James Merryweather - ed.

EDITORIAL

SORRY. I must start with an apology because **Pteridologist** is late this year. Yes, very, very late. But I can explain. When I was editor before, my target date for delivery was 13th May. To achieve that in 2002, even if in the old style, I would have needed copy by mid March at the very latest. At that stage there was absolutely nothing to add to what I was panic writing myself. **Pteridologist 2002** had to be put off for a couple of months. With a new volume beginning, the right decisions had to be made a.s.a.p.

With the publication date looming, the BPS publications committee was still considering whether or not to increase page size to A4. That was approved by the AGM at Ness Botanic Garden, but people were already suggesting further improvements. Could we afford to use more colour, and how much? To my surprise, the president asked me to discover whether full colour would be feasible. I got estimates from printers and reported back with some surprisingly reasonable prices. The change to the standard A4 had resulted in savings and the four colour process is cheaper than it used to be. It was decided that if we were going to bring **Pteridologist** up to date, then you would enjoy and could afford full colour, so I should go ahead. That had been my ambition for a long time, but in my enthusiasm I failed to foresee the enormous challenge I would have to confront. I had been given a free(-ish) hand to redesign **Pteridologist** but it was likely to take a long time for a brand new and more complex style to take shape from zero.

I leafed through piles of other publications of a similar sort. The best, such as *Plantlife* and *Botanics* (RBG, Edinburgh), were obviously created by top professionals with unlimited resources and high-powered computers. The **Pteridologist** team consists of a domestic PC, some affordable software and me. Other magazines I used for reference - I will not name and shame - were dull and lacklustre or just badly designed and horrible to read. I could not (for certain reasons, dare not) emulate the former and wished only to learn from the mistakes of the latter. Even so, I had to please the BPS membership as well as gain the approval of a wide range of opinion on the committee. Interestingly, *Mammal News* came to my rescue, a newsletter that had been developing in York alongside **Pteridologist** during my last spell as editor and about which its editor at the time, otter man Gordon Woodroffe, used to consult me. *Mammal News* has overtaken us, but its friendly yet achievable design was of great assistance and comfort to me as I wrestled with my charge.

Just getting a new format into my mind was likely to cause significant delay, but I thought that in retirement I'd have the free time to tackle it. No chance. I have more projects in the pipeline than ever, and 2002 turned out to be an incredibly busy and exciting year as will become evident when my address changes from York to Wester Ross. Unfortunately, my cheap desktop publishing software has its limitations, the slide scanner went on the blink and the computer kept crashing. **Pteridologist** literally took months of my time and caused severe greying of the hair as illustrated above. However, once the cover had begun to take shape and a satisfactory version out of a hundred or so drafts emerged from my printer, I felt invigorated and developed the head of steam necessary to create the interior while you all enjoyed the September sunshine. Despite numerous interruptions, I was able to plough on and at last produce what you are about to read and, I fervently hope, enjoy.

I trust the cover design I eventually chose, of which I'm insufferably proud, was a pleasant surprise. I was obliged to devise a house style for both cover and contents, but this is by no means the final format, more a basis for evolution. The new look **Pteridologist** needs time to continue its development, just as it did from 1993 to 1997 (have a look at those back numbers). Only that unwieldy word "Pteridologist" spoilt the design. If only we could think of a snappy, five-letter title, perhaps beginning with, oh, what about F?

I'd appreciate your opinion, but please be gentle in your criticism. Thousands, perhaps millions of minute, important and crucial decisions have gone into the construction of this magazine and I will be the first to recognise the faults as soon as I open the printed reality. If you look at other magazines of this type you will see that the designers use colour for everything - backgrounds, borders and text - and many stunningly imaginative features. Text sweeps gracefully around irregularly-shaped illustrations and rectangular pictures are swivelled from the horizontal. Real designers use illustration to the full and also leave a lot of clear space on the page, something I've not dared to do yet because that is one thing our society's most vocal critics despise. To them it represents wasted paper and, therefore, wasted money. Therefore, I have covered page space at the expense of you, the reader's, comfort. Look at the density of Adrian Dyer's article, not the author's fault but mine. If I'd had the courage to 'waste paper', then I could have made it a four-pager with plenty of open space, more illustrations (perhaps even decorative as well as relevant) and it would have been much easier on the eye.

Please tell me if you'd like me to use more **DESIGN** in **Pteridologist**. Believe me, the critics will have their say, so I must hear from you if you agree with me . . . and please, if you have something to write about pteridophytes, send it to me a.s.a.p. for the 2003 edition which I now feel I should be able to issue back on schedule, next May.

INSTRUCTIONS TO AUTHORS

Pteridologist *welcomes contributions written in English on all aspects of the natural history and horticulture of ferns and related plants, as well as articles about ferns in literature, art, architecture, music, furniture, folklore etc. in fact, anything fern-related.*

SCRIPT: *Ideally* text should be provided in the form of a WORD, RTF or TEXT file on a floppy disc, CD-ROM (PC or MAC) or e-mailed. Typescript can be scanned (manuscript can be laboriously typed). Please check spelling ✓ grammar ✓ and meaning ✓ with care because I get very tired and cross dealing with these fundamental aspects of communication. One space between sentences, please.

CONVENTIONS: Scientific names should be in italics, the authority normal thus: *Polystichum setiferum* (Førssk.) Woyn. If typed, underlined thus: Polystichum setiferum (Førssk.) Woyn. If munuscript thus: *Polystichum setiferum (Førssk.) Woyn.* Variety names should be in normal type, capitalised and enclosed in single inverted commas thus: *Polystichum setiferum* 'Plumoso-divisilobum'. Common names should be in lower case thus: soft shield fern

ILLUSTRATIONS: I have scanners so please send line art, photo prints, negatives or 35 mm slides which I will return. If supplying silhouettes ensure they are of a reasonable size for the article and as dark as possible on a pure white background. Please do not fold illustrations when sending.

Please feel free to discuss your ideas: ☎ 01904 431328 (Until end of January 2003) 💻 james@ebps.org.uk

PTERIDOLOGIST 2002

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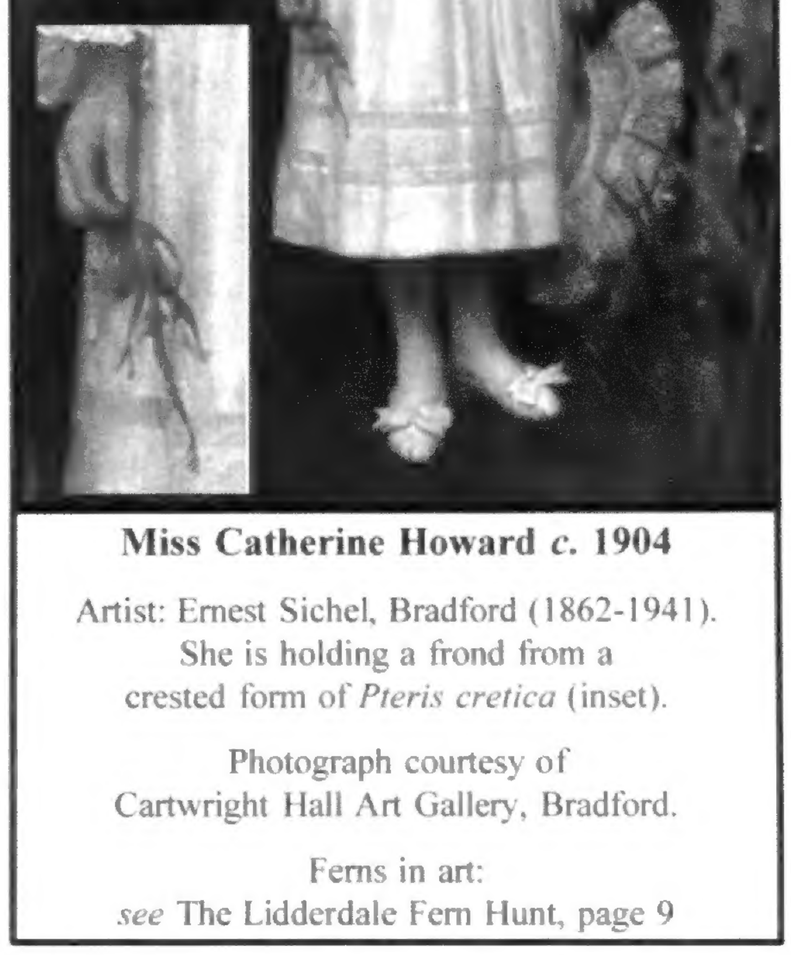
Unless stated otherwise, all photographs were supplied by the authors of the articles in which they appear.

Cover picture: *Polypodium vulgare* (right) and *P. cambricum* growing together on a tree trunk near Lawrenny, Pembrokeshire (see page 14).

Corrigendum

We apologise to Stuart Lindsay, the author of the book review *Pteridophytes of Thailand*, whose name was unfortunately omitted (**Pteridologist** 2001, volume 3, part 6, page 164).

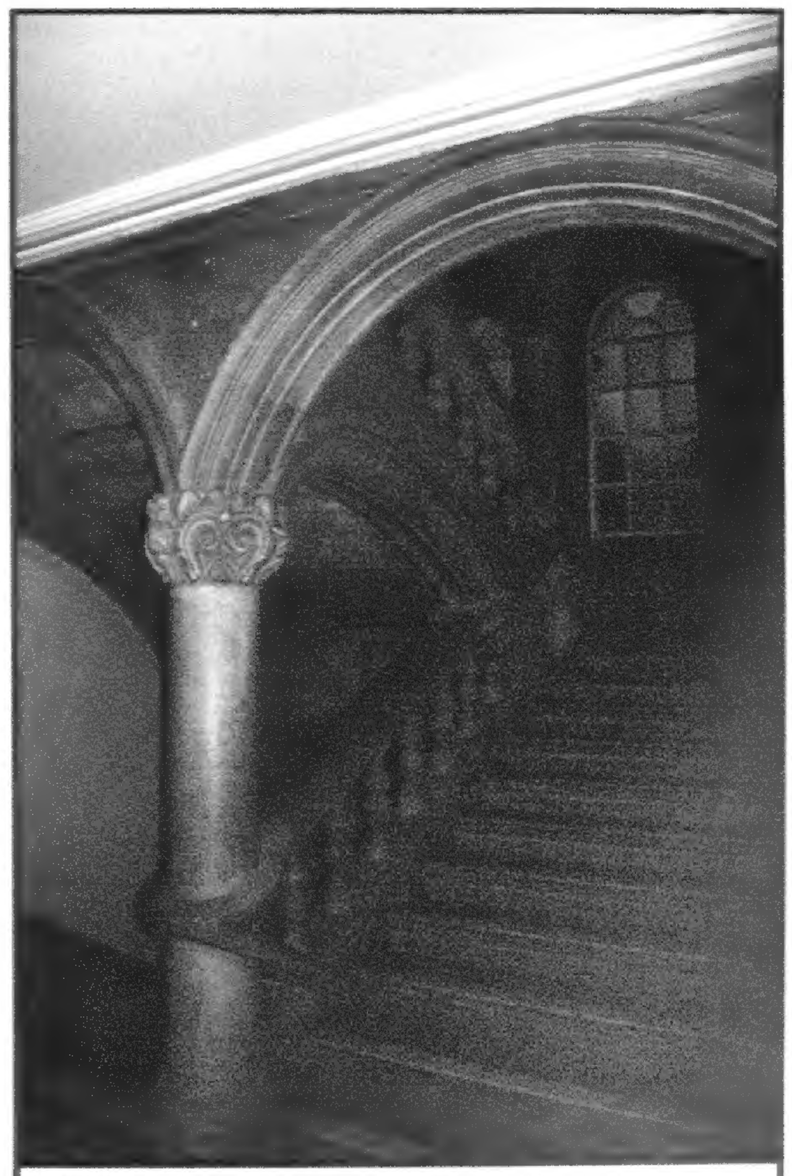


Miss Catherine Howard *c.* 1904

Artist: Ernest Sichel, Bradford (1862-1941). She is holding a frond from a crested form of *Pteris cretica* (inset).

Photograph courtesy of Cartwright Hall Art Gallery, Bradford.

Ferns in art: *see* The Lidderdale Fern Hunt, page 9



Pillar capital decorated with hart's tongue on a stairway in Founder's Building, Royal Holloway College, University of London (*enlarged left*).

NEWS & COMMENT

BRODSWORTH HALL

Jack Bouckley

Since the publication of the report about Brodsworth in the 2001 issue of *Pteridologist*, things have been progressing quite rapidly. All of the ferns from the late Eric Baker's garden at Wiswell have been planted into their permanent positions and the tree ferns now have their feet in this lovely part of Yorkshire. The complete site has been transformed into a truly wonderful fernery.

Here in the north of England we have had a winter with more frosts than we have seen for quite a few years and, in spite of this, all of the ferns, except of course some of the later flushing *Polypodium australe* varieties, are growing away in their new surroundings. The tree ferns look magnificent and everything is a joy to behold.

On Wednesday, 6th June 2001, English Heritage arranged a special day to celebrate the official opening of this new project. Many distinguished guests were present, together with reporters from the national press, garden correspondents from weekly magazines, and civic dignitaries. Rita Baker of course was present with Martin Rickard and myself representing the BPS.

About seventy people gathered in the "quarry" to listen to a few speeches and to look around the collection. We then retired to a marquee where we wined and dined before being shown round the gardens and the hall by members of Brodsworth staff. Rita, in her short address said: "I'm thrilled that this remarkable collection can now be seen in an authentic Victorian setting and enjoyed by the many thousands of people who visit Brodsworth annually".

It was a memorable day and on behalf of the BPS I would like to say "thank you" to English Heritage for giving Eric's ferns such a noteworthy home.

Brodsworth Hall gardens are open 11am-4pm from 1st April to the end of October (Mondays excepted) and also at the weekend out of season.

Rita Baker with Jack Bouckley

✉ LETTERS ✉

CEMETERY FERNS - In Dean Cemetery, Edinburgh, the imposing grave of James Valentine Hagart, 1845-1900, is planted with two large clumps of Royal fern arranged symmetrically at the base of an eight-foot high Celtic cross. It is difficult to believe that anyone not personally connected with the grave occupant would bother to plant them, suggesting that they were in place soon after Mr Hagart was interred. Perhaps planting ferns on graves was another manifestation of the fern craze, like carving ferns on gravestones. This would be impossible to detect with common species like hart's tongue, male or lady fern which occur naturally in the cemetery, and I wonder whether Royal fern had any special significance in relation to death or mourning or whether it was chosen just because it was a handsome ornamental.

Adrian Dyer

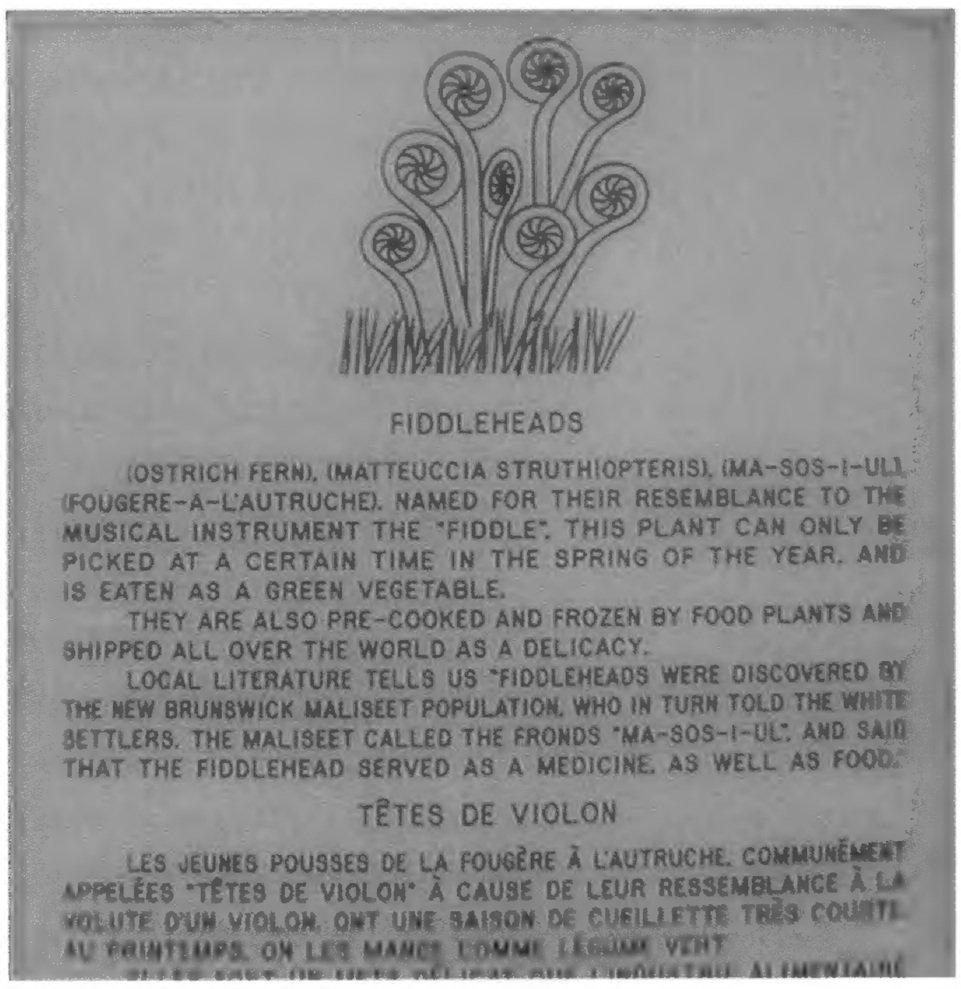
I predict this could be the beginning of a lively discussion of ferns in cemeteries, real and carved in stone - ed.

RECORDING FERNS ON DRY STONE WALLS - For anyone carrying out a survey of ferns on dry stone walls I would like to recommend that they obtain a copy of "Wall Surveys". This booklet gives a key to assessing the condition of the wall and also the land use on both sides of the wall. Another publication from the DSWA is "What's On A Wall", published by South Court Environmental Ltd. This includes a checklist for recording the flora and fauna found on a particular wall. Only 10 ferns are listed and I have already found three species on Skye walls that are not listed. We are told that the minimum age of a wall can be estimated by noting the plant species growing on it. For example if there is *Polypodium vulgare* present, the wall is a minimum of 7 years old, and 50 years is quoted for *Asplenium ceterach*. Both publications are available from the Dry Stone Walling Association of Great Britain, PO box 8615, Sutton Coldfield B75 7HQ. Tel: 0121 378 0493. Online orders: http://www.dswa.org.uk/

Mike G Taylor

NEWS & COMMENT

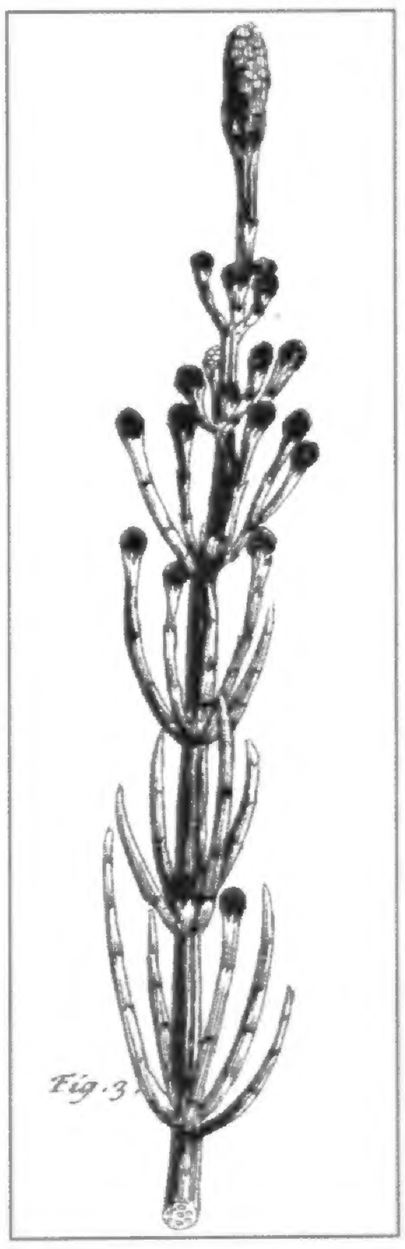
Giant Croziers



These enormous fiddleheads were discovered by Ted Munyard during a visit to Canada.
They are the centrepiece of the village park in New Brunswick, carved out of solid tree trunks and painted.

AN UNUSUAL HORSETAIL

James Merryweather



In 1724, John Ray, the Cambridge University botanist, described and illustrated an odd horsetail in *Synopsis Methodical Stirpium Britannicarum* (left). It was a version of *Equisetum palustre*, which bore cones on side branches as well as at the shoot apex.

> * 7. Equiſetum paluſtre, minus, polyſtachion *C. B. Pin.* 16. *Prod.* 24. *Buddle H. S.* Vid. Tab. 5. fig. 3.

In 1977, I found what seems to be the same horsetail, growing in Newtondale, beside the North York Moors Railway. I collected a bit, sent it to Chris Page and waited for his undoubtedly excited response. I had forgotten I was still waiting when, on 1st September 2002, I found it again (right), this time a mile or two north of the 1977 site, again between the railway line and wetland and bordering the Yorkshire Wildlife Trust reserve Fen Bog.

The "polystachion" shoots were associated with and grew among densely packed, normal shoots of *E. palustre*, many emerging between coarse limestone chippings at the colony margin. Some showed signs of damage at the tip which, I first thought, might have affected apical dominance, therefore a physical and, hence, hormonal cause of this multi-strobilate form. However, I also discovered a number of them on which, as in Ray's specimen, the apex was unharmed and, therefore, concluded that this might be a true genetic variety.

Is it possible that environmental influences might have caused this aberration? Increased pH due to the chippings seems unlikely and steam trains, which frequently incinerate plants by the railway during the summer, postdate Ray's pioneering studies of British natural history by a century. Any ideas?

Has this phenomenon been reported elsewhere? Has anyone else found a polystachion?

NEWS & COMMENT

RESCUING THE PAINTED LADIES

A R Busby

Some months ago, I was asked to advise on the planting of a small fern garden about 30% of which was in full sunlight for about five hours a day in mid-summer. The ferns were planted largely to my recommendations. However, in spite of my misgivings, *Athyrium nipponicum* 'Pictum' was planted in the sunniest part of the garden. Not surprisingly, they very quickly began to look very poor and by the beginning of July had lost all of their fronds.

From casual observation of ferns in the wild, I have often been impressed by various fern species thriving in spite of being in full sun. In every case they are able to withstand these no shade situations because they are rooted in a cool damp environment. A good example is *Cryptogramma crispa* on the screes of Corndon Hill in Shropshire. The screes are baking hot yet the ferns are unaffected because their roots are deep in moist soil beneath the scree.

Rather than discarding the *Athyriums*, I decided to place small pieces of stone, about the size of a house brick over the roots leaving a small space to allow fronds to develop. I used sandstone because it was all I had to hand. I also used broken terracotta roof tiles in the same way. Within a fortnight the ferns had begun to produce new fronds and by late August the plants looked quite respectable. In fact, the very bright situation seemed to have enhanced frond colour.

The application of stones, tiles or logs close to ferns enables us to plant them in most unpromising situations.

BRACKEN IN TRADITIONAL ANIMAL HUSBANDRY

John Grue

There are many reasons for visiting the valley of the Aspé in the French Pyrenees. Most people find the scenery, especially that of the Cirque de Lescun, a sufficient attraction. There are also some fine easy mountains to climb, one of the best areas of Karst in the Pyrenees and many species of alpine flowers and of ferns. You are quite certain to see kites and griffon vultures (we counted ninety-six cleaning the carcass of a pig on Pic d'Anie) and you should see many other raptors. When you have finished searching for the white backed woodpecker, the brown bear, the wall creeper and the ferns of the forests and cliffs, you will be charmed by the "Ecomusée de la Vallée d'Aspé".

The museum is in three sections, many kilometres apart, each devoted to a different theme. The museum at Sarrance illustrates the religion and folklore of the valley, especially their pre-Lourdes miraculous spring story. The one at Accous is about cheese and not too informative. However, the museum at Lourdios-Ichère has a fascinating set of displays on the current and previous life of the village, including the central place of the bracken ("la fougère") harvest in the former social life of the village.

The pastoral agriculture of the area is a complex integration of cows, sheep and pigs with a double transhumance, to the cheese making cabanes of the alpine pastures in the summer (the unfortunate pig mentioned above was there to be fattened on the buttermilk) and to the lowlands of Bordeaux in winter. The system was in decline, but has been rejuvenated in recent years, especially by the construction of new cabanes, conforming to the norms of the European Union.

The bracken is harvested in the autumn and used as winter bedding for the cattle. The museum contains a selection of photographs and examples of the tools used, including specialist tools for harvesting bracken. There is a set of sign posts distributed through the older part of the village which describe the people who lived there, their way of life and their history. One particular sign post describes vividly the harvesting of la fougère, the importance of waiting until the church bell signalled the starting time, the rivalry to collect the most bracken and the poaching of other people's allocations. The guide in the museum told us that it was worth keeping the bracken for longer than one year to improve its dryness.

I wonder if there are any other areas of Europe where this use of bracken continues? It appears to have died out completely in Britain during the last 30 years.

As we left the museum we were each presented with a bag containing three symbols of the commune: a piece of schist, a curl of harsh mountain wool and a piece of *Pteridium* frond.

NEWS & COMMENT

CHILEAN BLECHNUMS

Alan Ogden

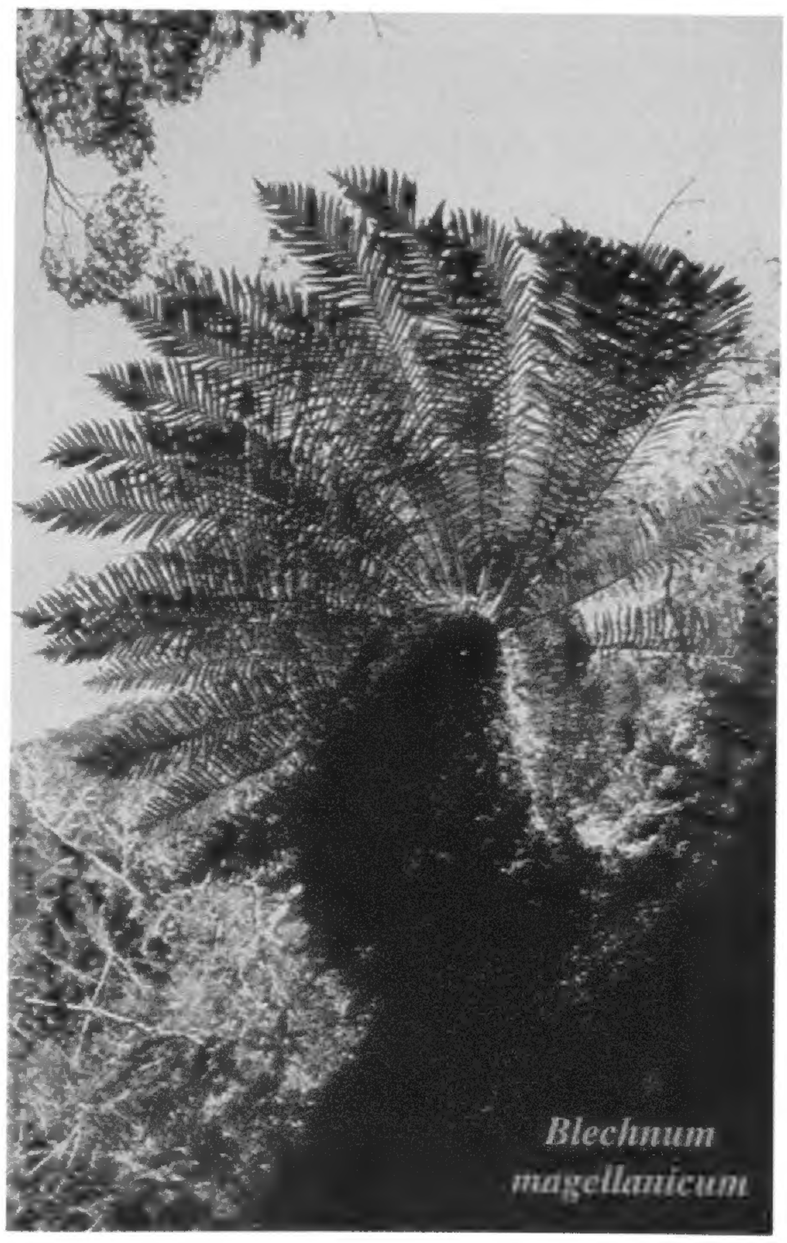
The latest excursion abroad of the BPS was this year's trip to Chile in February, which is towards the end of their summer. It was a fascinating experience, for Chile is so long and thin that it contains a wonderful variety of habitats. We travelled about a third of the country from Santiago down to Puerto Montt making forays into the National Parks and regions of interest. Chile is quite cut off from the rest of the world having desert in the north, ice to the south, ocean to the west and mountains to the east.

There appear to be two sorts of *Blechnum* in Chile: the ones which are dimorphic and those that aren't (dimorphic: like our *B. spicant*, the sori are borne on specially modified fronds). Of the latter sort we found *B. hastata* (which used to be *B. auriculatum*) and *B. arcuatum*. The first is quite common, about 1 to 2 ft. tall and has little 'ears' at the base of each pinna pointing both backwards and forwards. The second is very beautiful and has long fronds which hang down, often from the bank of a river or ditch. It looks a bit like a drooping *Nephrolepis* hanging out of a pot.

There are several small dimorphic Blechnums which creep about. We had trouble with these. It is very difficult working from a key in Spanish which poses impossible questions. One was "are the fertile fronds longer than the vegetative fronds?" - difficult when you don't have both types of frond! *Blechnum penna-marina* is common

but often does not look like the ones we grow in the U.K.

Then there were the big ones. We tried to work out the differences between *B. chilense* and *B. magellanicum* from the key. Were the escamas claras? Were the pinnae sessile, adnate or stalked? We needn't have bothered, when we found *B. magellanicum* it was so different from *B. chilense*, which we had found by every roadside, that you could tell them apart in the dark!



I fell in love with *B. magellanicum*, it is a most attractive fern. It looks like a cycad and grows a tuft of magnificent fronds from a fibrous trunk which can grow up to six feet so that it looks like a tree fern. The fronds are quite different from those of *B. chilense*, and I got a photograph of the two Blechnums growing together. The local name for *B. chilense* translates as "cow's ribs". When you look along a frond it can resemble a spine with ribs sticking out!

We went on a walk through the forest of *Fitzroya cupressoides* or alerce up in the mountains near Puerto Montt. Alerce is a slow growing coniferous tree which was named for Robert Fitzroy, captain of "The Beagle" (Darwin's voyage of 1831-6). It does not make much of a canopy. There was a limited flora beneath but the *B. magellanicum* grew in profusion. The path was very difficult with mud and tree roots and at one point we came to a stream where you had to step onto the crown of a *B. magellanicum* to get across. It seemed like sacrilege to trample on such a noble plant but there was no other way, so it helped me across. The trunk was about 18" tall and it held my weight which, as you know, is quite considerable, so I was most impressed!

From the Flora of Chile it appears that *B. tabulare* is an old name for *B. chilense*. It may belong to a South African fern now, I don't know. David Jones's *Encyclopaedia of Ferns* is not very helpful but his picture of *B. brasiliense* looks similar to *B. magellanicum*.

GROWING FERNS

GROWING FERNS IN DRY SHADE

A R Busby

One of the most often asked questions is: "Is it possible to grow ferns in dry shade?", a question to which I always give two answers. The short one is NO! but if they have time to listen, the answer is a qualified Yes!

To deal with this problem fully, we need to consider all the parameters that contribute to a dry shade situation. The term "dry shade" suggests a rain shadow. For some reason the normal rainfall is prevented from soaking the soil. The most likely reason is that the ground is over shadowed by the canopy of a large tree or the wall of a building. Trees providing dappled shade will permit the rain to penetrate the surrounding soil and such situations usually provide ideal conditions for cultivating shade-loving plants. Therefore, conditions must be quite severe to prevent the soil from being soaked by the rain. I often suspect that the dry shade complained about is really not too dry to establish some shade-loving plants.

To ensure that the site in question can be made suitable for the growing of ferns and other shade loving plants we need to understand the relationship between the plants' requirements and the type of shade and soil present.

A sandy free-draining soil will present more problems to solve than a heavier soil type. There are four soil water conditions that affect all plants.

1. **Field Capacity.** This is the total amount of water held in the soil despite the effect of gravity. This is the condition normally found in the early spring after winters snows and rain. This is not a state of waterlogging or soil saturation. It is all the soil water held by the capillary action of water surrounding the soil particles. Obviously more water will be retained in a minutely particulate clay soil compared with a more coarse grained sandy soil. A waterlogged soil has all the air pockets between particles filled with water, a condition only specialised plants can deal with. A truly healthy soil must consist of both air and moisture.

2. **Soil Moisture Deficit.** This is a measure of the loss of moisture from the soil which will occur because of evaporation from the soil and by the trees and plants absorbing moisture through their roots to be transpired from their leaves. Its extent will be governed by prolonged dry periods, high temperatures and the amount of foliage the soil is expected to support. Rainfall and/or a good watering regime will help to alleviate excessive moisture loss.

3. **Temporary Wilting Point.** This is a condition often experienced by plants during the hottest parts of the day when plants wilt due to their demand being greater than the amount of moisture available from the soil. This condition is alleviated in the coolest parts of the day such as evening and night. The plants' demand for water is reduced and they are able to recover from temporary wilting until the following day.

4. **Permanent Wilting Point.** This is the point where plants wilt even in the coolest parts of the day. I recall seeing mature beech trees in this condition during the 1996 drought. It is a condition that no garden plants should be allowed to reach.

The other major feature of a healthy soil is its organic content: "humus". Humus provides nutrients and acts as a reservoir for moisture whilst assisting with drainage. It also improves soil aeration and provides sustenance for micro-organisms which are so essential for recycling of nutrients.

Bearing all this in mind, let us now consider our dry shade area. What is the reason for the shade? Is it a building or a large tree ?

If it is a building, then there is not much we can do about it other than prepare the soil in such a way that moisture is retained over as long a period as possible. Even a very large tree will allow some moisture to reach the ground but the problem created by a tree's rain shadow is exacerbated by its demand for any available moisture *via* trees roots.

We should also consider what kind of soil are we dealing with. I suspect that if we are gardening on heavy clay, dry shade is a condition we are unlikely to meet with. I am fortunate to have a garden that is on very heavy clay and my ferns love it. In a dry period, it may set as hard as concrete, shrink and develop large fissures but it never dries out. A dry shade problem is largely found on soils that are sandy and free draining.

Any gardener can tell if they are gardening on heavy or light soils but a relatively simple test can be carried to tell us exactly what kind of soil we are dealing with.

A Simple Mechanical Soil Test

Method: Air dry the soil sample to be tested at room temperature. Fill screw-top jar with tap water and put about two tablespoons of the sample into the jar. Cover the opening, shake vigorously and allow the contents to settle for a few hours. Sandy soils will settle out more quickly than silty soils.

Now observe how the various components of the soil have settled out. On the bottom of the jar will be the heaviest material: stones and grits if present. Above that there will be a layer of sandy material, probably a different colour, then, above that, a layer of fine silty or clayey

particles. Finally (hopefully) you may find the organic components of the soil floating on the surface of the water. Observe these results carefully because you may well find more than three or four different strata. You will also be able to judge which stratum has the greatest volume.

Having considered the reasons for dry shade and the prevailing conditions that are adding to the problem, we are now in a position to eliminate them. So, prior to planting we must prepare the ground by incorporating as much organic material as we can. The best material is leaf mould, well rotted leaves, together with small quantities of 'twiggy' bits. Otherwise we can use the contents of a compost heap or any spent potting compost (we trust that BPS members are trying not to use peat-based composts these days - ed.). Avoid using any farm yard manure, stable manure (especially if the litter is woodchip rather than straw) and spent hops. All this should be forked well into the top six inches (15 cm) of the soil. Next, water the area thoroughly.

Remember my comments considering Field Capacity. This is the condition you should be striving for. Allow the soil to drain for a couple of days and then repeat the process. The soil should be well saturated so that it can achieve field capacity before planting is even considered. Then we can begin planting. I find that species and varieties of *Polypodium, Dryopteris* and *Polystichum* lend themselves to drier situations once they are established, but you should feel free to try other species and varieties.

When to do it? I suggest late February or early March. During the first season, regular watering during dry periods will be necessary and an annual mulching of well-rotted leaf mould should be applied around the ferns in late March. Ensure that the soil is well soaked before mulching. Once the ferns are established they should give little cause for concern. Watering and mulching in March should become an annual ritual and the initial effort will be rewarded with a fine border of ferns and associated plants.

FERNS IN MY GARDEN - Cysteropteris fragilis var. 'Alpina'?

Jack Bouckley

One of my favourite ferns, growing in my garden among limestone rocks, is *Cystopteris alpina*. David J. Tennant of North Yorkshire, a well known *Cystopteris* and Marsh Orchid expert collected my plant at an altitude of 5,500 ft near Seefeld, Austria. It is treated as a true species by Flora Europaea (1993).

This fern has been settled in its present position for five or six years and it is easily the very first of my collection to start growth each spring. This year the fronds were well established at the beginning of April, whilst many in my collection have only been showing for about a couple of weeks as I write this on 19th May 2002. Unfortunately it will also die back early, about three weeks before *C. dickieana*. This is a very rapid dieback, a sort of 'here today, gone tomorrow' affair. Apparently re-growth may occur the same year.

Stansfield (1929), describing the spores, wrote: "They are like little hedgehogs". Unfortunately I have not been able to view this, as my plant has not yet produced viable spores, which according to R.H. Roberts, average 49 microns in length. This is the largest mean of the *Cystopteris* spores in samples measured (Tennant 1995) but within the range of *C. fragilis*. It looks rather as though I could be lucky this year as there are signs of sori on a few of the fronds. The plant is much more delicate than the typical *C. fragilis* and *C. dickieana* and grows into a very tidy bun type of plant with fronds up to 7" in length.

It must be pointed out that all *C. fragilis* forms have echinate spores. *C. dickieana* has loose folds giving them a warty or rugose appearance. In June 1872 a certain Richard Potter who was employed by Backhouse's nursery in York collected a fern in the presence of James Backhouse jnr on Cronkley Fell in Upper Teesdale. Backhouse named it *C. alpina* Desv. In 1873 another Backhouse, his son William, collected more of these ferns. The Backhouse family made further collections in 1876 and then again in 1881. It is not certain that it has been found since although it was reported again much later. Definite details are not known, but it could have been about a hundred years ago. The herbarium specimens of these are at Edinburgh and at Kew. It is quite possible that Backhouse sold some of these ferns in his nursery so it could, therefore, still be in cultivation in some ferny garden.

My thanks to David Tennant for permitting me to 'borrow' some of his findings.

References

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GROWING FERNS

OPEN DAY ASKHAM BRYAN COLLEGE, YORK

Azu Fletcher

As part of my HND in Horticulture at Askham Bryan College in Yorkshire I was fortunate to receive a good grounding in micropropagation techniques from Lynne Grey who runs the laboratory there. In my final year, I had to choose a project for my dissertation and knowing that the college wanted to grow ferns, I decided to combine fern propagation with my knowledge of aseptic techniques. The only problem was that I had virtually no knowledge of ferns. I mentioned this to a friend of mine, Jonathan Wild and he said that he knew someone who might be willing to help me: Jack Bouckley. Jack very kindly agreed to let me interview him and so for me began an exciting education into the fascinating world of Pteridophytes. As the aim of my study was to develop an axenic fern propagation method that could be used with as many species of fern as possible, Jack was kind enough to let me have some spores to experiment with. He started me off with some fresh *Cheilanthes notholaenoides* spores. His initial cynicism about my method of propagation turned into curiosity when I managed to germinate the spores and in no time at all he was in the lab trying his hand at axenic culture, none too successfully I'm afraid, but keep trying Jack!

Jack introduced me to other members of the BPS via email and I was thus able to direct questions that arose during the study at various field experts. Clive Brotherton in particular was very generous with his advice. I am sure that my trays of little *Cheilanthes* would not otherwise have been as healthy. At the end of my study, the head of the science department at Askham, Dr Orton asked me if I would be willing to put on a fern display for the college Open Day. I approached Jack to see whether he

Young fern prothalli growing on agar in a tissue culture jar

would be interested as I was very aware that my own knowledge was limited. Jack of course responded with boundless energy and enthusiasm as well as a small proviso that he should be allowed to promote the BPS on the day! The Open Day exhibition was therefore a two-man show.

Jack's part was a magnificent display of different types of fern nearly all from his own collection (below).

It was arranged in such a way as to give visitors an understanding of the evolution of Pteridophytes. For that reason he also included horsetails, pillwort and a *Ginko* tree in the display. In addition, on the morning of the open day Jack had cut individual fronds from various specimens in his garden and these were displayed beautifully in boiling tubes. There was also a display of pressed fern fronds that demonstrated the lace like qualities of many fronds as well as a fertile *Osmunda* frond on white paper that quickly produced a thick mass of bright green spores. These displays obviously delighted the visitors and Jack was on hand to answer any questions, brimming with enthusiasm as always.

For my part, I demonstrated the aseptic technique developed at Kew Gardens by Ford and Fay in 1992 to clean spores and sow them onto an agar medium. Spores are placed in filter paper and then cleaned in a bleach solution, rinsed several times and then the filter packets are cut open and the spores are transferred onto the agar medium. The demonstration took place within a small, portable laminar-airflow cabinet, used to minimise contamination. Additionally, I had a display of the various steps of my axenic fern propagation method together with live samples of each of the stages: germinating spores, prothalli, sporophytes and mature fernlets. I also had on hand the two species of ferns that were mature enough at the end of my study to sell: *Cheilanthes notholaenoides* and *Dryopteris affinis*. In addition there were digital photographs of ferns in Jack's national collection mounted on a display board.

Both Jack and I really enjoyed the Open Day as our visitors were very enthusiastic. However, England were playing in the world cup on Saturday June 15th so our visitors were unfortunately fewer than we would have hoped.

My study received a Student Award from the International Plant Propagators Society whose motto is 'seek and share' and I received a year's free membership. I am also now a new member of the BPS partly because Jack exerted a little pressure (!) but mainly because I was impressed with the generosity and enthusiasm of the members I have been privileged to come into contact with during my fern study.

FERNS IN ART

THE LIDDERDALE FERN HUNT

Adrian Dyer

In 1992, Pavilion Books Ltd of London published a small book called "THE WINTER GARDEN, Penhaligon's scented treasury of winter verse and prose" by Sheila Pickles. Each selected passage of text was accompanied by a colour reproduction of a painting, and the end papers were impregnated with a *pot pourri* scent, also called "The Winter Garden", sold by Penhaligon's of Wellington Street, Covent Garden, London.

It was page 7 that caught my attention. Opposite an apparently unconnected essay about *pot pourri* for the winter season was a painting of a young girl in worn clothing against a country landscape in which the appearance of the vegetation suggests a date late in the year, perhaps October (Fig.1). On her back she is carrying a large wicker basket of fern fronds which resemble *Dryopteris filix-mas*. In one hand, she holds a ball of soil containing a small plant that is almost certainly a small specimen of *Phyllitis scolopendrium*. In the Acknowledgements in the back of the book, the painting was referred to as "The Fern Gatherer" by C.S. Lidderdale, courtesy of Phillips International Fine Art Auctioneers.

My immediate thought was curiosity about the story behind the painting. What was the significance of the fern gathering? Bracken was harvested in some parts of the country for a variety of purposes (Rymer, 1976) but the ferns in the painting are clearly not bracken. The artist was unknown to me, so I could only guess at the date as 19th Century but that made me wonder whether there was a message from the "Language of Flowers" popular at that time. Ferns were associated with sincerity, reinforcing the message of other flowers (Powell, 1977), but in this case there were no other flowers. I can find no particular message associated with *Dryopteris* or *Phyllitis*. Some fern species, including *Ophioglossum vulgatum* and *Osmunda regalis*, have their own folk-lore but I can find no myths attached to *Dryopteris* or *Phyllitis*. More likely perhaps is a pharmaceutical implication. Several ferns had a place alongside other wild plants in herbal medicine. Some, like the spleenworts, even gained their name from their supposed efficacy. *D. filix-mas*, amongst others, had long been used to expel intestinal worms (Leyel, 1974; Page, 1988) but the extract used was obtained from the rhizome rather than the fronds. It was also, like bracken, used as a source of potash for soap and glass production and, although a dual role as a vegetable and a vermifuge seems unlikely, apparently eaten at the crozier stage (Leyel, 1974). *P. scolopendrium* was popular as a remedy for healing burns, scalds, piles, and disorders of the bladder, liver and spleen (Leyel, 1974; Page, 1988). Maybe the basket in the painting contained rhizomes as well as fronds and the girl was employed to gather wild ferns for a herbalist, but would anyone other than another herbalist want a painting to commemorate the fact? More investigation was needed.

The Fern Gatherer by Charles Sillem Lidderdale (1831-1895), Phillips, The International Fine Art Auctioneer, UK/Bridgemen Art Library.

Although Lidderdale is not mentioned in several encyclopedias including Macmillan's comprehensive *Dictionary of Art*, searching in Art Libraries and Web sites has revealed a little about the artist. Charles Sillem Lidderdale RBA (born as a British subject in Russia in 1831; died 1895) was a genre artist who specialised in single figures, particularly pretty country girls, in landscapes (*see* www.victorian-paintings.com).

He exhibited from 1851 to 1893 at the Royal Academy and was elected to the Royal Society of British Artists in 1875. His addresses reveal that he lived in the same area of north London most if not all his working life (1864: 26 Beaufoy Terrace, Maida Vale; 1871: 18 Abbey Road, St. John's Wood; 1881 (census): 117 Abbey Road, St John's Wood; 1881, Alma Square, St. John's Wood). Beyond this, there was nothing that shed any light on "The Fern Gatherer".

Searching for his paintings proved to be no more revealing. Although the acknowledgement in Pickles' book implied that, at some time prior to 1992, Phillips Auctioneers of New Bond Street, London, had sold "The Fern Gatherer", they were unable to recall the painting and it was not possible to

trace the subsequent owner. I have not yet seen any Lidderdale paintings in galleries, and there is no mention of Lidderdale in the list of artists (www.tate.org.uk) whose works are represented in the Tate gallery (Tate Britain) in London. There is an illustration on the web-site www.victorian-paintings.com that shows another of his paintings (undated), called "Sara", of a girl in a hooded cloak against a landscape. Of particular interest is the face; she is almost certainly the same model as the girl with the basket of ferns.

What did emerge was that Lidderdale was not the only artist producing paintings of this type. Later in his career, the Pre-Raphaelite artist Sir John Everett Millais (1829-1896) produced a long series of popular paintings including "The Blind Girl" and "The Mistletoe Gatherer", a pretty young girl in front of a landscape and holding a large bundle of mistletoe on her back. William Powell Frith RA (1819-1909) painted a "Boulogne Flower Seller", showing a young country girl carrying a tray of flowers, this time with a town street in the background. In the caption to another of his works, "Dolly Varden" (mid-1840s) at Tate Britain, it is stated that the painting "..owes much to a strong nineteenth-century tradition of 'fancy portraits' - where likenesses of pretty and anonymous young women would be graced by the names of characters from literature".

Further progress in the search for the story behind "The Fern Gatherer" was the result of a visit to the library of the Victoria and Albert Museum, London. Here the catalogue revealed that the Museum had some of his original diaries, account books and notebooks relating to Lidderdale's work as an artist over the period from 1869 to 1890. A search through these revealed that he was a prolific artist. In the 1870's he was selling at least 20 or 30 paintings each year for up to £60 each (equivalent to over £1000 now) for the larger ones. The titles indicate the subject matter. In 1869 he painted "Girl with Pitcher" and "Keeper's Daughter" amongst others. In 1870 the titles included "Little Red Riding Hood", "Girl at Well", "Flower Girl", "French Fish Girl", "Italian Flower Girl", "Gleaner", "Shrimper", "Faggot Picker", and "Coming from the Spring". Later paintings included "Faggot Gatherer" (1874), "Wood Carrier" (1879), "Net Carrier" (1880, 1890), "Rush Gatherer" and "Mushroom Gatherer" (1881), "Haymaker (1889), "Hat Mender" (1890). Although he painted other subjects as well (e.g. "Exiled Jacobite" (1869), "Spanish Lady Praying" (1870), "Boy Bird Keeping", "Portrait of Miss F. Cobb" (1871), "Spanish Head" (1872) and "An Old Soldier" (1890)), clearly he had found a ready market for pictures of unnamed young girls, often employed in some rural occupation. Many of these subjects were painted several times. He appears to have sold eight paintings called "Wood Carrier" in one year, 1877, and others with the same title both before and after this date. More than once in his diaries he referred to these paintings as "pot boilers". On December 15, 1872, he wrote: "Got on with Spanish pot boiler and did a little to 'Kept in'." Some were painted to order for private clients, some offered for sale through an agent. On August 15, 1873, he sold the copyrights of "In disgrace" and "Little Red Riding Hood" to Tuck, presumably for reproduction as postcards. On May 1, 1875, he sold a Mr. L. Pocock a painting called "Forbidden Fruit", the subject of which we can only guess at. In all he must have sold several hundred paintings and it is perhaps surprising that it is not easy to find an example. Some will have been lost when Victorian paintings by the lesser artists were out of favour during the mid-twentieth century. Some will still be in private collections, others perhaps in provincial galleries. I would be interested to hear from anyone who knows where any of his paintings can be seen.

A comprehensive account of the entries in his diaries and notebooks would require more time than the one day I was able to spend on a visit to London, but that was enough to provide some background to his work as an artist, and it did yield some specific information about the painting of the girl with the ferns. In his diary entry for September 29, 1877 (Fig. 2), he writes: "Muirhead called in the aft[n] wanting a new "Carrier" with ferns this time, not wood. I laid one in, to be 38 x 29 as before, @ £45." Over the next four days he was busy working on "..Muirhead's new picture.." amongst others, and by October 27 it was delivered to Muirhead. His account book confirms that it was in oil, called "Ferncarrier" and that he received £45 on that date. However, the story doesn't end there. An entry in his notebook a few weeks later (November 21, 1877) states: "Ferncarrier, oil, 30 x 21 repeat of large do. [ditto] with many alterations to Mr. Muirhead. £30." and his diary entry for that date confirms: "Delivered small Ferncarrier to Mr. Muirhead - got his £30". The "Fern Carrier" title appears again in May, 1879. In his diary for May 19, he writes: "At basket carrier - decided to put ferns into it", and on May 22: "Finished Fern Carrier. Coopers sold it to Joseph Nathan for £11, £1 less than I had named for my lowest." His accounts for May 22 confirm this sale of "Fern Carrier 24 x 20". Two days later, according to his diary, he "Finished w. col. Fern Carrier & sent it to R's. Got £7." and his accounts for May 31 record the sale of "Fern Carrier w.col. 17 x 14" with another painting for £18.4s.6d".

So what does all this tell us about the mystery painting? First, its original title was probably "The Fern Carrier" not "The Fern Gatherer". There is no mention of the latter title in any of his records. In 1877 he had just finished eight repeats of the "Wood Carrier" and the first fern painting seems to have been a variant of this. Secondly, he painted four pictures with this title, three of which were in oils and the last a watercolour. The painting reproduced in the Penhaligon book appears to be in oils, and is thus presumably one of the first three versions. The book illustration includes the whole

picture recorded in the library photograph without significant cropping and the proportions (Width : Length ratio = 0.74) are closest to those of the first oil painting (ratio = 0.76). This would suggest that the mystery portrait was the one painted during October, 1877, rather than either of the later ones (ratios = 0.70, 0.83). This date matches the season portrayed in the picture although, as it was painted in his studio and the background at least was no doubt one he had painted often before, this may not be significant. Maybe the two later versions he painted in May (1879) looked the same. Thirdly, the choice of ferns as a subject had little or no significance, at least for the artist. He painted them, perhaps for the first time, in October 1877, at the request of his agent, Muirhead, and then repeated them because they sold.

Why did Muirhead make the request? Can we learn anything from the ferns in the picture? The ferns in the basket are carefully painted with the detail sufficiently accurate to make identification as *D. filix-mas*, or just possibly *D. affinis* (*sensu lato*), almost certain. Lidderdale must have worked in his studio from collected specimens or from studies made "in the field", at least for the first painting. The condition of the fronds, with the tips of some turning brown, would again be consistent with a date in October and of course the wintergreen *P. scolopendrium* would also have been available at that date. But why ferns, and why those ferns? The likely date of 1877 places this painting within the era of "Pteridomania" even if perhaps just past its peak. The British Pteridological Society had been formed only 6 years earlier. Heath's "The Fern World" was published in 1877, and several other books by the same author together with Britten's "European Ferns" were still to come over the subsequent eight years. Ferns were clearly still fashionable, and perhaps first Muirhead and then Lidderdale himself saw fern paintings as a way to expand his market. The choice of *D. filix-mas* and *P. scolopendrium* was perhaps determined by nothing more than convenience. Despite the rural setting of many of his paintings, I have come across nothing to suggest that during this period Lidderdale travelled far afield for his subjects, and these two species are likely to have been amongst the most common and the most conspicuous in north London parks and gardens, either planted or as self-sown volunteers. Both can be found colonising the mortar in walls of damp, shaded basement areas and gardens. In his diary for October 1, 1977, while he was working on the first "Fern Carrier" painting, he states that he "Went to Priory grounds at 3 and began a study of brambles etc. there.". There is a Priory Road leading off Abbey Road, where Lidderdale was living in the 1870s. This suggests that the Priory grounds he mentions were close to his home, that this was not the only time he had visited them, and that at least part of the grounds was neglected and overgrown. It is quite likely that the ferns he painted grew in the same grounds and were either painted *in situ* or brought back to the studio.

With the disappointing conclusion that the inclusion in the painting of two recognizable ferns probably had no pteridological significance to the artist or Muirhead who commissioned it, attention turns to two other people associated with the painting, the model and the purchaser. The model is almost certainly the same one as in the painting called "Sara" (though that may not be her real name), suggesting that he had at least one regular model, perhaps from among his household. If the painting is an accurate likeness (and the similarity between the two portraits suggests that it is), she would appear to be in her mid- to late-teens. A cursory examination of the diaries revealed that he was married and the household included someone called "Annie". Subsequent examination of the 1881 UKI census showed that his wife called Kezia was 39 years old and born in Whitchurch, Hampshire. Also in the household, in addition to two young sons (William K., 9 yrs and Robert H., 7 yrs), were his daughter, Anne E. (19 yrs); god-daughter Alberta E.H. Noyes (17 yrs); widowed cook, Susan Hayward (35 yrs from Norwood, Surrey); and housemaid Annie E. Aldridge (21 yrs from Broughton, Hampshire). Of these, Anne, who would have been about 15 yrs old at the time of the first fern painting, and Annie, who would have been about 17 yrs old, could perhaps have modelled for the painting. The fact that he mentions Annie in his diary perhaps suggests that she was more than just a housemaid. However, in his diary for May 26, 1879, just after he sold the third oil painting of the Fern Carrier, he records that he "Began new one of Hester". This implies that Hester was one of his models and that he had painted her before. Perhaps then she was the model for "Fern Carrier" and "Sara". Further detailed study of the diaries will be necessary to discover whether there is any other information about his models. Regarding the purchaser, the first two paintings were presumably sold on by Mr Muirhead to persons unknown. The third version of "The Fern Carrier" seems to have been bought by a Joseph Nathan. It would be nice to think that Mr Nathan or one of the unknown purchasers was a keen pteridologist, perhaps even a member of BPS, who wanted to decorate the interior of his house in a way that linked with the collection of ferns growing in his garden.

Incidentally, does anyone know where Lidderdale is? The artist's family name is rare in English records but features much more often in Scotland. Is it derived directly from a locality, or is it a corruption of some other name, like Liddesdale or Lauderdale?

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IDENTIFICATION

BRITISH MALE FERNS

James Merryweather

What should we do about *Dryopteris affinis?* Five editions of *Pteridologist* have passed since I, assisted by Adrian Dyer and Clive Jermy, mounted a campaign to rectify the male ferns predicament (*Pteridologist* 1996), but I'm afraid no boffins have stepped forward to give practical assistance to members of the BPS who desperately needed help with these critical taxa in their field studies. It could be said that Christopher Fraser-Jenkins added to the discussion in his emergency (unrefereed) contribution in the *Gazette* shortly after the three articles appeared in *Pteridologist*, but he didn't recognise the irony in Adrian's *crie de coeur* and failed to clarify, for the all important amateur, the subject in which he has unrivalled expertise. His suggestion that we should refer to his 300+ page book on the subject (a manuscript which, at the time, resided deep in the bowels of the NHM where it probably remains to this day) and papers published in German, Spanish and Indian journals, was hardly helpful.

As the scope of my enquiries grew wider, I became increasingly aware that I was toying with a potentially explosive topic. Although several were very helpful, one taxonomist, who telephoned, actually threatened to wreck my career if I continued to interfere with what he considered to be *his* group of ferns. Thereafter, I dared not write anything for publication, not out of fear from risible threats, but because it was clear the task was virtually impossible: devise a presentable and workable guide that others could use with a reasonable degree of success.

Instead of rushing to press, I spent a lot of time trying to ensure that I could, as far as possible using field characters, sort out the various male ferns myself, calling on the benevolent guidance of Clive Jermy from time to time. It was agony, but I gradually developed enough confidence to teach others how to tell them apart, but not yet in the full glare of public attention. Six years later, I am better informed about male ferns in Britain and much, much wiser about taxonomy and taxonomists.

D. oreades D. filix-mas
D. affinis D. borreri D. cambrensis

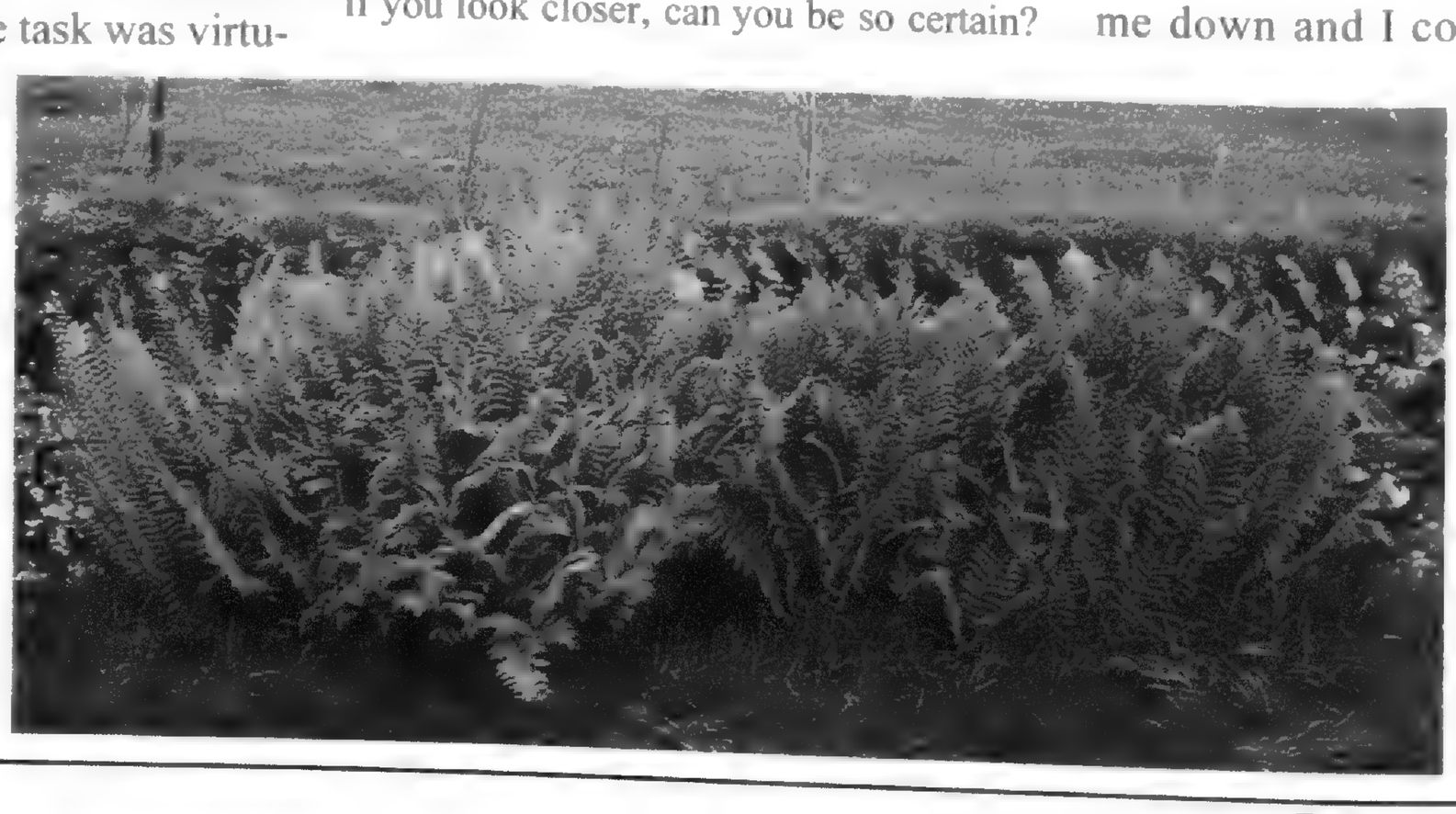
However, I'm still not a hundred percent confident when identifying the male ferns in the field. Is anybody, truly? Still, I think that now I can do them better than a lot of people, so I must persevere as well as share what I know with others. After all, male ferns, like the rest of natural history, belong to us all. They are certainly not exclusively my property!

I devised four ways of approaching male fern identification: 1. diagnostic features; 2. a key; 3. species descriptions; 4. a concise spreadsheet. I wrote a paper for *Field Studies*, but I never felt I had quite reached the stage where I could stick out my neck as "the expert" in print, so it was not submitted. Also, I felt that, although such aids to identification would reach a wide and worthy readership through that journal, it would pass by those I most wanted to help, the BPS membership, indeed the readers of *Pteridologist*. But how could I get away with such a bold and outrageous trespass into the territory of the taxonomists?

I have decided I must take courage and pursue my own, perhaps eccentric approach - you're welcome to ignore it. Most importantly, I will be brutally honest about my methods and the validity of my identification schemes. So, after several seasons spent head-scratching, I have relaunched the project whilst residing among the male ferns (bar one, *D. oreades*) on the Isle of Bute where, as I write, I can check specimens at first hand and encounter all the pitfalls for the umpteenth time in the field. That way I can transfer all reasonable cautions to the user.

A couple of years ago, whilst here showing the island's ferns to BPS groups from Cumbria and Edinburgh, I took a party to a place in the grounds of Mount Stuart Castle where I had previously found four distinct and identifiable male ferns literally side by side. This time, only a year later, when I needed them to co-operate for a critical audience, the same plants let me down and I could not state with confidence that some were unequivocally one or another species. After a lot of lively discussion, Adrian Dyer took me aside and quietly asked: "How can you sort these things out

Dryopteris cambrensis* & *D. filix-mas
The difference is obvious by *jizz* alone, but if you look closer, can you be so certain?



if you can only certainly identify thirty percent of them?" It was a horrible question, which I did not want to have to face, and I still instinctively reject it, knowing full well he was (almost) perfectly right!

I can't give up on this project. I truly can identify typical specimens of all of the male ferns (probably more than thirty percent of them too). It's all the atypical ones and atypically expressed characters that give me trouble. Still, thank goodness the dark spot male ferns only produce male organs (we are told). If they could freely interbreed, we'd likely have to contend with a perplexing confusion of apogamous backcrossing hybrids.

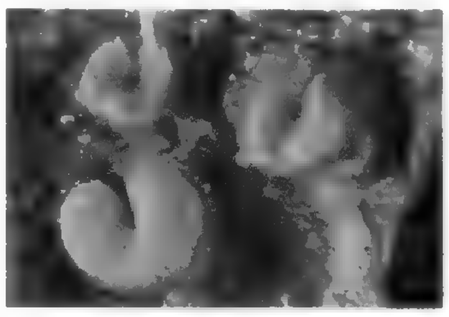
The problem is partly one of human nature and expectation. We are used to the British flora being more or less sorted out and presented to us in easy to use book form. Taxonomists lead us to believe that they can classify, name and identify organisms, but the honest ones have, and convey to us, their reservations. We, for our part, impose high expectations upon the taxonomists' classifications and demand a hundred percent success (assuming we use keys competently).

It will never be that simple with critical groups. Except *Homo sapiens*, all living organisms are blissfully unaware of our requirement to demonstrate relationships and differences between them, and they don't care whether or not they have a name: correct, inappropriate or interim. It is we who force them into artificial classifications so that we might understand what only humans need to know. Should we really expect keys always to work?

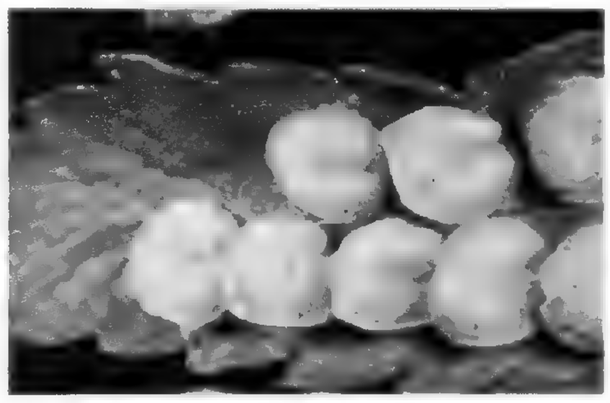
If only keys were designed to guarantee success to the user. They are often pretty useless because the compiler has ignored the fact that at certain times of the year vital characters may not be available (*see Alan Ogden's article*) or vital differences rely heavily on subjective characters. Most don't bother to make sure their keys work when used by real people. I'm talking about simple keys to straightforward groups of

'Typical' Male Fern Sori

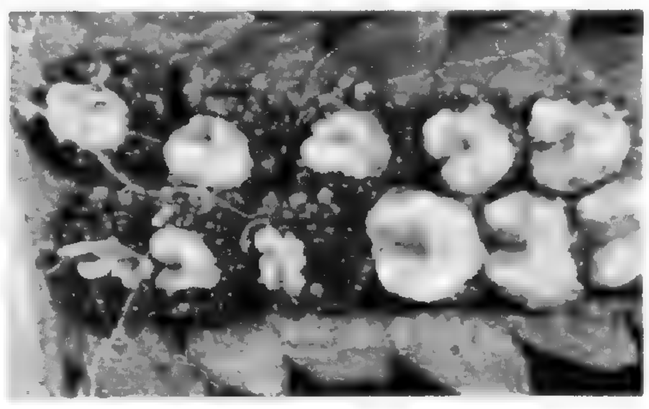
Some indusia, maybe many, but not all, will look like these.



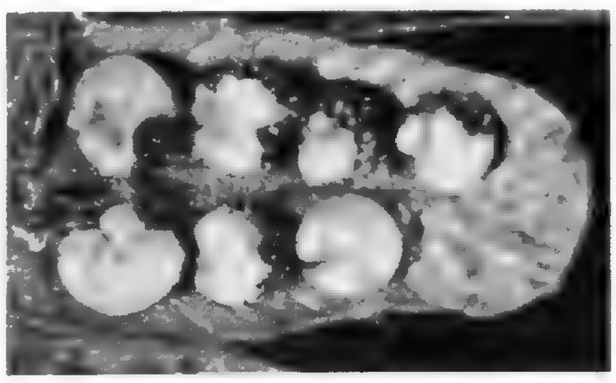
Dryopteris oreades
Thick with thin edge ('mob-cap'). Not splitting or shrivelling. Not shed.



Dryopteris filix-mas (early)
Thin, loose-edged & crowded.

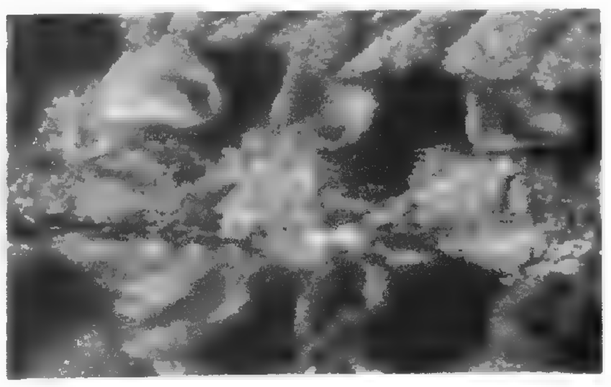


Dryopteris filix-mas (late)
Thin and shrivelling. Most shed.



Dryopteris affinis
Thick, tucked under, splitting. Not shed.

Dryopteris borreri
Thin, lifting & shrivelling ('chanterelle'). Most shed.



Dryopteris cambrensis
Thickish. Variously splitting, rising & shrivelling. Some shed.

organisms, but the male ferns are not straightforward. They are difficult, and a key may be designed with the greatest of care - I have devised one for male ferns - but, sorry, they can't be simplified and success should not be guaranteed in all circumstances no matter how hard I (or you) might try. Many plants will frustratingly remain unidentified in the field and laboratory confirmation will be the only alternative. However, if the limitations of field diagnosis are understood and aspirations kept within realistic limits, then satisfying if incomplete results are possible. Unfortunately we know too much about the male ferns to sit back and complacently lump them in the old way, and too little to be able to name every plant using field characters.

Therefore, please accept what I offer here and elsewhere with reasonable reservations and use these identification aids with caution and courage (referring, as I do, to Jermy & Camus' *Illustrated Field Guide*, *Affinis Watch*, Chris Page's *Ferns of Britain & Ireland* and *Welsh Ferns* for additional information). I hope it serves you a little better than what has come before and I trust that our corporate experience will lead us to understand better which male ferns grow where and why, as well as improve the identification process until we consider it to be at least satisfactory.

There are several distinct classifications for the male ferns other than *D. oreades* and *D. filix-mas*. Jermy & Camus described five *D. affinis* morphotypes in their book and others have decided there are nine, eleven or even more for our confusion. Britain certainly has more male fern species than I shall list below, but most of them are so rarely encountered they can be ignored by all but the specialists.

Recently, Clive Jermy told me that he has decided to consider three of his former 'morphotypes' of *D. affinis* distinct species (Fraser-Jenkins agrees but calls them sub-species). Out go 'Paleaceo-lobata' and 'Robusta' as mere varieties of, respectively, *D. af-*

finis and *D. borreri*, making the five British male ferns:

D. oreades, D. filix-mas, D. affinis, D. borreri* and *D. cambrensis

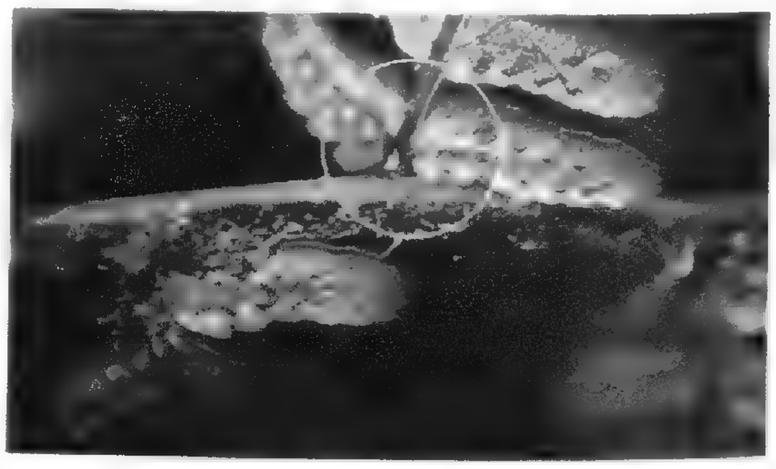
Since three of the male ferns are exclusively male and reproduce apogamously (or agamosporously) they flout the accepted definition of 'species' as do crosses with other male ferns flout the term 'hybrid', but we have to call them by those terms anyway. Thankfully, being devoid of female parts, *D. affinis, D. borreri* and *D. cambrensis* cannot (or should not be able to) interbreed and produce hybrids which, if they were to occur, would then reproduce asexually, and infest the countryside with all manner of character combinations to our utter confusion. However, apogamous hybrids can and do arise between each of them and the sexually adequate *D. oreades* and *D. filix-mas*, but fortunately, they do not seem to proliferate into populations, spread or beget significant backcross offspring. We are indeed fortunate that male fern taxonomy is not complicated any more than it is already by additional breeding complexities!

I have found Clive's three new species to be a reasonable scheme when looking at male ferns in many parts of Britain, but among the individuals that present problems are the few which do not conform to any description. I don't mean those of intermediate form, which perhaps illustrate variation or may be hybrids (of which, fortunately, only a limited number is possible). I mean different ones that don't match the descriptions of the five or their varieties as understood at present. I discovered a colony of such a puzzling fern at the end of a long day's hunting with Jack Bouckley near Ripon, North Yorks. We had just to pass it by for the time being, promising to return one day and confront the problem. Fortunately, such 'uncomfortable' male ferns are not common, but their identities will have to be examined one day. Those dealt with here are the common ones found throughout Britain.

Rather than publish and risk the wrath of a few nervous taxonomists, and so as not to use up too many pages of this issue, I have decided to offer you my identification guides to readers on application. Many of those interested will, I hope, contact me by e-mail to request an illustrated guide to be sent as attachments. I have used the PC versions of Microsoft WORD 6 and EXCEL 5 but I can probably save as MAC files if you specify. If you don't do computers, please send me a full size A4 addressed envelope and fiver, and you can have it all on paper. My contact details are inside the back cover including a change of address to occur in mid or late January.

I'm afraid everybody will find the text terribly verbose. It has to be, for I can find no way of condensing so much essential detail further, but perhaps, when, as Chris Page puts it, the user can apply *the full symphony of characters* of each male fern to the unknown from memory, then the spreadsheet might be all that is needed, eventually. You will receive warnings, but I'll say it again: In all keys, including my own, please use *subjective characters* with great care because they only work when you have: a) other plants to compare with and b) adequate experience to appreciate them in the absence of comparators.

Finally, I have discovered that the dark spot, always given as the easy way of telling *D. filix-mas* and *D. oreades* from the rest, does not always work! A wise participant on one of my recent Field Studies Council courses observed that it is probably better to consider: "If the dark spot is absent, then you probably have *D. filix-mas* or *D. oreades*, and go from there". Absence is a poor character, but I will be experimenting with this idea as I refine the trickiest of my identification guides, the dichotomous key.



Dryopteris filix-mas
with dark spots!

Polypodium cambricum

FIELD IDENTIFICATION of POLYPODIES

James Merryweather

There are three species of *Polypodium* in Britain: *P. cambricum* (previously known as *P. australe*), *P. vulgare* and, the result of their hybridisation in ancient times, *P. interjectum*.

Despite having been warned long ago that field identification of these ferns was not easy, I always reckoned myself competent enough, but realised the arrogance of this presumption last summer. Part of the problem is living in the north of the country where *P. vulgare* is the most frequently encountered polypody, the other two being really rather ➔

Polypodium vulgare

➔ uncommon. Even so, I somehow managed to find *P. interjectum* where ever I went. Recently, using microscopes to count the cells which attach the sporangium to its stalk and the indurated (thick walled) ones in its annulus, I discovered my folly.

A tree near Lawrenny, Pembrokeshire has both *P. vulgare* and *P. cambricum* on its trunk (cover picture), I felt confident that my diagnoses were correct, although it was too early in the season to collect usable sporangia for laboratory confirmation. Still, when two polypodies grow side by side it does seem to be easy to recognise the differences. During my "Ferns of North Wales" course in late August 2002, and at 40 m.p.h., I sighted *P. vulgare* and *P. interjectum* growing together in an Anglesey hedge bank. The difference seemed so obvious we were convinced that from then onwards field identification would be easy.

We collected polypodies wherever we went that week, and on the last evening, put them all through rigorous microscopical examination. Almost every specimen for which we had decent sporangia was *P. vulgare* with a single basal cell and 10-13 indurated cells in the annulus. That included many of the "interjectums" we had collected except, to our relief, the Anglesey example, which came through the process with flying colours: 2 or 3 basal cells and around 9 indurated cells.

Then we investigated a plant growing on steps behind the field centre (Field Studies Council, Rhyd-y-Creuau), which has broadly triangular fronds with slightly serrated pinnae, the bottom pair inflexed and oval sori, highly characteristic of *P. cambricum*. One thing puzzled me. Most fronds had aborted sporangia, suggesting hybridity, perhaps between *P. cambricum* and *P. vulgare*, but two fronds paradoxically had good sporangia. The result of our study revealed that it was - confirmed by the high number of annulus cells and single basal cell, as well as the lack of paraphyses (sterile hairs) among the sporangia - *Polypodium vulgare*!

I remain perplexed, and much less willing than formerly to identify polypodies on field characters alone. This is particularly frustrating when, for much of the summer there are no mature sporangia, though old fronds sometimes provide the necessary microscope fodder.

P.S. Another lesson learnt was not to expect *P. vulgare* to have circular sori. Certainly they are usually much less oval than on *P. interjectum* and *P. cambricum*, but don't expect them to be circular, rather think of them as "round".

INSECT ATTACK ON LADY FERNS

Mike G Taylor

I moved to the Isle of Skye from Bedfordshire in February 2001 and I am now thoroughly enjoying my retirement studying the many different species of fern to be found on there. In early June I was examining some lady ferns growing alongside the Obbe (a salt marsh) and noticed that the tips of some of the fronds were curled over into a tight knot; further examination showed that there was a white larva approximately 2-3 mm long inside each one. I sent some of the larvae to Mr Nigel Wyatt, Curator (Diptera), Department of Entomology at The Natural History Museum and received the following reply.

"The grubs that you found on lady ferns are the larvae of a fly, *Acrostilpna latipennis* (family Anthomyiidae) which is widespread in Britain but rather uncommon and local. The larvae mine the leaves and stems of the fern, which can cause the tip of the frond to roll over. As far as I know, this species has only been recorded from *Athyrium filix-femina*, although that does not necessarily mean that they cannot occur on other ferns. The adult fly resembles a rather slender, dark grey housefly. Another group of Anthomyiidae, the genus *Chirosia,* also has larvae that attack ferns in a similar way".

I have since found that the majority of the lady ferns in the area showed signs of being attacked to a greater or lesser extent and I have also found a similar infestation on one plant of *D. filix-mas* that was growing among several lady ferns.

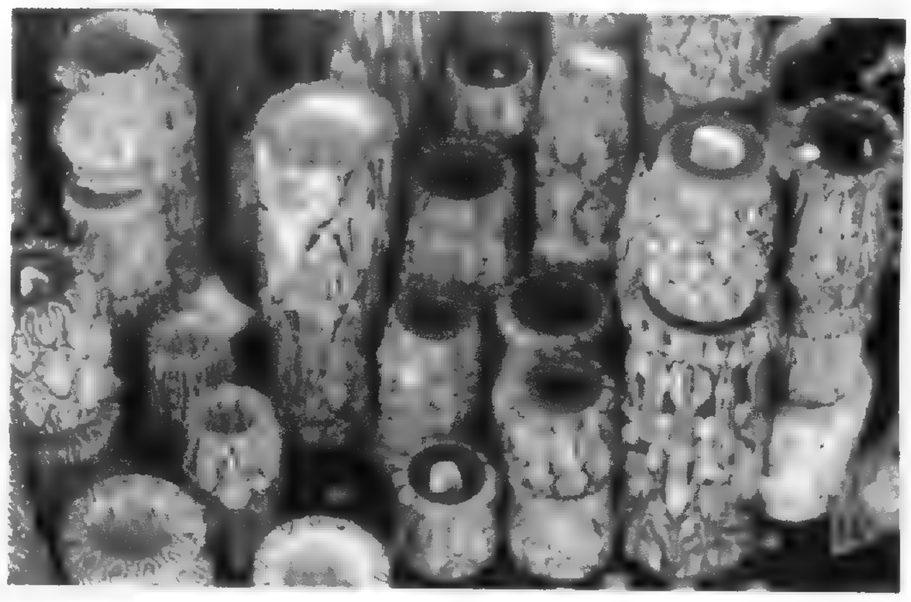
Tree-Fern Newsletter No. 8

Edited by Alastair C. Wardlaw
Convenor of BPS Tree-Fern Special Interest Group

Note: It is intended that this section will be a regular feature in *Pteridologist* and will replace the Tree-Fern Newsletters previously produced in small numbers on a home printer and issued annually to members of the Tree-Fern Special Interest Group.

The previous 7 Newsletters will be made available at nominal charge to those who would like copies. Articles and illustrations for the Newsletter should be sent to the convenor, as before.

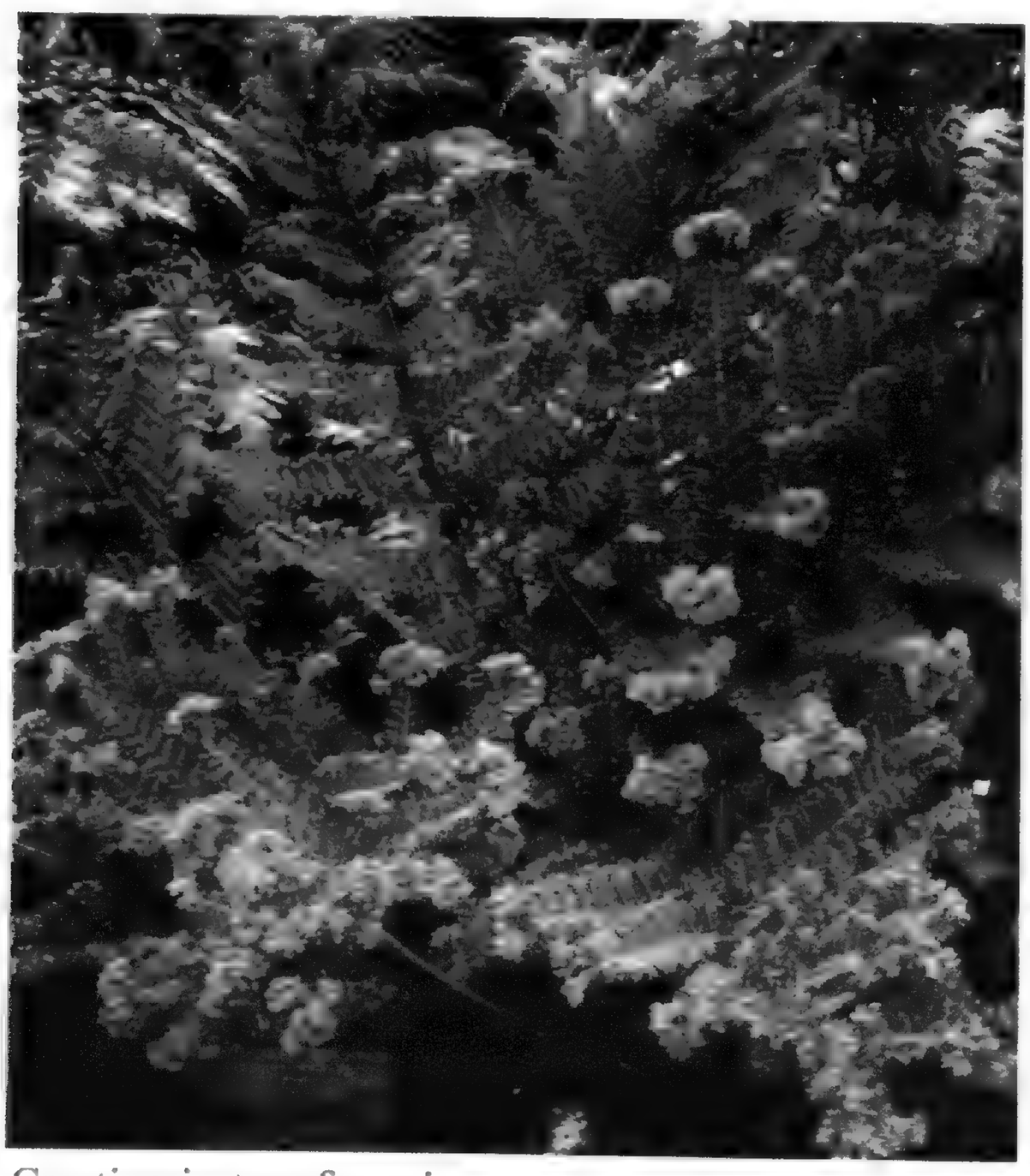
Future Tree-Fern Group activities will include a census of the tree ferns in cultivation by members of the Group and meetings dedicated to tree ferns within the regular programme of Society indoor events. Suggestions for other Group activities and news items are always welcome. ACW.



Jars and pots made from tree-fern trunks and offered as souvenirs in New Zealand.

A crested tree fern!

This crested variant of *Cyathea cooperi* was seen in February 2000 at the commercial fern nursery of Chris Goudie near to the town of Lara, about an hour's drive southwest of Melbourne, Australia. It was one of two different crested variants he had of this species. Neither had a trunk or was for sale.



Cresting in tree ferns is very uncommon and I am not aware of crested variants of any other species, such as *Dicksonia antarctica*. Chris has a very large collection of tree ferns, as described and illustrated by Martin Rickard in *Pteridologist* **3:** 37-41, 1998. ACW.

How many species of tree fern are there and how many are threatened?

According to the 1997 *IUCN Red List of Threatened Plants*, there are 623 species in the Cyatheaceae and 41 in the Dicksoniaceae. Of these, 202 species of Cyathea, or 32%, are under threat (to some degree) of extinction, as are 4 species in the Dicksoniaceae. Very few of the threatened species are available commercially or ever appear on the BPS Spore Exchange list.

Meanwhile there was a lot of media publicity earlier this year (e.g. *The Times*, 18 February, 2002) after a disturbing report from the World Wildlife Fund. This focused on *D. antarctica*, which is not an IUCN Red List species, and raised concern about the large numbers being imported into the UK to meet the demand from gardeners. The *Times* article used strong language like 'abusive plundering of the rainforests' of Australia and New Zealand (Note: *D. antarctica* is not a native species in NZ and therefore difficult to plunder there!). In rebuttal, at least one exporter argues that the tree-fern supply trade is a salvage operation, as the trunks are normally trashed during the commercial, clearcut logging of pines and eucalypts, with the tree ferns in the understory. Thus the rescue of tree ferns is a virtuous activity that just happens to be profitable. Who is right? Are we not being presumptuous in trying to lecture the Australians and New Zealanders on how they should look after their own natural resources? ACW.

Cyathea smithii outdoors in a Dutch garden

Mattan Schout, Pr. Beatrixstraat 17, 4311 BT Bruinisse, The Netherlands.

Choice: After successfully growing *Dicksonia antarctica* and *D. fibrosa* in my garden, I wanted to try a *Cyathea*. My first thought was either *C. smithii* or *C. australis*, but I think the former is more beautiful and it also remains largely untested in Europe. For example, it is not among the 6 *Cyathea* species described in the *European Garden Flora* (1986). Its potential hardiness is suggested by its being the most southerly-growing of any tree fern species, and also the dominant tree fern at higher altitudes in New Zealand.

The plant I bought in March 2000 had a stout trunk 70 cm high, with 20 old fronds and 9 new ones in various states of uncurling. The excellent condition of the old fronds suggested it had spent the winter in the glasshouse of the importer, so it should have been well established. Furthermore I asked the nursery owner to take it out of its pot to check that it had a good root system since I wanted to be absolutely sure of getting a good plant.

Planting: Next day I dug a hole about 40 cm deep and wide, added gravel for drainage and then a thin layer of peat. The fern was planted, together with more peat mixed with a small amount of the original heavy clay soil and some Osmocote. It was given a good watering and thereafter the trunk was watered daily, and the soil occasionally, until September.

The site was perhaps one of the keys to success. On the north was a two-metre high privet hedge, on the east a greenhouse, and to the south and west were sheds. Thus the fern was protected from wind and got sun only in late afternoon and early evening, in midsummer from about 4 p.m. Frond production continued until there were 39 at the end of September; so this fern was really quick growing. When one frond was almost developed another crozier was already well above the crown.

Winter frosts: In the winter of 2000/2001 there were 26 frosts, of which 20 were only short-lived, just below freezing and occurring in early morning. The coldest period was from 15-20 January. On the 15th, the temperature was -6°C, and on the following days and nights -5°C, -7°C, -7°C, -5°C and -3°C. Measurements were with a min/max thermometer at the base of the trunk. When the fern was wrapped with insulation, the temperature was that at the base, but outside the insulation.

The plant also had to deal with snow at the end of February when the temperature was just around 0°C, but I decided not to protect it.

Snow on *Cyathea smithii* in late February

Insulation: The ground around the base of the trunk was mulched to a depth of 20cm. During the short period of freezing in January, the fern was protected by tying the fronds together vertically and enclosing the whole plant in a cylinder of wire mesh, tall enough for almost complete coverage. The space was filled with a mixture of dry oak and beech leaves to give a 25 cm thickness around the trunk and continuing to about 20 cm above the apex. The cylinder was then encased in bubblewrap, so that only the tips of the fronds were protruding. Leaf litter was tucked inbetween the stipe bases and above the apex, but it was very difficult to get it into the crown. Unlike *D. antarctica*, in which next year's croziers are clearly visible in winter, the apex of *C. smithii* is hidden by the stipes, which bend themselves in an onion-like shape until they touch each other above the growing point. Is this perhaps an adaptation of the plant to protect its growing point from the cold?

Top: *Cyathea smithii* in its sheltered location. Below: close-up of trunk and showing the denuded rachises starting to form the characteristic skirt.

After 20th January, the insulation was removed except for the ground mulch. The same protection was re-installed

for a single night in mid-February when -3°C was forecast, but it was removed the next day.

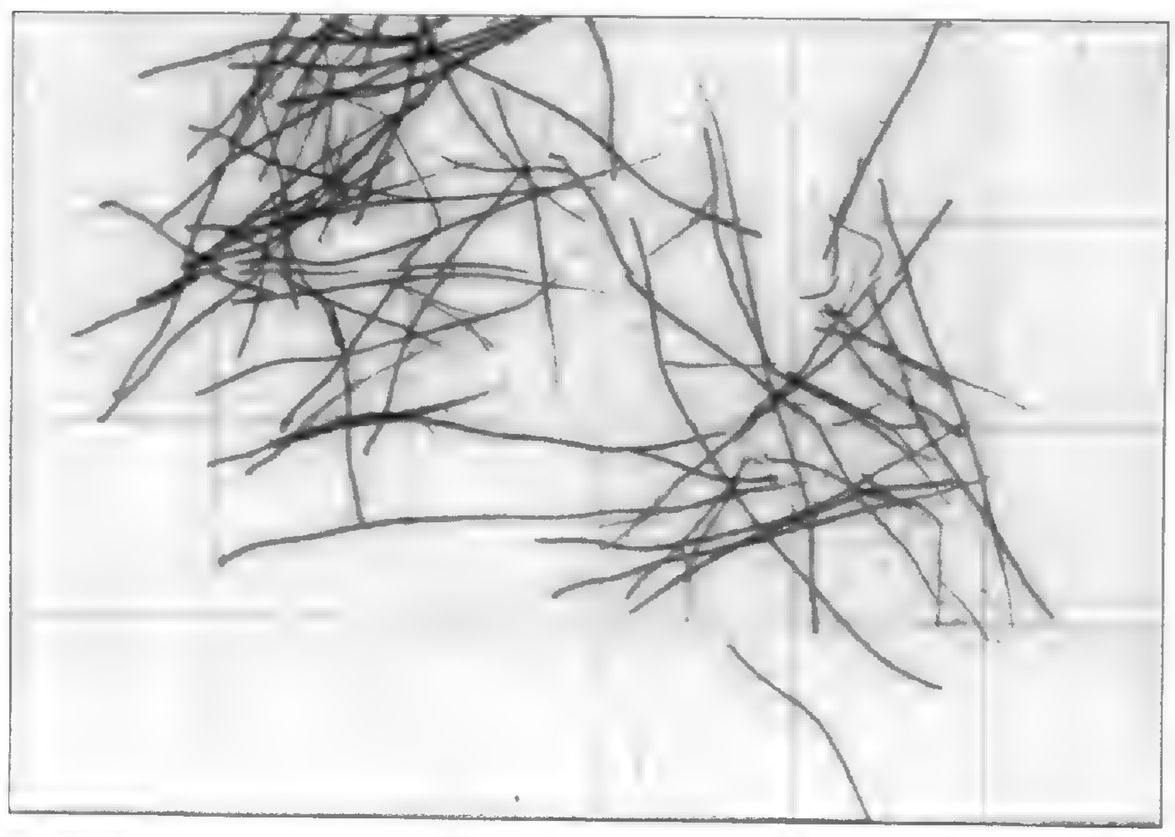
Results: The fronds were only slightly damaged at the tips and also at the pinna tips. They had changed from bright green in summer to yellow-green in winter and did not collapse but remained stiff. They had some black spots, but whether this was due to the frost or because of sweating under the bubblewrap is not known.

In early April the first crozier appeared, soon followed by several others. By September, there were 30 fronds, which were larger and a deeper light green than previously. Halfway through the summer of 2001 the fronds of the previous year had all withered to form the skirt that is so characteristic for this species. The lowest dead fronds were eventually left as naked stipes and rachises without pinnules, forming a dead crown under the living frond canopy.

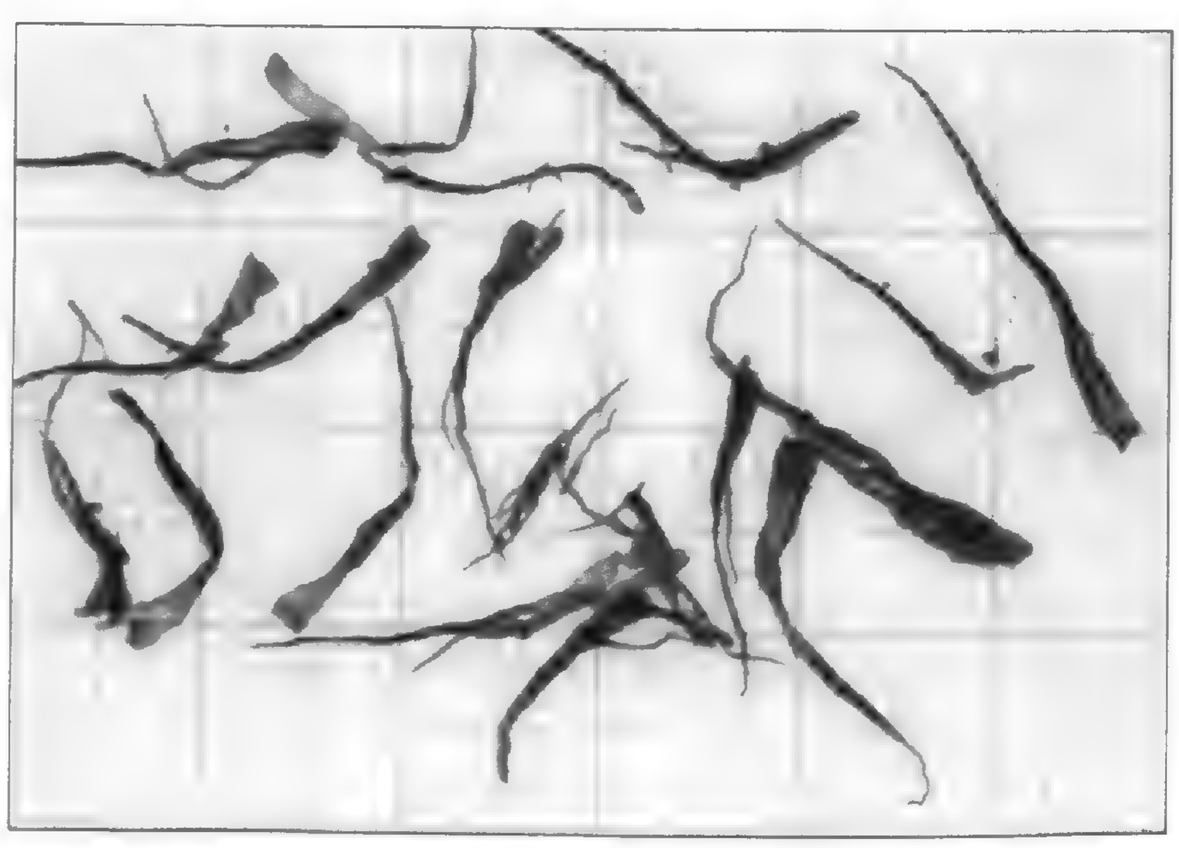
In the first season I did not notice much aerial root growth. Because *C. smithii* has such a fibrous trunk I would not have expected more than a few very small roots just above ground level. By September, however, many live roots were visible particularly from ground level to about 20 cm upward on the trunk.

Hairs and scales on tree fern stipes

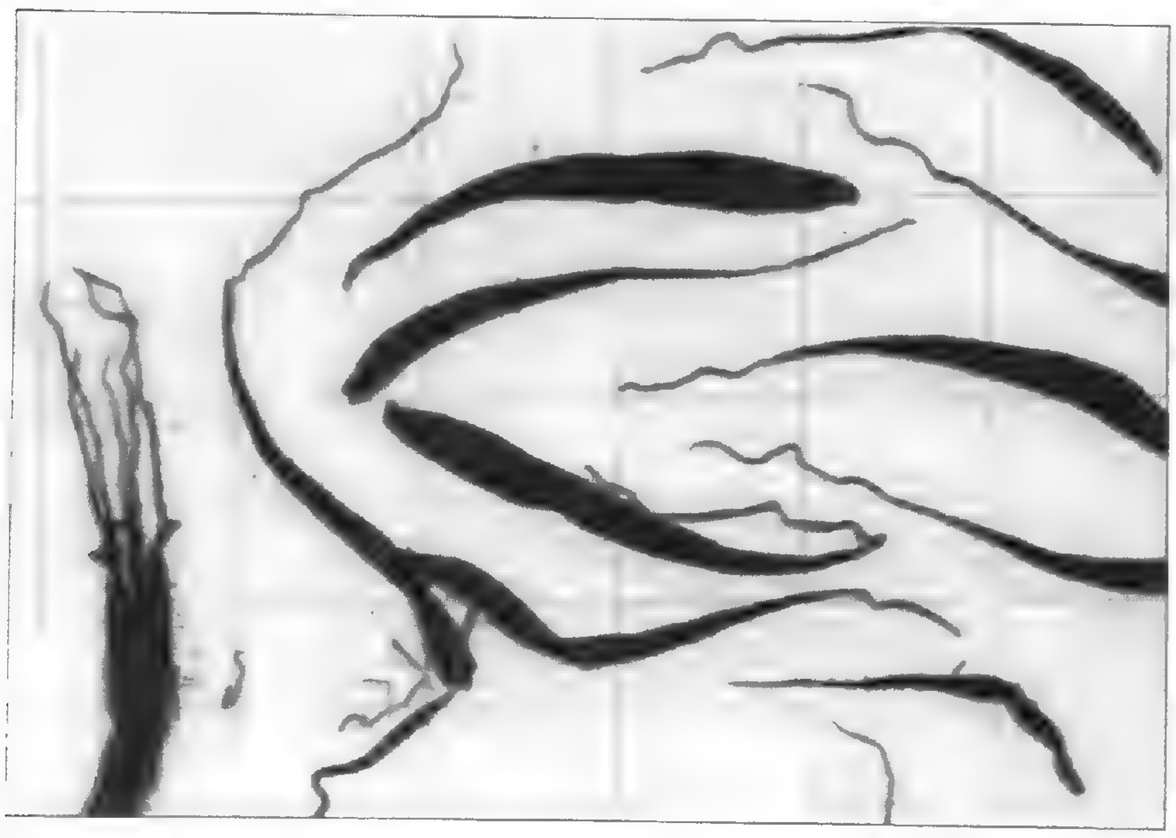
The hairs and scales on tree fern stipes, rachises and fronds are important taxonomic characters. On the stipes, Dicksonia species have hairs only, while Cyathea species have scales plus much smaller hairs. Both hairs and scales have to be inspected at least with a hand lens and preferably x20. A simple method of examination is to sprinkle a sample onto 5 cm-wide transparent sticky tape, which is pressed against centimetre graph paper, to provide support, a ruler and a permanently sealed preparation.



Hairs of *Dicksonia antarctica*



Scales of *Cyathea cooperi*



Scales of *Cyathea smithii*

Scales of *Cyathea australis*

Further winter-protection experiments with Cyathea australis

Alastair Wardlaw, 92 Drymen Road, Bearsden, Glasgow, Scotland, UK.

Background: This report describes my fifth winter of experimenting with different methods of insulating a well-trunked specimen of *Cyathea australis*, acquired in the summer of 1997 and planted outside in my Glasgow garden. Having seen this species growing in fairly open places in south-east Australia, I concluded it could probably withstand more exposure to sun, wind and desiccation than *Dicksonia antarctica*. I therefore thought I could risk planting it as a lawn specimen, and enjoy the architectural feature thereby created.

Winter protection: In the first winter, 1997-8, the trunk was wrapped in aluminium foil and bubblewrap, with fleece in the crown, and the whole plant covered with a transparent ridge-tent of sealed polythene, large enough to crawl into for periodic inspections (Tree-Fern Newsletter No. 5). Min/max electric thermometers were used to record the temperatures: a) in the garden; b) within the air space of the tent (i.e. frond temperatures); and c) within the apical cleft of the tree fern under the insulation at the top of the trunk. In brief, the fronds stayed green during the winter and the plant grew well next season. The minimum temperatures were (in mid-February) -7.5°C in the garden, -4°C in the tent and -1°C within the apical cleft. The protection was removed in late February, when the tent started to overheat on sunny days and the croziers began to uncurl.

Different methods were used in subsequent winters, but all led either to the fronds being mechanically damaged when gathered up into a vertical bundle, or withering if left exposed to the elements. In all cases the trunk and apex were wrapped to prevent the latter experiencing temperatures below -1°C.

Polyurethane box and PVC cover: In the first two years, trunk insulation was provided by aluminium foil (on the heat-reflection principle of the thermos flask) and bubblewrap. Subsequently I used a hexagonal box, made from 3 cm polyurethane foam, as available in the building trade. Within the box, the trunk had been wrapped with aluminium foil as before. The fronds were then gathered into a vertical bumdle (which damaged them) and covered with a tube of bubblewrap. The fronds stayed partly green.

Last winter (2001-2) I decided to explore another strategy. As shown in the picture, the trunk was covered with the hexagonal box and then the whole plant covered with a flat panel of corrugated PVC, supported on angle-iron 'goal-posts'. These were held in place with guy ropes, against gales. The idea of the PVC was to a) avoid mechanical damage to the fronds, which was unavoidable if they were gathered up and wrapped; b) protect the apex from saturation by winter rain; c) allow photosynthesis through the transparent plastic; and d) give the fronds some protection against radiative frosts on very cold and clear nights. As in the previous years, an electric thermometer probe was wired into the apical cleft under the insulation, and weekly min/max temperatures were recorded there and 1 metre above ground level under the canopy. With hindsight I should have had ready a very large plastic sheet to throw over the whole structure to give additional protection to the fronds on the relatively few occasions of hard frost on clear nights. It was these few, but heavy frosts, that withered the fronds in early January.

The garden minimum temperature (under the PVC canopy) last season was -6.4°C and the minimum within the apical cleft was +0°C. Croziers started to appear in early March, after which the trunk insulation was removed, but the canopy was kept in place until late April. The plant grew well in 2002.

Conclusions: In south-east Australia. *C. australis* is regarded as 'a very cold-hardy species' and grows at altitudes of up to 1200 metres in the State of Victoria, where there are frosts at that elevation. Previous specimens in my garden, left (optimistically!) outside without protection simply did not survive the winter. Whether this was due to frost, or frost in conjunction with rain, or other factors, is speculation. It may be that the much warmer summer in Australia allows more vigorous growth and better preparation of the tissues against winter insults. Be that as it may, it has given me a lot of pleasure and satisfaction to have a *C. australis* as a lawn specimen in Glasgow, but I am convinced it *does* need winter protection. I plan in future years to repeat the arrangement described above, but with the additional provision of a large plastic sheet to throw over the whole structure for the usually short periods, generally after the New Year, when the temperature drops below about -3°C.

THE BPS SPORE EXCHANGE

THE BPS SPORE EXCHANGE 30 YEARS ON

Alastair C. Wardlaw, Anne Wright & Barry Wright

The BPS *Spore Exchange* is now 30 years old. It was started by David Russell in 1972 and continued shortly afterwards by Richard Cartwright until 1987. He, in turn, gave way to Margaret Nimmo-Smith who ran the Exchange until 1997, when two of us (AW & BW) took over. The present report emerged as a three-way effort in which databases of the spores offered, requested and supplied to members in 2001, were prepared at the BPS *Spore Exchange* and sent to ACW for analysis. At a draft stage the text was shown to Margaret Nimmo-Smith and Martin Rickard, and we are grateful for their comments, some of which are presented thus **[bold in square brackets after their intitials]**.

Twelve years ago, Margaret Nimmo-Smith (1990) wrote:

- The title *Spore Exchange* is misleading.
- In practice it is a *spore distribution service*. The spores are donated by about 30 different people but over 100 people request spores.
- About 15 British members contribute regularly.
- Additionally, spores are received from half a dozen European botanic gardens (none British) and from overseas members living in Europe, America, South Africa and Australia.
- Four years later (1994) she observed:
- Primarily the Exchange is used by horticulturists, both in this country and abroad, who wish to extend the range of ferns they grow.
- The amateur grower can make an important contribution to the conservation of the wealth and diversity of plants grown in our gardens.
- In recent years there has been an upsurge of interest in growing foreign hardy ferns, and the spore list has given fern growers the opportunity to raise sufficient ferns to experiment with their hardiness out of doors.
- Members are often shy of trying new or unknown taxa, missing the opportunity to extend the number of ferns in cultivation.

We believe that most of these comments are still valid today and that it would be timely to comment on the patterns of availability and requests for spores from the list issued in 2001. It must be emphasised that the spores are received largely from amateurs who on occasion may send in wrongly named species or cultivars. Therefore the names cannot be guaranteed correct in the same way that we might expect from an *Index Seminum* sent out by a botanic garden. The BPS *Spore Exchange* attempts to correct odd spellings of taxa that are familiar to us and we pursue with the donors any odd genus/species epithets like *Oreopteris oreades* (actually *Oreopteris limbosperma* based on microscopy of the spores). However, any names not found in standard reference books just go in 'as is'.

The Two Dozen Most-Popular Taxa

Of the 571 taxa on the *BPS Spore Exchange List* 2001, requests were received for 528 of them (92%), leaving a residue of 43 (Appendix Table 5) that apparently nobody wanted, at least not in that year. Table 1 lists in rank order the 24 taxa for which the largest number of requests was received. In a few instances there was a major gap between spore requests and spore availability. The worst manifestation of this was with *Dryopteris fragrans*, where of the 22 requests, there were only enough donated spores to meet two of them.

- *Cheilanthes argentea* and *Woodwardia unigemmata* were jointly the most popular species of the 571 on the list, with 25 BPS members requesting each of them. The former is an eastern-Asiatic, limestone species, for hardiness zones 5 to 7. It would be interesting to know how or why it came to the top of the 19 *Cheilanthes* species in the spore list. **[MN-S: probably the best known?]** *W. unigemmata* is a Himalayan species requiring glasshouse protection, except in favoured areas. Another member of

Table 1. The two dozen most-popular taxa on the BPS *Spore Exchange List*, 2001, with their **commercial availability** and garden-worthiness (AGM). The numbers in brackets are: Number of spore Requests filled/Number of requests received.

Cheilanthes argentea (25/25)	***Adiantum venustum*** (15/15) AGM
Woodwardia unigemmata (18/25)	***Cryptogramma crispa*** (15/15)
Woodwardia areolata (23/23)	*Polystichum drepanum* (15/15)
Dryopteris fragrans (2/22)	***Dryopteris aemula*** (14/14)
Woodsia alpina (12/21)	***Gymnocarpium oyamense*** (13/14)
Woodsia ilvensis (15/21)	***Pellaea atropurpurea*** (14/14)
Blechnum chilense (18/19) AGM	*Blechnum fluviatile* (13/13)
Woodwardia fimbriata (19/19)	*Dicksonia lanata* (trunked form) (13/13)
Asplenium ceterach (18/18)	***Dicksonia sellowiana*** (13/13)
Blechnum discolor (13/17)	***Hypolepis millefolium*** (13/13)
Polystichum lonchitis (16/16)	*Ophioglossum pendulum* (13/13)
Todea barbara (16/16)	***Polypodium scouleri*** (13/13)

AGM = Royal Horticultural Society **Award of Garden Merit** Taxa in ***Bold*** type were available commercially as already-grown plants (according to the RHS *Plantfinder 2000-2001*), but see the comments on the meaning of 'commercial' by MN-S and MR in the text.

this genus, *W. areolata*, was third in popularity, while *W. fimbriata* was seventh equal, with 19 requests.

❧ A majority (18) of the top 24 are not native British species – confirming the well-known strong interest in growing foreign ferns, and noting that not all 18 are necessarily hardy in most parts of the UK.

❧ Two rarities in the native British flora, *W. alpina* and *W. ilvensis* were in the top 24, being fourth-equal with 21 requests, of which only 12 and 15 respectively could be filled. These shortfalls illustrate a general experience at the BPS *Spore Exchange* down the years when there has rarely been enough spores to meet the demand, especially for *W. alpina*. Another rare British alpine, *Cystopteris montana*, has not been on the spore list in recent memory and would be highly desirable.

❧ The top 24 also include three native British species that are a) relatively common in the wild in the UK and b) listed in the RHS *PlantFinder 2000-2001* as being available commercially as already-grown plants - *Asplenium ceterach, Cryptogramma crispa,* and *Dryopteris aemula.* Possibly these spores were being sought mainly by non-UK residents and highlight the international character of the BPS. What is a native fern in one country may be foreign in another. **[MN-S: The small number of listings in the *PlantFinder* does not amount to 'commercial availability'; MR: I know no one offering these commercially.]**

❧ Continuing with this theme of commercially-available plants, in fact a majority (15/24) of the requested taxa are in the RHS *Plantfinder 2000-2001*. It would thus seem that Society members might want plenty of spare ferns, for experimental plantings, sale or donation. Or perhaps simply for the satisfaction of watching mature ferns develop from the traces of brown dust in a spore packet.

❧ As already mentioned, three *Woodwardia* species were close to the top of the list. All three are impressive garden plants.

❧ Only two of the top 24 requests were for species selected from the 74 with the *Award of Garden Merit* (AGM) from the Royal Horticultural Society.

❧ Only one of the top 24 – *Polystichum drepanum* – is in the *IUCN Red List of Endangered Species*.

❧ One species – *Ophioglossum pendulum* – belongs to a genus that is commonly regarded as not amenable to culture from spores (except presumably by the Great Gardener in the Sky). Do the 13 members who requested it know something that should be shared with the rest of us who have never successfully grown an *Ophioglossum* species from spores?

Native British Ferns

Let us now take a look at the spore-request data (Table 2) for native British fern species and their cultivars. As already highlighted in Table 1, the most popular native British ferns for spore culture were the two woodsias with 21 requests each. Next was *Asplenium ceterach*, with 18 requests. It was followed in close order by *Polystichum lonchitis* (16), *Cryptogramma crispa* (15) and *Dryopteris aemula* (14). At the other end of the popularity scale were *Dryopteris affinis*, *D. carthusiana* and *Polypodium vulgare*, which nobody asked for. Even bracken received 3 requests! **[MN-S: *Pteridium* is often requested by botany research students. I am not quite sure why, as I don't think germination is particularly good. If you want something to germinate well, choose *Athyrium* or *Dryopteris* species.]**

Table 2. British ferns and their cultivars in the BPS *Spore Exchange List*, 2001 and their delivery to members. With the species and hybrids, the bracketed numbers are Number of requests filled/Total requested, and with the cultivars it is the Numbers of filled requests. Note that to save space, the cultivar names are not given here, but the numbers of requests filled are in alphabetical order, as on the BPS *Spore Exchange List*, 2001).

Anogramma leptophylla (9/12)
Asplenium adiantum-nigrum (5/5)
-------cultivars (3, 1)
Asplenium ceterach (18/18)
Asplenium csikii (4/8)
Asplenium ruta-muraria (9/9)
Asplenium scolopendrium: (1/1)
-------cultivars (8, 8, 8, 7, 6, 5, 5, 5, 5, 5, 4, 4, 4, 3, 3, 1, 1, 1, 1, 1)
Asplenium septentrionale (11/15)
Asplenium trichomanes (5/5)
-------cultivars (9, 2)
Asplenium viride (10/10)
Athyrium filix-femina (2/2)
-------cultivars (11, 9, 7, 7, 5, 5, 4, 4, 3, 3, 3, 2, 2, 2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0)
Athyrium flexile (1/1)
Blechnum spicant (5/5)
-------cultivars (7, 6)
Cryptogramma crispa (15/15)
Cystopteris dickieana (8/8)
Cystopteris fragilis (9/9)
-------cultivars (6, 6)
Dryopteris aemula (14/14)
Dryopteris affinis (0)
-------cultivars or ssp (4, 4, 3, 2, 2, 2, 2, 2, 2, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
Dryopteris x *ambrosiae* (1/1)
Dryopteris carthusiana (0)
-------cultivar (4)
Dryopteris cristata (4/5)
Dryopteris dilatata (3/3)
-------cultivars (4, 2, 2, 1, 0)
Dryopteris expansa (5/5)
Dryopteris filix-mas (3/3)
-------cultivars (4, 3, 3, 3, 3, 3, 2, 2, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0)
Dryopteris oreades (4/4)
Dryopteris x *remota* (3/3)
Dryopteris submontana (4/4)
Gymnocarpium dryopteris (8/8)
-------cultivar (8)
Gymnocarpium robertianum (6/6)
Ophioglossum vulgatum (9/14)
Oreopteris limbosperma (12/12)
Phegopteris connectilis (5/5)
Polypodium australe (6/6)
-------cultivars (5, 5, 4, 4, 3, 1, 1, 0, 0, 0)
Polypodium interjectum (2/2)
Polypodium vulgare (0)
-------cultivars (9, 5, 4, 4, 1, 1)
Polystichum aculeatum (2/2)
-------cultivar (1)
Polystichum lonchitis (16/16)
Polystichum setiferum (3/3)
-------cultivars (10, 8, 7, 7, 6, 6, 6, 5, 5, 4, 4, 4, 3, 3, 2, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0)
Polystichum x *illyricum* (3/11)
Pteridium aquilinum (3/3)
Woodsia alpina (12/21)
Woodsia ilvensis (15/21)

THE BPS SPORE EXCHANGE

Ophioglossum vulgatum, whose difficulty in growing from spores is notorious, received 14 requests of which only 9 could be filled. We look forward in 7 or 8 years time to learning how these turn out. Reference is made to Jack Bouckley's (1989) article in this magazine. His advice was not to discard in despair the pots with no apparent growth, without first a) allowing them to grow outside, uncovered in the garden, and to be forgotten; then to let them become contaminated with several years' growth of common garden weeds; and b) when dumping them out, to examine carefully the soil for underground gametophytes!

In summary, Table 2 shows that the BPS *Spore Exchange 2001* list offered 38 of the approx 52 native species of British fern, together with 3 hybrids, and that 14 of the species had cultivars. Of the latter, the most sought after was *Athyrium filix-femina* 'Clarissima Bevis Superbum' (11 requests). **[MR: This cultivar does not exist. The correct name is 'Plumosum Divaricatum'.]** Closely following was *Polystichum setiferum* 'Plumosodivisilobum' (10 requests). The Table shows that among the numerous offered cultivars of *Dryoperis affinis*, *D. filix-mas* and *P. setiferum*, a substantial proportion received few or no requests. Perhaps the desire for numerous cultivars of the commoner native species is becoming satiated? **[MN-S: some of the names are sometimes rather dubious.]**

Missing from Table 2 are a few British species, such as *Asplenium marinum* and *Thelypteris palustris* whose spores have appeared on BPS *Spore Exchange Lists* from time to time, but not in 2001. Also potentially available are the short-lived spores of *Osmunda regalis* and some cultivars which may be obtained each year by special arrangement from Matt Busby.

Then we are left with the 'unavailable unculturables' of the native fern flora – at least from spores – *Botrychium lunaria*, the two *Hymenophyllum* species, *Trichomanes speciosum*, and *Ophioglossum azoricum* and *O. lusitanicum*. They present a continuing challenge for those who enjoy tackling what is customarily regarded as a near-impossible task.

AGM Ferns

We have already alluded in Table 1 to ferns that have been given the accolade of *Award of Garden Merit* (AGM) by the Royal Horticultural Society. In making these awards, the RHS has been quite selective, although some of the choices of merit (e.g. *Blechnum spicant*) and omissions (e.g. *Woodwardia fimbriata*) may cause surprise. The majority of the 74 AGM ferns are for planting outside in a British garden, but a few of the taxa are specifically listed as requiring glass, either heated (e.g. *Blechnum tabulare*) or unheated (e.g. *Dicksonia squarrosa*). The declared features that a plant must possess to qualify for an AGM are:

- Outstanding excellence for garden decoration or use;
- Available in the trade;
- Of good constitution;
- Requires neither highly specialist growing conditions nor care.

Table 3 matches the list of AGM ferns with the BPS *Spore Exchange List*, 2001 and with the requests for spores. It will be seen that 51 taxa, or nearly 70%, of the 74 AGM ferns were available as BPS spores, taking Matt Busby's offers of *Osmunda* spores into account. The delivery figures

Table 3. List of the 74 RHS *Award of Garden Merit*, 2000 ferns, their availability in the BPS *Spore Exchange List*, 2001 and (number of filled requests). [Taxa in square brackets] were not in the BPS *Spore Exchange List*, 2001.

[*Adiantum aleuticum*]
---------- var *subpumilum* (9)
---------- *pedatum* (5)
[---------- *raddianum*]
[---------- 'Brilliantelse']
[---------- 'Fritz Luthi']
[---------- 'Kensington Gem']
---------- *venustum* (15)
[*Asplenium bulbiferum*]
[---------- *nidus*]
---------- *scolopendrium* (1)
[----------'Crispum Bolton's Nobile'] [1]
----------'Kaye's Lacerated' (8)
---------- *trichomanes* (5)
Athyrium filix-femina (2)
---------- 'Frizelliae' (2)
---------- 'Vernoniae' (2)
---------- *nipponicum* var. 'Pictum' (10)
---------- *otophorum* (10)
Blechnum chilense (18)
---------- *penna-marina* (10)
---------- *spicant* (5)
---------- *tabulare* (8)[2]
Cyrtomium falcatum (4)
---------- *fortunei* (4)

[*Davallia canariensis*]
[----------*mariesii*]
Dicksonia antarctica (5)
[---------- *fibrosa*]
---------- *squarrosa* (4)
Dryopteris affinis: (0)
---------- 'Crispa Gracilis' (1)
[---------- 'Cristata'] [3]
---------- 'Cristata Angustata' (2)
---------- 'Polydactyla Mapplebeck' (4)
---------- *cycadina* (4)
Dryopteris dilatata (3)
---------- 'Crispa Whiteside' (4)
---------- 'Lepidota Cristata' (1)
---------- *erythrosora* (5)
---------- 'Prolifera' (5)
---------- *filix-mas* (3)
---------- 'Crispa Congesta' (0)
---------- 'Cristata' (1)
---------- 'Grandiceps Wills' (3)
---------- *wallichiana* (7)
Gymnocarpium dryopteris (8)
---------- 'Plumosum' (8)
Matteuccia struthiopteris (10)
[*Onoclea sensibilis*]

[*Osmunda cinnamomea*]
[---------- *claytoniana*]
---------- *regalis*
---------- 'Cristata'
Platycerium bifurcatum (3)
---------- *superbum* (6)
---------- *veitchii* (4)
Polypodium aureum (4)
[---------- *cambricum* 'Cambricum'] [1]
[---------- 'Grandiceps Fox']
[---------- 'Wilharris']
[---------- *glycyrrhiza* 'Longicaudatum']
[---------- *interjectum* 'Cornubiense']
Polystichum aculeatum (2)
---------- *munitum* (5)
---------- *polyblepharum* (4)
---------- *setiferum* (3)
---------- Divisilobum Group (5)
[---------- 'Divisolobum Densum']
[---------- 'Divisolobum Iveryanum'] [1]
[---------- 'Pulcherrimum Bevis'] [1]
---------- *tsus-simense* (7)
Woodsia polystichoides (12)
Woodwardia radicans (9)

[MN-S: [1]This taxon has sterile fronds, therefore spores will not be available; [2]Note that there is potential for confusion with *B. chilense*. The RHS *B.* tabulare is in the AGM List as requiring heated glass protection and being rare in cultivation. [3]Is this not *D. affinis* 'Cristata the King', and therefore on the BPS 2001 Spore List?]

to BPS members suggest that, consciously or subconsciously, a considerable proportion of the choices from the Spore List was made with AGM features in mind. The table contains three cultivars with only sterile fronds and which could never rightly appear on a spore list. There are no *Cheilanthes* species with AGM status, presumably because of difficulty of maintenance in cultivation. Note that these data were analysed and tabulated only for the requests that were met and not for any shortfalls due to insufficiencies.

Popularity of Particular Groups

The majority of genera had a very high proportion of their spore list species requested at least once. Thus with *Cheilanthes* for example, all 19 listed species were requested. A similar 100% request rate was also seen with *Adiantum* (11 taxa), *Blechnum* (21 taxa), *Platycerium* (14 taxa), *Polystichum* species (39 taxa), *Woodsia* (4 taxa) and *Woodwardia* (4 taxa). Only slightly less popular were *Asplenium,* where 23 of the 24 offered species were requested, as were all 18 cultivars of *A. scolopendrium*. With *Athyrium*, 5 of the 7 species on offer were asked for, as compared with only 24 of the 31 cultivars. High request ratios were also seen with *Pteris* (13 out of 14) and with *Dryopteris* species (46 of 51), but with a lower rate for the cultivars of *D. affinis* and *D. filix-mas.*

Tree fern spores were much in demand, with 38 of the 40 *Cyathea* taxa requested, all 8 of the *Dicksonia* species and both species of *Cibotium.* With this overall high level of request, it is perhaps significant that noone asked for *Nephelea tryoniana*, a Meso-American tree fern, probably because of unfamiliarity with the generic name. In other taxonomic schemes, *Nephelea* is included within *Alsophila* or in *Cyathea.*

Unrequested Taxa

The Appendix Table 5 records the 51 taxa from the BPS *Spore Exchange* list that attracted zero requests. Over one-half of these were cultivars of common British species and 6 were perhaps unattractive because of incomplete naming. As already noted, the spores of *Dryopteris affinis*, *D. carthusiana* and *Polypodium vulgare* were apparently of interest to no one.

Several of the species were probably not requested because of unfamiliarity, rather than lack of merit. Otherwise one might expect BPS members to jump at the chance of cultivating rarely-offered ferns from Japan (*Dryopteris gymnosora*), India (*D. odontoloma*), New Zealand (*Hypolepis dicksonioides*) or South Africa (*Asplenium gemmiferum*). With the numerous requests for compact species, it is surprising that *Pellaea ovata* was of no interest. *Macrothelypteris torresiana* is a large, handsome and easy to grow species, but requires glass protection. We were unable to find any information on *Asplenium melanolepis*, *A. spinulosum* and *Doodia maxima* in standard texts on growing ferns (Hoshizaki & Moran, 2001; Jones, 1987; Mickel, 1994; and Rickard, 2000).
[MN-S: The name *Doodia maxima* has been around a long time and may be a group of several related species.]

Table 4. Number of IUCN *Red List* species of fern in the various threat categories, list of taxa in the BPS *Spore Exchange List*, 2001 and number of filled requests for spores.

Red List Category	Number of species	Taxa in the *BPS 2001 Spore List* (and number of filled requests for spores)
Ex (Presumed extinct)	5	None
Ex/E (Historical occurrence - still hope of recovery)	13	None
E (Critically imperilled)[1]	85	*Polystichum drepanum* (15) *Polystichum falcinellum* (6)
V (Imperilled) [2]	97	*Asplenium scolopendrium* var *americanum* (4) *Cyathea brownii* (6) *Loxoma cunninghamii* (3)
R (rare) [3]	356	*Asplenium aethopicum* (7) *Cyathea robusta* (3) *Dryopteris ardechensis* (3) *Polystichum setigerum* (1)
I (Indeterminate)	133	*Dryopteris corleyi* (1)

[1]: 5 or fewer occurrences, or 1000 or fewer individuals, worldwide
[2]: 6-20 occurrences, or 1000-3000 individuals, worldwide
[3]: 3000-10,000 individuals total, worldwide

Contribution to Conservation

The number of fern species in the world is commonly stated as being in the range 10,000 to 12,000 (e.g. Jones, 1987). However an exact number of 9,053 species of 'true ferns' (excluding fern allies) is given in the *1997 IUCN Red List of Threatened Plants.* (IUCN = International Union for Conservation of Nature and Natural Resources) Of this total, 683, or 7.5%, are listed as being 'threatened', from the conservation standpoint. There are six coded levels of threat: Ex = *Presumed extinct*; Ex/E = *Historical occurrence, still hope of recovery*; E = *Critically imperilled*; V = *Imperilled*; R = *Rare* and I = *Indeterminate*. Categories E, V and R have additional numerical definitions listed in the footnote to Table 4.

The most desirable action with these threatened species is obviously to diminish the threat by conserving the habitats of natural occurrence, namely *in*

situ conservation. Alternatively, however, it may be necessary to consider *ex situ* conservation, meaning horticulture – keeping the species going as live plants in gardens, or in refrigerated storage as spores. In effect, the BPS *Spore Exchange* is an important agency for promoting *ex situ* conservation. Such *ex situ* conservation has been of critical importance for removing the threat of extinction of some well-known garden trees. Consider the Monkey Puzzle, *Ginkgo* and the Dawn Redwood, each of which is rare or imperilled in the wild, but unlikely to become extinct because of widespread cultivation in parks and gardens.

What then is the position with ferns, and is the *BPS Spore List* rich in threatened species? Table 4 summarises the position and shows that the answer is *No*.

The first two columns give the Red List categories and the number of threatened fern species in each. The right hand column gives the threatened species that were available as spores from the 2001 BPS List and the number of filled requests for spores. Of the 85 species in the *Critically imperilled* category, only two were available as spores. Both *Polystichum drepanum* and *P. falcinellum* are Madeiran species, and both were well requested by members of the Society. In the next category of *Imperilled*, the spore list offered only three of the 97 potential taxa, all of which were of interest to members. Likewise of the 356 *Rare* species, the four on the spore list were all requested. Only one of the final category of *Indeterminate* was listed but it attracted only one request.

In summary, only 10 of the 683, or 1.5 %, of the *Red List* fern species were available as spores through the BPS in 2001. Highlighting this situation, as here, is the first step in trying to increase awareness of the conservation possibilities of the BPS *Spore Exchange*. The way forward would then be to identify possible sources of spores of the threatened species and to obtain and distribute samples of them. Such availability of spores would allow members of the Society worldwide, with all their accumulated horticultural expertise, to attempt to bring the threatened species into cultivation and thereby help ensure species survival. The BPS could thus make a significant contribution to *ex situ* conservation that would be especially important for those species whose natural habitats are disappearing, despite attempts to protect them. Paradoxically, such efforts could be frustrated by the 'bureaucratic obstacle courses' set up by the very authorities responsible for conservation.

Blowing in the Wind

The BPS *List of Spores* for the current year (2002) differs from all its predecessors in an important respect – aside from the actual spores listed. It carries at the beginning a new requirement for donors:

Recent legislation concerning the legality of distributing spores means that we now have to ask prospective donors to our exchange to ensure that the spores they donate are compliant with international law and with their national rules and regulations. We accept spores on the basis that they have been legally acquired and that they can be freely distributed through our exchange, with no restrictions on personal or professional use.

Thus there are several streams of national and international legislation that now impinge on spore acquisition and distribution. Such matters are regularly reviewed by the BPS Committee. The basic theme is each country's right of ownership of the genetic resources within its own native flora, dating from the Rio Convention of 1992. The stimulus was the past exploitation of commercially valuable plants without benefit to the source countries. However, the unfortunate upshot is that some countries are doing little to protect their indigenous ferns from habitat loss, while covering all species with blanket legislation to control the collecting and distributing of propagules. The spores themselves are unaware of all this and blow away in the wind as they have always done, and then mostly fail to produce new plants.

Fern horticulture, as supported by the BPS *Spore Exchange* scheme, has the potential to help protect vulnerable fern species, which generally have little commercial value. This could be done by promoting *ex situ* conservation through worldwide BPS membership, and without damage to the threatened plants. In Britain, where *Woodsia ilvensis* is rare and disappearing, re-population of former habitats has recently been undertaken by introducing sizeable populations of new plants, purpose-grown from spores. Here we have a pioneering example of horticultural rescue that could be applied elsewhere.

Going hand in hand with losses of native habitats is the proliferation of laws about conservation. This has led to morasses of rules, and mountains of paperwork that seem to take precedence over making sure that a species actually survives. The BPS Committee recognises this as a fact of life, hence the new requirements for spore donors. To gain access to spores of the rare and threatened ferns will therefore require well-argued and patient approaches to the relevant authorities. Meanwhile it is important for us to tread carefully. A useful initiative for members of the BPS henceforth would be to find out whether their local botanic garden has any of the *Red List* ferns and whether the authorities there would give permission for spores to be collected and distributed through the BPS *Spore Exchange*.

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SPORE EXCHANGE - COUNTY FERNS?

APPENDIX

Table 5: Fern taxa whose spores on the BPS *Spore Exchange List*, 2001 were not requested by anyone that year.

Asplenium gemmiferum
Athyrium filix-femina 'Cristatum'
----------'Cristatum' Group
----------cruciate pinnules
----------'Cruciatum' Group
----------'Grandiceps'
----------'Percristatum'
----------'Setigerum-Corymbiferum'
----------var *sitchense*?
----------*melanolepis*
----------*spinulosum*
Cyathea sp. (Malaysia) 'Floccagera'
Diplazium melanopodium
Doodia caudata var. *laminosa*
--------- *maxima*
Dryopteris affinis
----------ssp. *affinis*
Dryopteris affinis 'Crispa'
----------'Grandiceps Wills'?
----------'Polydactyla'?
----------var *punctata*
----------*atrata*[1]
----------*carthusiana*
----------*x complexa*
----------*x complexa* 'Stableri'?
----------*dilatata* 'Lepidota'?
Dryopteris filix-mas 'Crispa'?
---------- 'Crispa-Congesta'?
---------- 'Cristata Jackson'?
---------- 'Depauperata'?
---------- 'Linearis Cristata'?
----------'Linearis Polydactyla'?
----------'Polydactyla Dadds'?
---------- *gymnosora*
Dryopteris odontoloma
Hypolepis dicksonioides
Lunathyrium sp.
Macrothelypteris torresiana
Nephelea tryoniana
Pellaea ovata
Polybotrya JRD 958
Polypodium australe 'Cristatum Old Form'
----------'Pulchritudine'
----------*vulgare*
Polystichum setiferum 'Cristatum'
----------'Cristatum' Group
----------'Divisilobum' Group
----------'Multilobum'
----------'Revolvens' Group
Pteris sp., probably *linearis*
Thelypteris sp. [2]

[MN-S: [1]Europeans distribute *D. cycadina* under this name. *D. atrata* is a tender species - see Rickards's book; [2]*Thelypteris* species were never popular apart from *T. palustris*].

COUNTY FLOWERS - COUNTY FERNS?

Alastair Wardlaw

The charity Plantlife, whose patron HRH The Prince of Wales we share, launched its *County Flowers* project last spring, to celebrate HM The Queen's Golden Jubilee.

The basic idea is that everyone in the UK is encouraged to vote for one, or several, favourite wild flowers - one that symbolises the county where they live and one in each of the counties they visit in 2002.

The project also celebrates the natural beauty to be found throughout the UK. The hope is that more people will be stimulated to visit the countryside again, post foot and mouth, thereby contributing to the rural economy. The BPS was invited to participate by bringing the project to the attention of its members, hence this note.

Apparently ferns and other pteridophytes are considered to be 'wild flowers', or at least so I was told when I phoned the Plantlife office and asked why the project was not called *County Plants* if the intention was to include ferns. My informant replied that 'people would expect ferns to be included as wild flowers', and indeed so it has proved.

In *The Times* of April 10 there was a beautifully illustrated article about the *County Flowers* project, with the species then nominated for each county. Although most of the proposals were for flowering plants, with orchids figuring prominently, there were in fact a few ferns:

Cornwall and Devon both had royal fern nominated among their wild flowers, Cumberland had parsley fern and Monmouthshire included maidenhair spleenwort. In Scotland, Argyll and Perthshire both listed the fir clubmoss, Dumfriesshire had oblong woodsia and Kincardineshire suggested Dickie's bladder fern. There were no ferns nominated from Northern Ireland.

Subsequently Plantlife must have had a change of heart about *Woodsia ilvensis* and *Cystopteris dickieana*, because the website (www. plantlife.org.uk) in mid-June stated:

Some of the species originally suggested by Plantlife or subsequently suggested by voters have been removed from the list below and from the pull-down lists on the online voting form. Rare and endangered species have been removed, owing to the fears that the scale of press coverage of the project may lead to an increased risk to these species from collection.

Osmunda regalis from Thos. Moore's *The Nature Printed British ferns*, 1859.

Thus by mid-June the nominated fern species were reduced to royal fern in Cornwall and Devon, maidenhair spleenwort in Monmouthshire, fir clubmoss in Argyll and Perthshire but additionally, Adder's tongue was now a candidate in Lincolnshire.

The procedure for registering your vote online is very straightforward and I recommend all UK members of the Society to go to www.plantlife.org.uk and participate. You might wish to suggest a new fern species or to vote for one already there. Readers are allowed only one guess as to which plant I voted for after a trip to Cornwall this spring.

Voting closes on December 1st and the final choice for each county will be announced in February 2003. None of us need to be reminded that Plantlife does an excellent job of helping to protect our native flora, and anything that increases public consciousness about the value of wild plants deserves to be supported.

THE SEVEN STAGES ON THE ROAD TO PTERIDOLOGICAL ENLIGHTENMENT

Barry Wright

We are born into this world knowing nothing. Some may say that's how we leave it as well. From the ignorance of youth, we acquire knowledge throughout our lives until the frequency of 'senior moments' merge and we head back to ignorance once more. The long and winding road to learning about ferns and fern allies can be a difficult one, but we all have to start somewhere. As with any form of human endeavour, there is a learning curve. It may start at a nice gentle angle, but very often it will increase in steepness until eventually it flattens out as you reach saturation point. There are a number of stages to go through as you work your way up through the ranks to become a real pteridologist. This article divides the process into a number of stages, although the divisions are not precise and there could easily be more than seven stages.

Stage 1

How does the road to pteridological enlightenment begin? As with any journey it begins with a single step. In my case it began with the realisation that not all ferns were bracken or should it be that bracken is not the only fern? This is a major step for most people. I'm sure that there are still a large number of casual visitors to the countryside who have not yet realised even this basic distinction. At this point you can safely say that you have completed Stage 1 and can move to Stage 2. This was too easy. Rest assured, the other stages are a little more challenging.

Stage 2

At this stage you are embarking on the steepening slope of the learning curve. It could be at this point that you are aware of the British Pteridological Society and may have taken the foolhardy step of joining. This is when the rot sets in as more and more of your time is spent learning about the fascinating group of plants called ferns. You may be lucky enough to have a local BPS group nearby that will welcome you with open arms. I happened to be in the society in 1983 when Jack Bouckley advertised to try and set up a Leeds and District Group. I attended the inaugural meeting and the group has developed ever since. Certainly one of the best ways to learn how identify plants or animals is to tag along behind people with knowledge and enthusiasm for the subject. It's tons better, and less effort than wading through keys and getting the identifications wrong [exception: The FSC *Fern Guide* - ed.].

Stage 2 is where you get to know the common species. It is also when you are wide open to showing how little you know. Try hard never to let anyone know that you think male fern and lady fern are different sexes of the same species! You do gain an appreciation that ferns range from the large shuttlecocks of the male ferns and lady fern down to the diminutive Aspleniums growing in mortared walls and even that there are tiddly ones that grow in grasslands. It is during this stage that a false sense of confidence is building, ready to be dashed mercilessly to the ground, and below, in stage 3.

Stage 3

Having gained a reasonable grasp of the differences between male fern, lady fern, hard fern and broad buckler fern etc., the road to pteridological enlightenment becomes a little bit more tricky. You now have to deal with problems like the fact that there is a soft shield fern and a hard shield fern and that they can look fairly similar. What is more, you glimpse in the far distance the impending monster problem of the *Dryopteris affinis* complex.

Stage 3 is the period when you consolidate your basic knowledge and have realised that this is still somewhat inadequate. People start talking about sinister things like 'dark spots' and 'J-shaped indusia'. You also realise that there is more to pteridology than just 'ferns'. There are quillworts, clubmosses and horsetails, although we don't talk much about horsetails as they tend to have a bad press, all because of one species - *Equisetum arvense*. There's always one troublemaker that spoils it for everyone. What can be nicer than a bank of *Equisetum sylvaticum* in the dappled shade of a wood, or a magnificent head-high stand of *Equisetum telmateia*? Let's see some equal rights for horsetails.

Stage 4

At Stage 4 you begin to tackle some of the more difficult aspects of fern identification. It is also at this stage that you begin to get some idea about the ecology of the species. Some species don't grow on lime-rich soils whilst others will grow happily in lime mortar. This concept of different ecological requirements will return to haunt you at later stages. This was brought home to me personally when I found the lemon-scented fern (*Oreopteris limbosperma*) growing on a limestone pavement in a wood. All of the learned texts had indicated that this species was only found on acid soils, but there it was growing happily and healthily on top of limestone. The explanation was that it was growing in the acidic humus layer on top of the limestone.

You can probably begin to "Jizz" specimens from a distance rather than having to get up close and turn the frond or poke about looking at scales, sori and tapering pinnae. This becomes important as you get older. A pair of binoculars is even better. Rather than climbing up a steep and muddy valley side you can sit on a rock, view the specimen with your binos, and declare, "Oh it's just another *Dryopteris filix-mas*". But is it? Are you being too lazy? Better still pick on some poor unsuspecting youthful member of the group and get them to slither up and bring back a frond. Unfortunately,

there don't seem to be many of those on my outings so it is usually me that ends up doing the slithering. And why do I always end up covered in mud before the pub lunch? Why can't I wait until after the repast before falling down on my dignity to the immense amusement of the group? My best attempt at this was at a national meeting in Cumbria when I slipped whilst trying to photograph *Hymenophyllum tunbrigense*. I fell back, clutching my dear camera, and landed with me and my rucksack wedged in a bush, tortoise-like and totally unable to move. The amused party had to drag me unceremoniously out of the bush and into an upright posture once more, still clutching my slightly bent and decidedly muddy camera. The best place to fall down is in private.

Stage 5

At Stage 5 you are beginning to gain respect from people that are at lower stages on their journey towards pteridological enlightenment. You are now probably at the steepest part of the learning curve where you are trying desperately to understand the complexities of the ecology and morphology of the whole range of the British Pteridophyte flora. You are now be exposed to the *Dryopteris affinis* 'problem', which, unlike a nasty rash, doesn't have a magic cream to make it go away. You will have to choose your path and join the 'lumpers' or 'splitters'. In my experience, you can have much more fun with the splitters. They can argue for hours about scale density and lamina shape and still not give the specimen a name on which they all agree. Lumpers just say "affinis borreri" and walk on to the next one. Very boring.

At this point, you start to develop an almost evangelical desire to impart some of your knowledge to lower mortals that have not yet realised that ferns are the only group of plants worth studying. These poor people wander round with their 'Gem guide to wildflowers in colour', or equivalent, waiting for the plant they are looking at to flower so they can match it up with the pretty pictures in their little book. Pteridologists are real botanists. They don't need flowers, and they can even key out a fern without using pictures!

One of my pet hates is the dichotomous key. Whoever thought of offering two choices at each stage in the key should have been shot. I am sure that the phrase "a picture paints a thousand words" was not coined yesterday. So why don't most modern keys use pictures rather than the botanically correct but totally foreign language of 'acuminate tips' and 'pinnate/pinnatifid'. Why can't authors just show what they mean in a picture for Pete's sake? I don't know about you, but my brain can compare more than 2 concepts, or pictures, at a time. Give me three or four possible choices and it could halve the time taken to key out a specimen. You should try the 'Fern flora of Meso-America' ('Helechos de Mbaracayu', by Maria Pena-Chocarro, Griselda Marin, Belen Jimenez and Sandra Knapp, 1999, Natural History Museum, London). This little book is brilliant, written in Portuguese, but a 5-year-old non-botanist from any country could key out any fern in the flora in about 5 minutes. Hats off to our beloved Editor of this journal for his effort to bring keys into the 20th century with his AIDGAP key *The Fern Guide* [which is fiercely dichotomous - ed.].

Stage 6

When you enter Stage 6, you must be feeling very pleased with the progress of your elevation through the ranks. You have got to grips with the *Dryopteris affinis* complex and have sorted some of the more difficult species like the polypodies and are now ready to tackle fuzzy things like the hybrids. This is a complete and utterly bewildering new ball game. Hybrids, by their very nature are intermediate between the two parents. This can lead to considerable debate and discussion on field meetings as to whether or not you are looking at a hybrid, or at a strange form of one of the parents. This brings back fond memories of listening to a group of splitters talking about *Dryopteris affinis* morphotypes. One of the botanists I worked with would always declare, with great authority and conviction, that any specimen she did not know was a "depauperate hybrid", hoping that this would not be challenged.

If you are very good, you might get to go to a meeting where the leader insists on shoving your head into a deep dark hole in some rock to look at *Trichomanes speciosum* gametophytes. It's a bit like the Emperor's new clothes. You have absolutely no idea what you are looking at, but emerge with an enthusiastic smile saying such wildly inaccurate things as "wow, that's fantastic" and "I'm really glad I walked 7 miles up a boulder strewn and thickly wooded valley to see that". It must be a constant source of amusement to passers-by to see a group of people one-by-one stick their heads into a rocky hole. If I were them I'd walk on quickly, suspecting some sort of strange initiation ceremony was going on.

Stage 7

You have now got to grips with the main species, their ecology, the difficult groups of species and finally the hybrids. This is when you start to move among the high rollers of the pteridological world. You feel confident about identifying things using keys and know what to expect in certain places and on different substrates. All is well with the world and you have reached that inner calm of knowing that you have finally made it in the fern world. Or have you? Why do *Trichomanes speciosum* gametophytes rarely ever produce fronds? Does the morphology of the hybrid relate to which species was the egg parent? Is there ever going to be a key to the *Dryopteris affinis* complex?

It doesn't matter what stage you think you are at, the main thing is to get out there and enjoy the pleasures of studying ferns in their natural surroundings. Enjoy the company, the places you get to visit and the plants you get to see.

A New BPS Special Publication - No. 6

BPS Minute Book CD

"A Time Capsule of Pteridology"

- A colour facsimile copy (on CD) of the BPS Minute Book has been produced by Barry Wright and will be available by subscription at a cost of £10 (incl. P&P, within the UK, overseas extra).

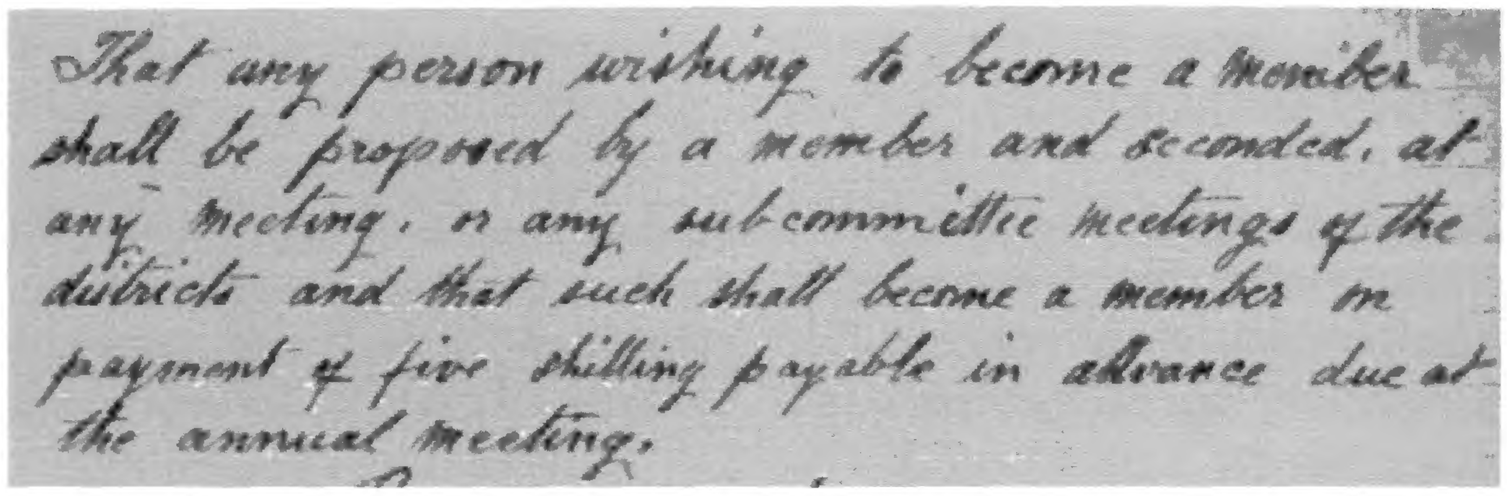
- If you have access to a reasonably up to date computer that will read a CD, and have a sense of history, then you will be interested in this unique pteridological archive. It documents the birth and changing fortunes of the BPS - the World's oldest Fern Society - as recorded in 93 years of the BPS Committee Minute Book.

- The original Minute Book itself - the Society's most valuable document - exists only as a single 3 kg bound volume with marbled covers and ruled lines. Entries are in handwriting in the early years and as stuck-in typescript later. The CD facsimile presents all the 633 pages of recorded Committee deliberations from 1891 to 1983. It shows the tea stains and yellowing pages indicative of age.

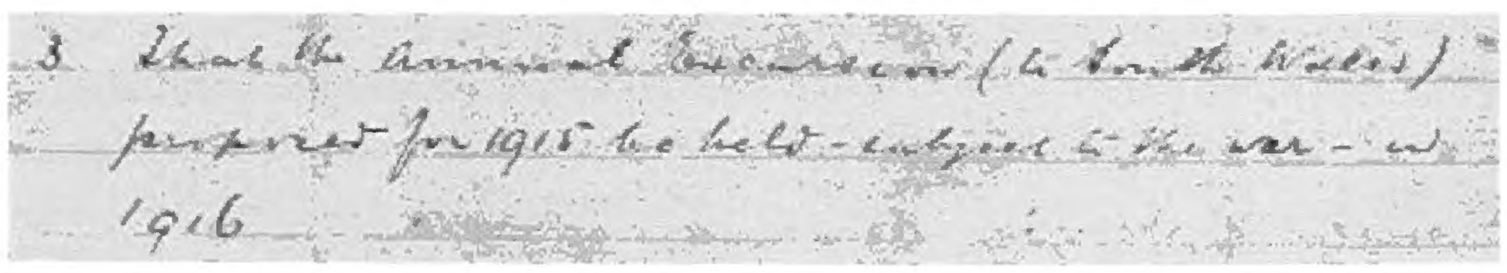
- If you wish to purchase a copy of the CD (to be available from Autumn, 2002), please order from Booksales (*see opposite*).

Price £10 inc. P+P.

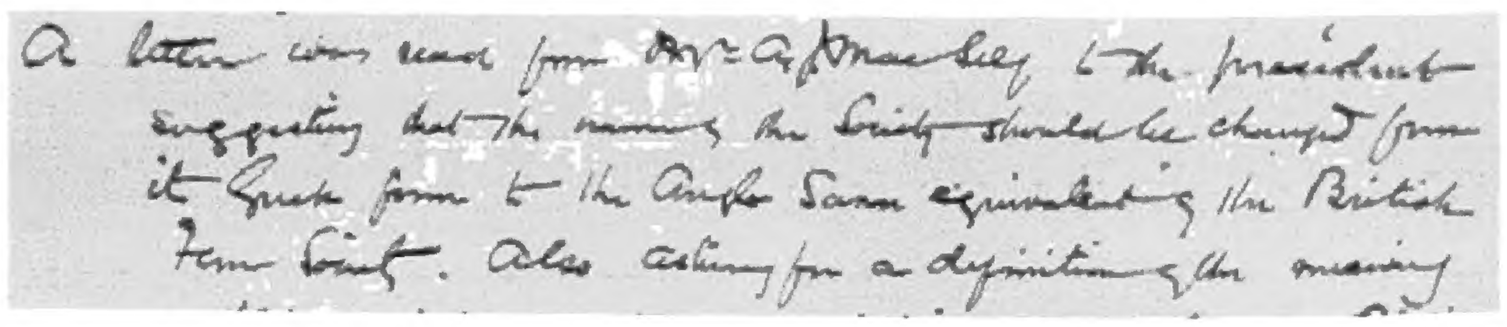
- The scanning of the Minute Book, and the production and organisation of the CD, was done by Barry Wright. The design work for the case is due to Rosemary Hibbs.



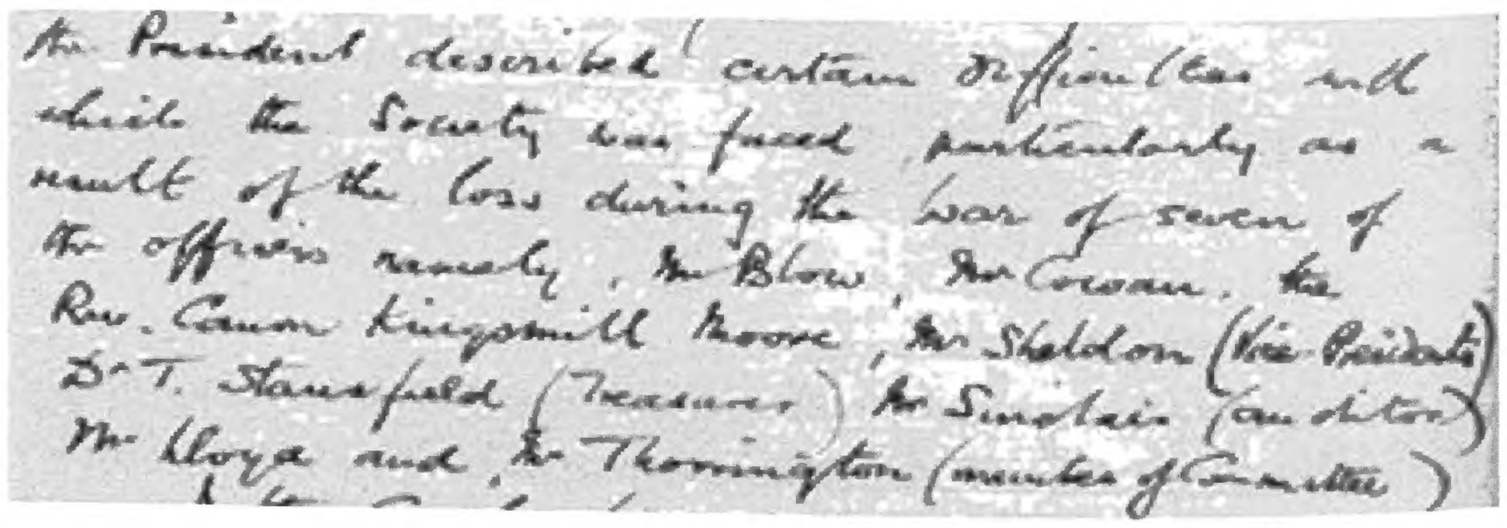
...shall become a member on payment of five shillings...?
September 23, 1891 p. 9



That the annual Excursion (to South Wales) proposed for 1915 be held - subject to the war - in 1916...
August 2, 1915 p. 140



A letter was read from Mr A. J. MacSelf to the president suggesting that the naming of the Society should be changed from its Greek form to the Anglo Saxon equivalent of the British Fern Society...
September 3, 1928 p. 177



...the loss during the war of seven of its officers...
September 16, 1947 p. 246

THE BRITISH PTERIDOLOGICAL SOCIETY

Registered Charity No. 1092399

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The BRITISH PTERIDOLOGICAL SOCIETY was founded in 1891 and today continues as a focus for fern enthusiasts. It provides a wide range of information about ferns through the medium of its publications and other literature. It also organises formal talks, informal discussions, field meetings, garden visits, plant exchanges, a spore exchange scheme and fern book sales. The Society has a wide membership which includes gardeners, nurserymen and botanists, both amateur and professional. The Society's journals, the *Fern Gazette, Pteridologist* and *Bulletin,* are published annually. The *Fern Gazette* publishes matter chiefly of specialist interest on international pteridology, the *Pteridologist,* topics of more general appeal, and the *Bulletin,* Society business and meetings reports. **WWW site**: http://www.eBPS.org.uk. Membership is open to all interested in ferns and fern-allies. **SUBSCRIPTION RATES** (due on 1st January each year) are Full Personal Members £20, Personal Members not receiving the *Fern Gazette* £16, Student Members £10, Subscribing Institutions £33. Family membership in any category is an additional £2. Applications for membership should be sent to the Membership Secretary (address above) from whom further details can be obtained. (Remittances made in currencies other than Sterling are £5 extra to cover bank conversion charges). **Airmail** postage for all journals is an extra £4, or for those not receiving the *Fern Gazette* £2.50. **Standing Order** forms are available from the Membership Secretary and the BPS web site. **Back numbers** of the *Fern Gazette, Pteridologist* and *Bulletin* are available for purchase from P.J. Acock, 13 Star Lane, St Mary Cray, Kent BR5 3LJ; E-mail: BackNumbers@eBPS.org.uk.