy week, caused some anxiety. But, all said and done, the evening went well - many thanks Don for your input at very short notice.

The other item of interest, that has also required a fair amount of input, is that David Jones has agreed to be guest speaker at our 21st anniversary. A lot of work has been put into organizing the event and we hope as many as possible will be involved to make the afternoon a real success. You will find an invitation enclosed with the newsletter. We realize that for some the cost of $20 may make it difficult to attend. The committee put a lot of thought into setting the price and we felt it necessary for the anniversary to cover most of the costs involved. Just by putting aside $2 each week, the $20 would be covered by May. We hope to have a number of our foundation members present and would like all of our current members - and especially those within driving distance - to be part of the day. If transport is a problem, don't let that stop you from attending, just let Keith Hutchinson know (ph 03 9457 2997) and we will be more than happy to arrange a lift for you.

Don't forget that the Fern Show is drawing closer. We depend on the same faithful members each year to do the bulk of the work and we look forward to their involvement again this year but it would be really great to see some new faces sharing with us this year. It s always a busy time, especially setting up and packing up but we also have a great time of socializing as well. The other way you can help is by putting up posters in appropriate places and encouraging friends or family with an interest in ferns or Vireya Rhododendrons to come to the show. The Society's finances would be buffered by a successful show.

Keith Hutchinson has kindly agreed to step in and fill the vacancy for a speaker at our March meeting. The competition category will be ferns of North Queensland and George Start will give the 5-minute fern talk. In April, Wayne Turville of Peninsula Orchids will be addressing us and we would encourage you to invite any friends who may be interested in orchids. Wayne will also have some plants available for sale.

The competition category will be Adiantums and Arch Busby will be giving the 5-minute fern talk.

I hope you have a cooler and wetter Autumn if you live in Victoria (or drier - if you live in the soggy north of our fantastic country). It would be great if you could make it to the March and April meetings.

Ian Broughton.

Five Minute Fern Talk
September 1999

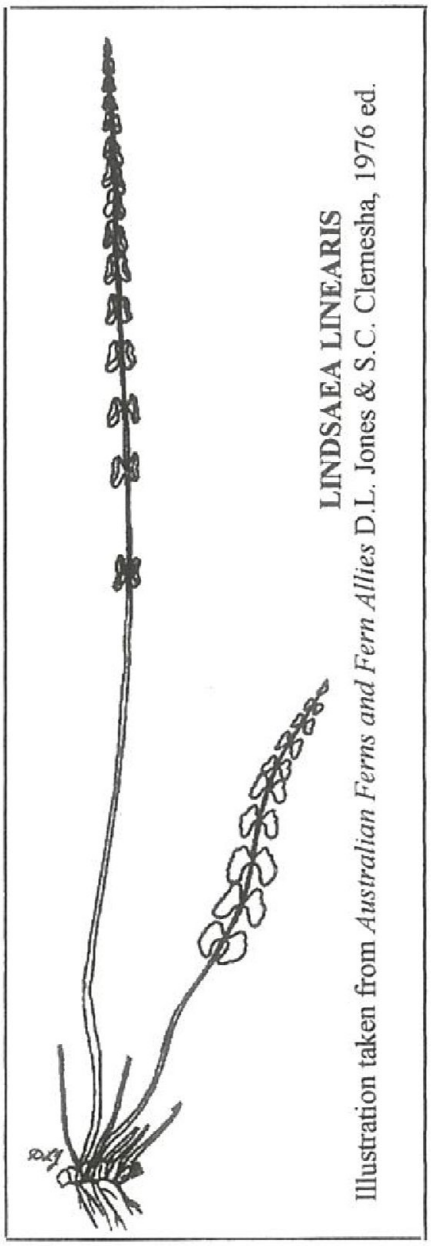
LINDSAEA LINEARIS.

Barry Stagoll

Barry's talk was a vote for the little guys of the fern world.

I have chosen a rather small fern to discuss, because I am a 'detail person'. All plants of any size are interesting but there are some very nice little plants in all sorts of families, in particular in the ferns, which are often ignored.

Lindsaea linearis is a handsome fern with attractive emerald green pinnae. At first glance it looks rather like a very, very small *Adiantum* (Maidenhair). Like *Adiantum*, it has a very dark rachis, almost black. In fact, it can be shiny black, furthering the similarity to Maidenhair. If you see the fertile frond it's fairly easy to identify, if there are no fertile fronds it's a lot more difficult. Once you have established that it is a Lindsaea, at first glance it can be confused with *Lindsaea dimorpha* though after comparing the two plants you would realise that they are not really very similar.



LINDSAEA LINEARIS
Illustration taken from *Australian Ferns and Fern Allies* D.L. Jones & S.C. Clemesha, 1976 ed.

To go to Jones and Clemesha (*Australian Ferns and Fern Allies*); its common name is the Screw Fern. The rhizome is short-creeping and wiry, the fronds erect (though not always that erect, in my experience), dimorphic, linear, pale. The barren fronds are shorter and broader, forming a flattish rosette.

Fertile fronds, on the other hand, are tall, narrow, erect with triangular pinnae, **obliquely deflexed**. If you were up with your Latin derivation of words better than I, that would tell you why the common name is Screw Fern; the fertile frond has its pinnae arranged in a spiral. If you look down on it, it looks like the blades of a woodscrew. As far as I know, this is unique - I don't know of any other fern of any size with any member that looks like the fertile frond of the Screw Fern.

The sori are marginal and elongated, not such an uncommon feature among ferns.

It is not uncommon in various parts of the Victorian bush, in fact it's quite widely distributed (It is also known in all the Australian states, New Zealand and also New Caledonia) but you may not have seen it on your bushwalking rambles - because it's small and fine. You can look and look in a place where it is reputed to grow and not find it. But if you finally see one plant you're likely to discover that it's all around you.

It is extremely choosy about where it grows and how it grows. It is found in moist depressions, swampy heaths or clay flats in open forest country, often forming extensive colonies. It was growing in the bush around us years ago when we lived in Bayswater, in very hard-packed clay near some creeks, with a small amount of leaf litter but always surrounded by bush moss. Sometimes the bush moss would be ¾" (25mm) high and the little Lindsaea would be just poking out of it. We lifted quite a bit of it over about six years because the area was under subdivision but in that soil it is extremely difficult to dig out a decent root ball and the only real success we had was with one plant which survived for three seasons. One thing we didn't do was test the pH of the soil. We put it into slightly more noble mixes than the bush clay as it is very difficult to use the natural clay soil in a pot successfully.

Of the sixteen species listed in Jones and Clemesha, all are described as difficult, very difficult or unknown to establish or keep growing in cultivation. In the case of *L. linearis*, we can vouch for that! If anyone learns how to grow it, please tell me because it is a very pleasant little plant which I would very much like to grow. So I leave you with the challenge!

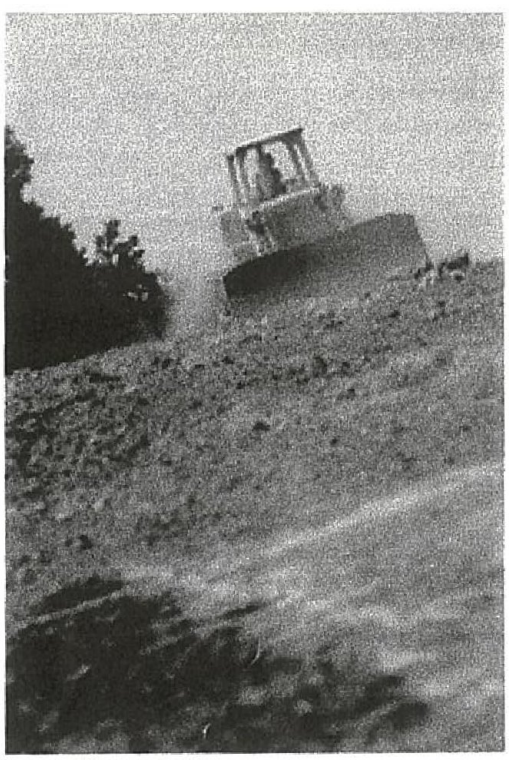
LLLL

"SOILS AIN'T SOILS" AND MINERALS AREN'T ALWAYS MINERALS

Confronted by the array of plants and products at a nursery or garden centre, quite often confusion reigns supreme in the mind of the gardener - and when it comes to growing media and nutrients the situation becomes complicated even further because 'soils ain't soils' - and minerals ain't all minerals. Let's look at a few of the mineral additives that are available and see where they fit in.

The mineral story begins in a quarry, where the mineral is carved out of the ground and then finely crushed. What happens then depends on the type of rock and how it is treated.

Perlite is manufactured by rapidly heating volcanic glass to about 1200°C. It is sterile immediately after production and has no water holding capacity at all. Its main use is in lightening up potting mixes. It is quite expensive.



Vermiculite is manufactured from a flaky type of clay that occurs naturally in many parts of the world. It is heated to 1000°C to form flakes. Because vermiculite is expensive, it is not normally used in potting mixes any more. However, it can be used as a covering for seeds to help germination because it retains lots of moisture.

Zeolite is a product that is probably not used enough in the home garden. It occurs naturally in various parts of Australia. It holds on to plant nutrients such as ammonium, nitrogen and potassium, which carry positive electrical charges. These are then attracted to, and held by, any negatively charged surfaces in the soil profile. If there aren't any, then those nutrients are leached through the soil and lost to the plant. Because zeolite has a honeycomb structure and carries strong negative charges, it is able to catch and hold those positively charged cations for the future use of the plant.

All Australian soils are low in potash because it usually leaches out but zeolite grabs hold of those nutrients and hangs on to them so the plant can pull them off later on. If it is windy when using zeolite, it is advisable to protect your eyes with goggles.

Work this stuff into your garden - it works miracles.

Mineral rock dust is just that; the dust of finely ground rock. It contains most of the nutrients a plant needs, which are slowly released by microbial action and also by the acidity of the soil. That's important in high rainfall areas. I believe that some gardeners in Tasmania use rock dust for great results in their gardens. In the home garden, all you have to do is broadcast it over the soil either before or after planting.

Granulated minerals. It is also possible to get mineral dust with enhanced nutrient status. These nutrients are bound together in little granules using benzenite, which not only hold the particles together but also provides calcium. This is also broadcast over the soil, before or after planting.

If you are using these materials in your garden, particularly the silicous materials like Perlite and Vermiculite, always wear gloves while handling them and wear a P2 mask which will prevent you breathing in any of the fine material which can cause symptoms like asbestosis.

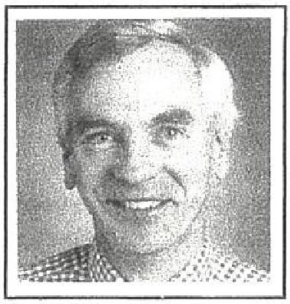
If you are contemplating changing over to mineral dusts, remember that they are slow release so you will need to gradually phase out any other fertilisers that you have been using.

Next time you visit your nursery, don't hesitate to ask for advice as to the right product to use. These days, due to their fairly high cost, some of the expanded minerals need to be used with a bit of discretion. And don't forget, zeolite is the one to look out for.

The contents of this article come from a 'Gardening Australia' segment which I found quite enlightening. I hope you do too.

Lyn Gresham. ✣✣✣

CASE STUDY.
RICHARD BISGROVE.



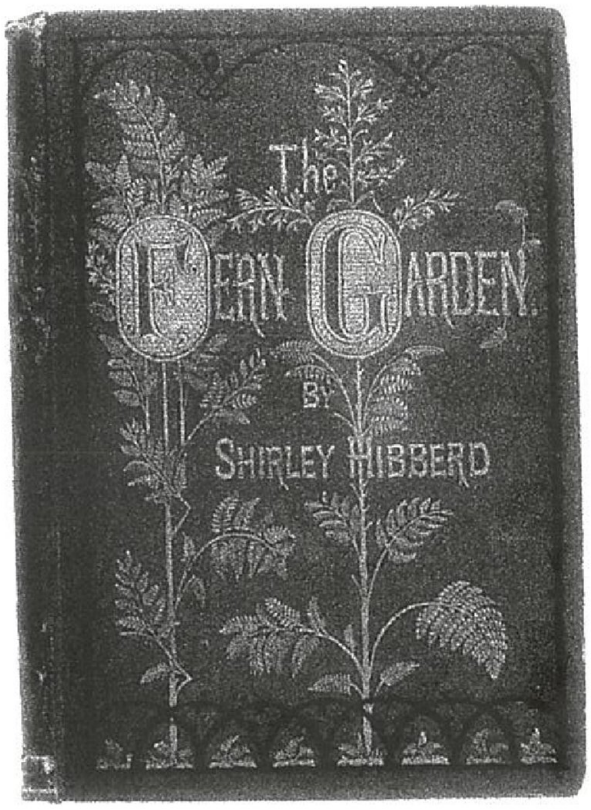
Richard Bisgrove is course director of Landscape Management at the University of Reading (U.K.)

The Victorians, with their taste for the gaudy and ornate, were, curiously, gripped by an obsession in the mid- 19th century for the unshowy fern. Pteridomania reached manic proportions, with native ferns being stripped almost to extinction. In a garden, ferneries were the ideal for housing a fern collection, but, as Richard Bisgrove relates, the Wardian case, a miniature hothouse, was the answer for middle-class urban collectors.

True to Francis Bacon's assertion that 'Men come to build stately sooner than to garden finely', nearly a century elapsed between the first enthusiasm for the picturesque, for Gothic architecture and rocky ruins in the early 18th century and the evolution of the fernery. It was undoubtedly the enthusiasm for ferns of George Loddiges, one of London's most eminent nurserymen, which signified the beginning of their move from minority interest plant to major cult, a move also stimulated by the growing interest in field botany in the 1830s.

George Loddiges was blessed with a happy knack of having in his enormous personal collections exactly those plants which enthusiastic collectors later wanted to buy. By 1825 he listed 100 species of ferns in his Hackney nursery. Among his like-minded friends it was Dr Nathaniel Bagshaw Ward who made the most important single contribution to the fernery.

In 1831, Dr. Ward, a physician working in grimy Whitechapel, noticed a fern growing in soil in a bottle in which he was keeping a chrysalis. He experimented with other plants in glass cases, including delicate filmy ferns, and presented his observations to the Linnaean Society in 1833. In March 1834, John Loudon visited Ward, and was enchanted to discover his house filled with 'fern cases'. With Loudon's championship in his *Gardener's Magazine*, the Wardian Case or fern case quickly became an essential in every respectable parlour. With the high humidity of the Wardian Cases, ferns thrived in these darkly furnished drawing rooms, their beauty and simplicity a silent reprimand to the decorative excesses of the cases themselves.



Ward's discovery coincided with Robert Chance's development of sheet glass in 1832, and Joseph Paxton's use of it in the Great Conservatory in Chatsworth (1834-6) heralded a new era in glasshouse design. Abolition of the glass tax in 1845 and the celebrated example of Paxton's Great Exhibition building, the Crystal Palace in 1851, further stimulated a passion for glasshouses and winter gardens: walk-in Wardian Cases.

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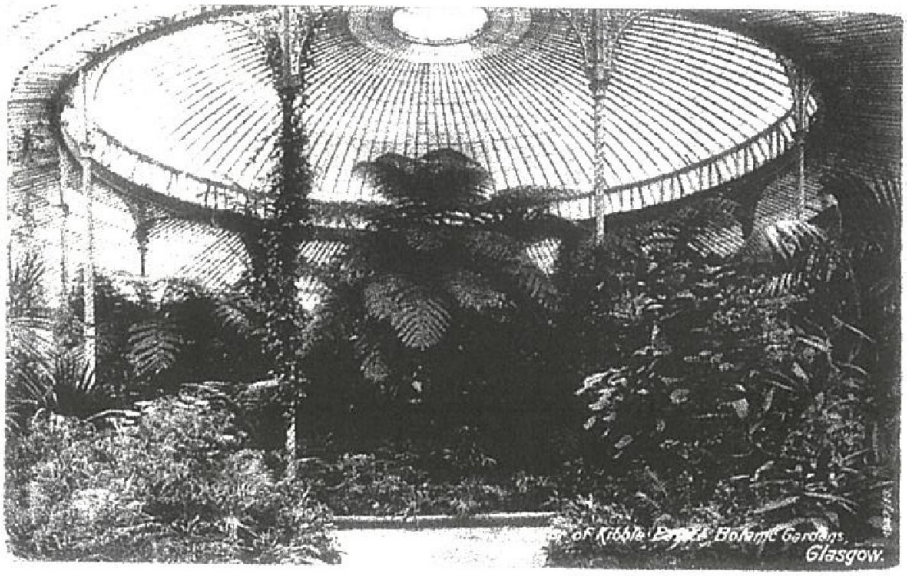

The taste for gaudy Victorian bedding schemes was paralleled by a passion for ferns, which combined simplicity of form, delicacy of poise and exquisite detail. In 1840 Edward Newman reported 'the cultivation of Ferns is becoming a fashionable pursuit... almost everyone possessing good taste has made, more or less successfully, an attempt to rear this tribe of plants.' By 1856 the *Gardener's Chronicle* commented on 'that prevailing taste for exquisitely beautiful foliage which is rapidly replacing more gaudy flowers in the public favour.'

Soon after his triumphal Crystal Palace, Joseph Paxton designed a fernery at Tatton Park in Cheshire, to house tree ferns and other varieties brought back from New Zealand by Captain Charles Randle Egerton. Also in the 1850s, at Ashridge in Hertfordshire, Matthew Digby Wyatt, who had been secretary of the Great Exhibition, converted Repton's flower gallery into a rock-encrusted fernery and linked it with the rocky entrance to Repton's picturesque tunnel. At the other end of the scale, a cupboard-sized fernery at Acacias, the elegant new home of George Palmer, partner in the thriving biscuit manufactory of Huntley and Palmer in Reading, led from the drawing room through a rocky tunnel and into the garden.

The rock work in these examples provided contrast to the delicacy of the ferns. Jane Loudon, John Loudon's young widow and herself a prolific author, advised that most ferns 'would form a very elegant adornment for a grotto.' by 1856, Shirley Hibberd's *Rustic Adornments for Homes of Taste* showed a reversal of roles: rocks as an appropriate adornment for the fernery. Hibberd recommended coke, moistened and dusted with Portland cement, as suitable for fern cases. In his *Fern Garden* of 1869 he warned, though, that anyone starting off with a humble fernery in the drawing room would soon wish, inevitably, for a grander scale: 'I am satisfied that where space can be afforded the imitation of a ruin is the best possible central idea out of which to develop a fernery'. He warned, though, against using 'gewgaws, coral, shiny shells and plaster casts' in a fernery of taste.

Stumperies (mounds studded with inverted tree stumps) were also considered by Hibberd and others to be ideal homes for ferns. David Thompson, author of *The Handy Book of the Flower Garden*, enthused over the hardy fernery as 'one of the most delightful departments of a pleasure garden', an escape from the glare and 'somewhat still and formal trimness' of the flower garden, 'a most refreshing change to body and mind.'

Inevitably the demand for ferns and ferneries had devastating effects on the natural fern population. Fern touts were already plying their trade outside the Bank of England in 1840 and by 1880 organised gangs were stripping bare whole areas of countryside to feed an apparently insatiable pteridomania. As the ownership of a complete collection of the limited number of the British species became increasingly easy, avid collectors moved on to collecting mutated varieties - frilled, crested and contorted variants which, once named, swelled the pages of specialist catalogues with many hundreds of ill-defined cultivars.

(Continued on page 10)

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However, when even the lower orders could proudly show their heap of clinker draped with the shrivelled remains of ferns bought from street hawkers, any illusion of the fernery as an indicator of refined taste was dispelled.

William Robinson is sometimes accused, quite wrongly, of causing the demise of the fernery by suggesting that ferns be grown in the open instead of being left to languish in dark corners. In fact, what he advised was the mixing of ferns with flowering plants. Robinson's associate and friend Gertrude Jekyll had 'a bank of fern beauty' in her garden at Munstead Wood, cleverly interplanted with hellebores, hemerocallis and bergenias to accentuate the fine-textured fronds of the ferns.

One of the last and most ambitious ferneries in Britain was made at the turn of the century by another of the Robinson/Jekyll circle, Ellen Willmott, in her garden at Warley Park in Essex. Miss Willmott ploughed her very large fortune into her garden, one feature of which was a rocky ravine strewn with hardy ferns and leading down into the ground to open into a glass-covered chamber for tender ferns. Miss Willmott's fernery is a notable link between the some times excessive exuberance of the 19th century and the more restrained landscape-with-plants which typified the early 20th century, spawning a host of smaller rock-garden-ferneries.

Over the years, ferns retreated to the quieter corners of gardens. Yet, with the gradual rediscovery of those hardy ferns which bring joy to the darker corners of small modern gardens, ferns and ferneries are undoubtedly due for a comeback - but no gewgaws, please.

The British Pteridological Society, c/o The Natural History Museum, Cromwell Road, London SW7 5BD. Write for membership details.

The Victorian Fern Craze *by David Allen, Hutchinson, 1969, (out of print).*

The Fern Garden *by Shirley Hibberd, Groombridge, 1869.*

Ferns to Know and Grow *by F. Gordon Foster,* Timber Press, 1993, ISBN 0 88192 234

This feature by Richard Bisgrove first appeared in *Gardens Illustrated* magazine. For subscription enquiries please call 0011 1454 618 905.

My thanks to Mary, Reg and Damian Kenealy for gaining permission by E-Mail to reproduce it from the November '99 issue of this British magazine. It was a delightful and appreciated gift to the busy editor!

**

Part 2 of the Speaker Report - Meeting held in September, 1999. Reviewed by Lyn Gresham.

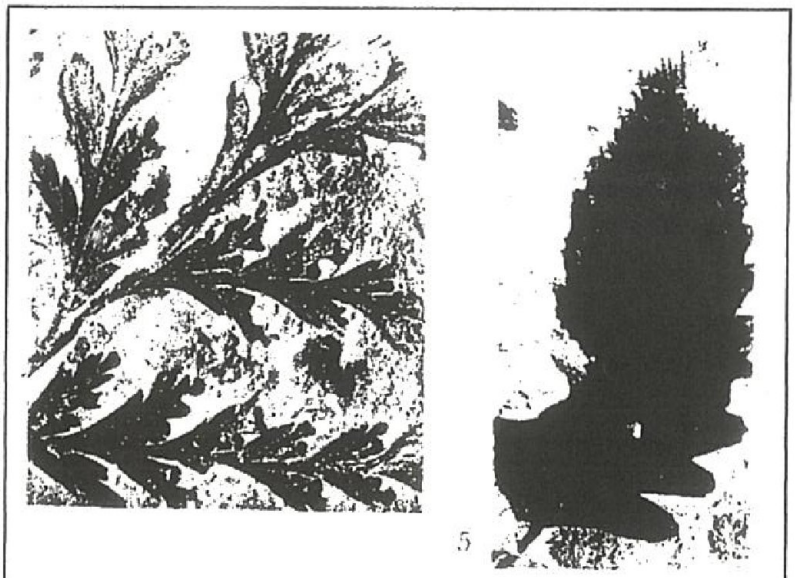
FERN FOSSILS II.

Jack Douglas

The Fossils.

Ferns (and other fossils, of course) are preserved in a variety of ways. By and large you find the surface parts of plants, though underground rhizomes and more rarely roots are also preserved.

The Cretaceous was a geological period in Victoria, and probably all over the world, when there was a lot of land water about. In Victoria we have described nearly fifty different ferns. However, because we find fragments of fossils, never a whole plant, and because plants vary sometimes, it is possible that in some instances we are 'finding' species that have already been found and named. There is constant development of ways to identify often fragmentary, faint or otherwise difficult ones, such as chemical treatment if the fossil has been **compressed** and fragments of plant material remain.



(L)*Sphenopteris warragulensis* and (R) a Pteridosperm leaf, both dating from the early Cretaceous period.

Let us consider how plants became fossils. *Dispersal of plant material takes place both during life and after death. During life the most widely dispersed are the reproductive organs, whether in the form of pollens and spores, or seeds and fruits. Of these it is the pollen grain or microspore, which by virtue of microscopic size, lightness, and resistance to decay is disseminated furthest and in greatest numbers. These spores have protective outer layers (exines) of waxes which enable them to survive the processes of fossilisation, subsequent weathering, and facilitate chemical removal from the encasing rock, and are one of the most valuable tools for stratigraphic subdivision and correlation. A specialised branch of the science called palynology is based on these fossils ... It is with the vegetative and microscopic fertile organs of the plant; that is, leaves, stems, seeds, fructifications and woods, some released during life, many only available after death, that palaeobotanists can most easily become familiar, and obtain an idea of the plant life in a particular rock sequence.

There are three main kinds of plant remains

1. **Coalified or silicified plants**

Immense thicknesses of coal in Victoria and elsewhere are composed almost entirely of plant remains. In some older coals, such as that formerly mined from the Cretaceous rocks of Wonthaggi, coalification has proceeded so far that plant composition or anatomy are obscured or lost, but in younger coals, such as at Yallourn, much woody, foliage and reproductive material remains.

Silicification, a process whereby silica replaces woody tissue, results in the preservation of the internal anatomy of heavy stems and logs. Such material can then be cut into thin transparent sections and examined under the microscope.

2. **Impressions**

The plant material may be removed during fossilization leaving an impression (just as a footstep in mud). Sometimes internal parts leave impressions after external layers have rotted away or been removed.

3. **Compressions**

If erosion or weathering is not complete, and if the organ preserved resists decay, some of the internal structure of the plant will be preserved. Woody tissue may remain relatively unaltered, and in particular leaves with thick or resistant cuticles may retain much of their epidermal anatomy.

The most common readily recognisable part of the fossil plant is the leaf ... The impressions and compressions of small stems are also common, but can be most difficult to identify by even the most experienced worker.

Considering the many unpredictables surrounding the fossilisation process, it is surprising that we have

such a good record of the ancient floras. Before any fossil plant comes to our attention,

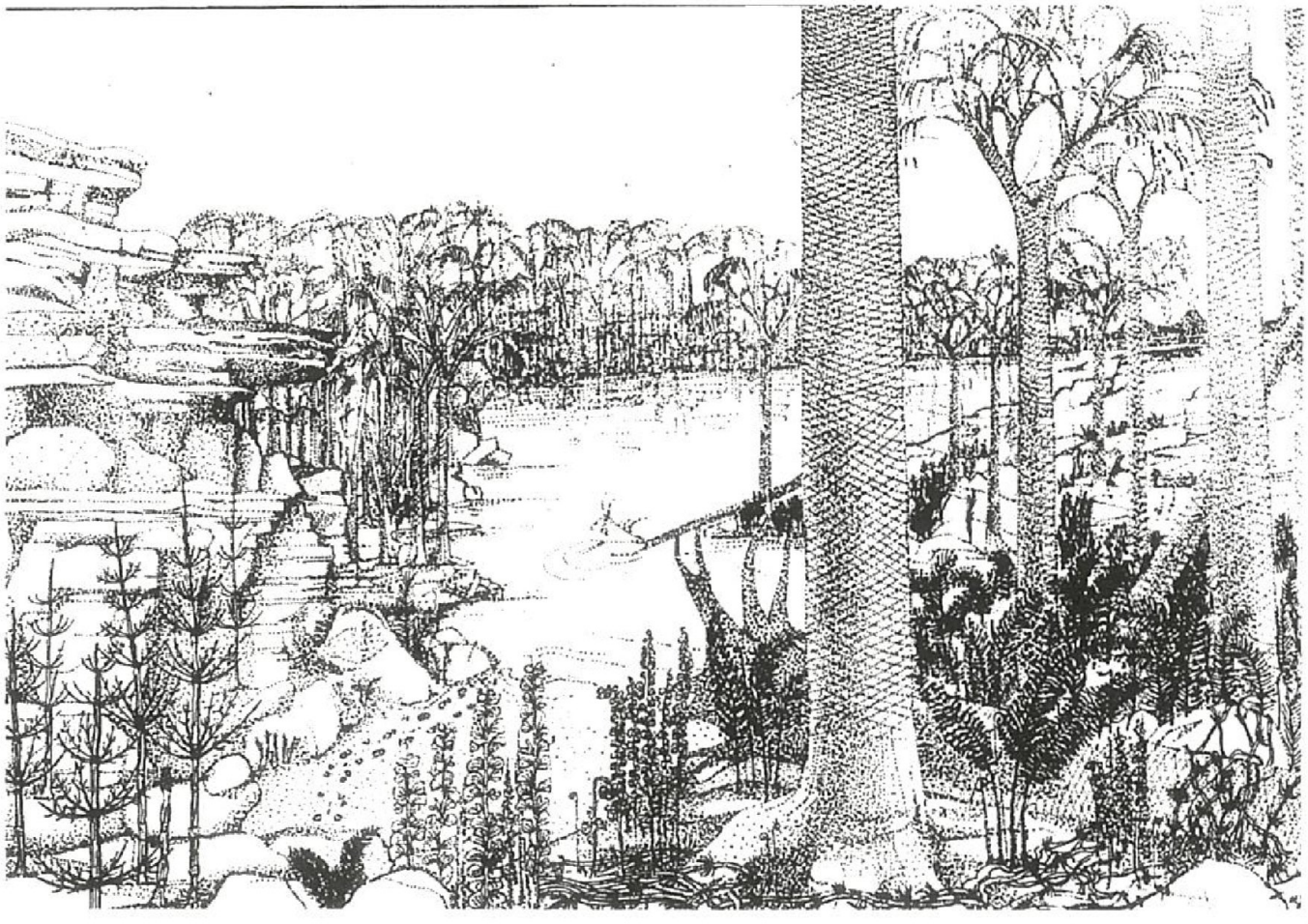
1 It must be shed, fall, or somehow be transported into an area where sediment accumulation is proceeding.
2 It must not decay, be blown away, eaten or otherwise removed before it is covered by accumulating sediment.
3 Once entombed it must not be destroyed by erosion, overwhelmed by natural catastrophe, or so altered by metamorphic process that it becomed unrecognisable.

It must be preserved in a consolidated sediment, and exposed just sufficiently by erosion to facilitate extraction. **

Fern fronds and plant debris from the Cretaceous age,

□ *From * to ** was extracted from "What Fossil Plant is that? a guide to the ancient floras of Victoria" by J.G. Douglas. It is included although Jack did not cover this material in his talk to us.*

One of Jack's quotable quotes was, "Do go away knowing that these beautiful plants (ferns) from a wonderful niche in the biota of many parts of our planet, and particularly many parts of Victoria, have a long and most intriguing fossil record. We do our best to relate them to our present-day things but certainly use them in our knowledge of relating them to other plant life of their time and the wonderful story of life on Earth." □□



Artist's impression of Yambulla Creek, Genoa River area late in the Devonian period. A large stream is shown, with igneous activity evident on the far distant right. The *Lepidodendron*tree dominates the vegetation, but fern-like foliage (*Archaeopteris, Rhacopteris*) forms ground cover, and sphenophytes clamber over the ground and fallen *Lepidodendron* and form thickets in boggy areas. Tracks indicate the presence of and early amphibian.

ANNOUNCING:

The Release of a New Fern Book;

Australian Ferns - Growing them successfully

by Calder H. Chaffey.

Two or three members who have had a good look at this Australian publication recommend it as a very good source of comprehensive fern growing information. As such, it will complement the purely scientific 'field guides' of ferns in your personal library. It is not intended to be a field guide or identification tool though the abundance of good photographs of ferns will assist this process. It has good, readable descriptions of species and various sections of cultivation tips including a comprehensive growing zone section with diagram(s).

'While Dr. Chaffey practised medicine for forty years, he devoted much of his precious spare time to the study of botany. Since his retirement he has studied the taxonomy of ferns almost full time, travelling widely in Australia and the south-west Pacific in search of ferns in the natural state, photographing and describing them. He has used this experience to successfully cultivate a large number.

Dr. Chaffey is a member of the Society for Growing Australian Plants (SGAP), Far North Coast Group NSW, and the SGAP Fern Study Group.'

The book sells for $60 (RRP) though the Society hopes to secure a discount for a group order, which would be passed on to purchasing members.

Direct enquiries and expressions of interest to Ian Broughton soon. Telephone 03 5964 6402 Fax 5961 5831.

A NOT-SO-LUCKY FOUR LEAFED CLOVER

Burke and **Wills** - two simple names yet together they hold the power to evoke images of adventure and calamity. In 1861 Robert O'Hara Burke and William John Wills, along with John King and Charles Grey, became the first Europeans to cross Australia from south to north.

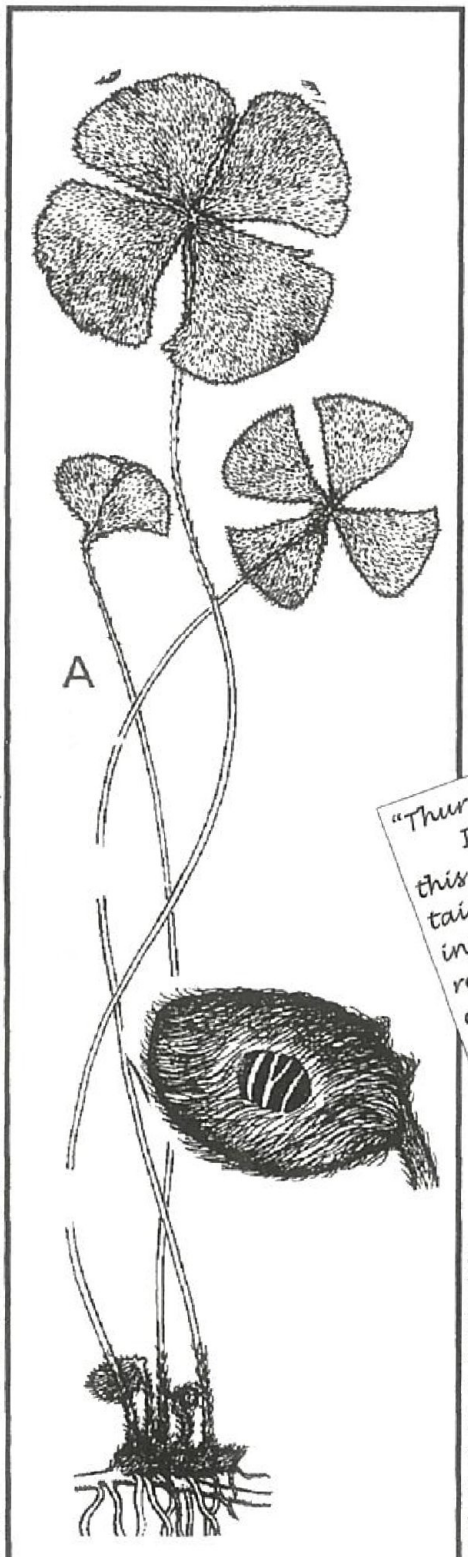
But the price of glory was high. All but King died of starvation - or did they? Dr. John Earl, biochemist at New Children's Hospital, is convinced that they didn't die of starvation. Instead they died of enzyme poisoning from eating an Australian plant. Dr. Earl's theory is not brand new but research such as his could finally lay to rest the Burke and Wills mystery.

The explorers were already at Cooper Creek in south west Queensland, preparing to head north when Burke heard that there was a rival expedition on its way to the Gulf country.

At Camp 65 they divided. Four remained at camp while, against all advice, Burke, Wills, Grey and King headed north into the unknown - at the hottest time of the year. Burke pushed the team relentlessly and as a result Charles Grey died.

Despite Grey's tragic death, Burke managed to guide his team back to Camp 65 but the hardships and delays meant that they were over a month late and literally just a few hours before their arrival, the depot party had left. Before departing they buried some provisions near a tree at the campsite. In fact, until very recently you could see "dig 3 feet" carved into the trunk of the tree.

The food didn't last long, however, and soon the men were forced to fend for themselves. Instead of using their guns to shoot game or catching a meal on their fishing hooks, the explorers turned to Nardoo, or *Marsilea drummondi*. Now this little plant may look like a four-leafed clover but it's really a fern. For instance, when the leaves unfold they uncurl the way a fern does and instead of having seeds it's got sporocarps, little fruiting bodies that contain the male and female reproductive organs



Nardoo

-the 'killer' fern

According to Dr. Earl, an amateur historian it was the sporocarps that got the explorers into trouble. His evidence? The words of Wills himself. Possibly the most important relic of the expedition is kept at Australia's National Library in Canberra. It is the fragile, waterstained notebook of William John Wills. He was such a meticulous scientist that up to the very end he was making and recording observations. In fact it was some of his entries that support the hypothesis that some of the party was poisoned by Nardoo that wasn't properly prepared.

"Thursday June 20th, 1861. I cannot understand this Nardoo at all. It certainly will not agree with me in any form. We are now reduced to it alone. Our legs almost paralised, so that each of us found it a most trying task only to walk a few yards. My legs and arms are nearly skin and bone."

Pain, weak legs, unsteady gait, limbs reduced to skin and bone; those very symptoms once plagued the sheep paddocks of western New South Wales until Dr. Barry McCleary, then of that state's agriculture department, had tracked down the cause. It was an enzyme in a fern very similar to Nardoo, which the stricken animals had eaten. When McCleary had shared his findings with Dr. Earl, Earl made the connection with what happened to Burke and Wills' expedition, knowing they had eaten Nardoo. It seemed to him a good possibility that they might have been poisoned in the same way as the sheep - by the Nardoo.

The sporophytes of Nardoo contain an enzyme called thiaminase. When crushed, the thiaminase is released and is freed to lock on to other molecules but in the process thiamine, or Vitamin B1, is destroyed.... not only in the Nardoo but in any other food eaten at the same time.

In the past, aboriginals neutralised thiaminase by washing the crushed sporocarps, but if this is not done, a sheep (or an explorer) eating Nardoo will develop a thiamine deficiency, a condition known as beri-beri.

At one stage Wills found it difficult to actually crawl down to the creek to get a billy of water, and the mental confusion is very interesting in terms of the historical story of Burke and Wills and some of the poor decisions that Burke made when they reached Coopers Creek. There were many poor decisions. For instance, Burke insisted that they trek, unsuccessfully, towards Adelaide instead of following their backup party to Melbourne. He took potshots at aborigines, and the Wangkamara report a particularly shocking event, not revealed until now.

Cecil Ebswort, Wangkumara Elder: "Dad said the (old) people told him that they turned . . you know, had a bit of a chew on one of them. Which one I don't know, but that's when the aboriginals gave up on following them around and trying to help them. They knew they were finished anyway, one was already dead and another fellow wasn't far off. When they saw the cannibalism they didn't want anything to do with it - that's not our way. So they went back to the camp, found King there and looked after him."

So Burke and Wills died. And King would have too, if, despite their reservations, the Wangkumara people had not sheltered him until he was rescued.

Documents suggest that King continued to show evidence of beri-beri throughout his life.

But this is all circumstantial evidence for the Nardoo poisoning theory. In the bowels of the Mitchell library is a box containing material from the Burke and Wills expedition, lithographs, documents and Nardoo seeds, plus (get this!) a little bit of hair snipped from Burke's head with a pen-knife.

To a forensic scientist, old hair is nothing new. With the help of high-tech. instruments such as maspectrometers and gas chromatographs, Olaf Drummer of the Victorian Institute of Forensic Medicine and his collegues often wring vital clues as to the cause of death from assorted body bits. The key is a marker, a biochemical substance associated with the cause of death. If they can identify a marker in a sample, eg., a hair, they can extract out that marker and analyse its presence in the sample. This is a time-consuming process, particularly difficult because of the age and condition of an old sample.

The end of the story is tantalisingly close but until a marker is found, scientists, like historians, cannot solve this whodunnit. Was it European arrogance, simple ignorance - or an odd little fern with a deadly punch?

The information in this article comes from Quantum, a science programme broadcast by the ABC some time ago.

COMPETITION WINNERS IN FEBRUARY 2000

Cheilanthes, Notolaena, Pellaea and Astrolepis.

1. Ian Broughton, *Cheilanthes myriophylla* (Central American Lace Fern)
2. Dorothy Forte, *Pellaea hastata* (Sickle Fern)
3. Ian Broughton *Notholaena* sp. Peru (possibly *N. nivea*)

3 (equal) Ian Broughton *Pellaea* sp. Kenya

Exhibitors' Draw; Keith Hutchinson

Special Effort; Reg Kenealy, Terry Turney, Jean Boucher, Jack Barrett, Norma Hodges.

Congratulations to all exhibitors on a splendid display of ferns!

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