

**THE  
FERN SOCIETY  
OF  
VICTORIA  
Inc.**

REGISTERED BY AUSTRALIA POST: PUBLICATIONS No. VBH3411

# NEWSLETTER

VOLUME 14 Number 11, December 1992



# FERN SOCIETY OF VICTORIA Inc.

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

OFFICE BEARERS:

President:	Barry White	Phone	337 9793
Imm. Past President:	Robert Lee	"	836 1528
Vice President:	Terry Turney	"	807 4886
Secretary:	John Hooper	"	434 1239
Treasurer:	Don Fuller	"	306 5570
Membership Secretary:	John Oliver	"	879 1976
Spore Bank Manager:	Barry White	"	337 9793
Editor:	Robert Lee	"	836 1528
Book Sales:	Stephen Ziguras	"	388 1771
(25 Ewing Street, Brunswick, Vic., 3056)			

---

SUBSCRIPTIONS:

Single	-	\$15.00	(Pensioner/Student - \$11.00)
Family	-	\$18.00	(Pensioners - \$13.00)
Overseas	-	A\$30.00	(by Airmail)

Subscriptions fall due on 1st July each year.

---

PRESIDENT'S MESSAGE:

**December Meeting:** This month Keith Hutchinson will be presenting a series of slides taken on his recent trip to England and Holland, and featuring some of the flowers and ferns of these two countries. Keith's slides are noted for their quality and will be a fitting way to round off the year. We will be having the special Christmas supper, there will be a special door prize, and Christmas hampers will be raffled. Members are asked to bring along a plate for the evening's supper, also donations of items for the Christmas hamper raffles are requested.

**Fern Competition:** To fit in with Keith's talk, the fern competition category this month is a fern native to England. The following ferns are examples of appropriate ferns :- *Adiantum capillus-veneris*, *Asplenium scolopendrium*, *A. ceterach*, *A. maritimum*, *Athyrium filix-femina*, *Blechnum spicant*, *Dryopteris carthusiana*, *D. filix-mas*, *Osmunda regalis*, *Polypodium vulgare*, *P. australe*, *Polystichum aculeatum*, *P. lonchitis*, *P. setiferum*. These ferns and their massive number of varieties should give members ample opportunity to bring along one or more ferns and put on a good display for our final meeting for 1992.

Congratulations to Dorothy Forte for sweeping the pool in last month's competition; she is very close to being appointed an assistant adjudicator!

**Autumn Show:** After quite a deal of consultation and consideration the Committee has decided not to hold an Autumn Show this coming year. The main reasons are the declining attendances, reduced returns, and worker fatigue with the burden tending to fall on the same few people year after year. This decision only relates to the coming year, and consideration will need to be given to possible alternatives for the future.

(continued opposite)

NEXT MEETING

DATE: Thursday, 17th November, 1992.  
TIME: Commencing at 7.30 p.m.  
VENUE: The National Herbarium, Royal Botanic Gardens,  
 Birdwood Avenue, South Yarra.  
 (Melway Directory Ref. 2L A1)  
TOPIC: A HORTICULTURAL TRIP TO HOLLAND AND ENGLAND  
SPEAKER: Keith Hutchinson

MEETING TIMETABLE

7.30 p.m. Pre-Meeting Activities:- Sales of Ferns, Spore, Books  
 and Special Effort Tickets ; Library Loans.  
 8.00 p.m. December General Meeting  
 8.20 p.m. Topic of the Evening  
 9.30 p.m. Fern Competition Judging  
 Fern Identification and Pathology  
 Door Prize Draw  
 Special Effort Draw  
 9.45 p.m. Supper  
 10.15 p.m. Close.

Please Note:

- (1) Collect your free Door Prize ticket at the entrance to the hall.
- (2) Please bring along a small plate of goodies for the supper table. Contributions to the Christmas hampers for the Special Effort would also be appreciated.
- (4) The category for the Fern Competition this month is a fern native to England. See President's Message for examples.

---oo000oo---

PRESIDENT'S MESSAGE: (continued)

**Book Sales:** At our last meeting one of our brand new members, Stephen Ziguras, volunteered to take over the book sales from Derek Griffiths. Our thanks go to Stephen for stepping into the breach and allowing this service to continue.

**Christmas Wishes:** May I wish all members a happy and holy Christmas and best wishes for the New Year. I thank everyone for their support during '92 and look forward to a successful '93 for the Society.

Regards,  
Barry White



SPEAKER REPORT - GENERAL MEETING - 19TH NOVEMBER, 1992

Speaker: Mary Frost

Subject: FERNS OF FIJI

Earlier this year Mary and Garnet Frost, Dorothy Forte and Norma and John Hodges made a trip to Fiji, beginning with a flight from a cold 2°C at Melbourne airport to a steamy 34°C at Nandi airport in Fiji. During the visit it rained every night and was fine and hot every day, conditions which were reflected in the prolific growth of the plant life both in the forest and around Suva where they stayed.

Mary, with commentary back-up from the other members of the party and assistance in fern identification from Chris Goudey, showed many slides taken on the trip, covering not only ferns and other vegetation but also some scenic and social aspects.

The ferns were "absolutely outstanding" - prolific in both number and variety and often huge in size. The slides started with a tree-fern that had the keels of the ribs on the tops of the fronds instead of on the undersides. Then we saw a huge *Blechnum* with bright red new fronds, *Dicranopteris linearis*, several varieties each of *Davallia*, *Pyrrosia* and *Tectaria*, etc., etc. The native *Davallia fejeensis* is not as fine as the form commonly cultivated. Drynarias were prolific and often very large (over 2m across); the species there are the same as in Australia.

The Climbing Swamp Fern, *Stenochlaena palustris*, covered palms (of which there were numerous species) and other host trees in spectacular fashion. The Walking Asplenium, *Asplenium prolongatum*, was also seen working its way up trees by the buds which it produces on the tips of its fronds. Some of the fronds of *Acrostichum speciosum*, the Mangrove Fern, were up to two metres high.

Near a series of cascading pools (which varied in temperature from warm at the top to cold at the bottom) was *Diplopterygium longissimum*, which looks like a giant Coral Fern with very long fronds.

Tassel ferns were spectacular both in size and variety, as were members of the other fern ally genus *Selaginella* (including one giant form). Filmy ferns abounded in great beauty and variety, some very large and one absolutely enormous - with a frond as long as a forearm and hand combined.

The green of the ferns and trees was enlivened by numerous epiphytic and terrestrial orchids and by brightly-coloured butterflies.

Probably the highlight of the trip was the spectacle of a very large weeping *Ficus* tree with every limb completely covered by masses of *Davallias*, *Drynarias*, *Pyrrosias* and orchids. This was growing right out in the open in a field.

A number of the ferns they saw remained unidentified, because they were unable to find sufficient literature about Fijian ferns. Towards the end of the trip they managed to locate the Herbarium at the University of the South Pacific, where the staff were very helpful. Anyone going to Fiji to look at ferns should plan to visit the Herbarium before going off into the bush.

(continued page 131)



The following article is reproduced, with thanks, from "Fiddlehead Forum", the Bulletin of the American Fern Society, Vol.19, Nos 4&5, 1992. It is easy to understand why *Salvinia molesta* has been classified as a noxious weed in many countries, including Australia and New Zealand.

## THE STORY OF THE MOLESTING SALVINIA

Robbin C. Moran  
Missouri Botanical Garden

Would you believe that a small fern could threaten the way of life of 80,000 people? Would you believe that it could, with no malicious intent, cut them off from food, medical care, and schools, literally forcing them to move from their homes? It is hard to believe, but this is exactly what happened in the early 1980s when a small, floating, aquatic fern began to multiply exponentially in the Sepik River floodplain of Papua New Guinea.

The fern in question was an introduced species of *Salvinia* capable of doubling its size in a little more than two days. Under the tropical sun of the floodplain, it multiplied rapidly and soon carpeted the surfaces of rivers, lakes, and lagoons. It formed extensive floating-mats and as the reproducing plants surged over one another, they pushed the older plants below the water where they turned brown and slowly decayed (Fig. A). In some places, the floating mats were over one meter thick. These heavy, water-logged mats impeded travel by dugout canoe, which was the main method of transportation in this roadless region. No longer could people get to market, attend schools, or seek medical treatment. Fishing was nearly impossible. Even more distressing, the natives were cut off from their main carbohydrate food, the pith of sago palms (*Metroxylon* spp.). The palms were harvested from nearby swamps by cutting the trunks and towing them behind their canoes to the villages. In some places, infestations were so bad that entire villages had to be abandoned.



Figure A. *S. molesta*, top view of a compact growth form. This form typically occurs when plants are densely crowded in mats.

The dense mats of *Salvinia* impeded more than travel by dugout canoe. They cut off light to submerged plants, thereby lessening oxygen in the water and killing many mud-dwelling organisms. They clogged irrigation ditches, blocked drainage canals, and obstructed water pumps. In some places, the mats harbored a human blood parasite that causes schistosomiasis.

This wasn't the first time that the weedy *Salvinia* had struck. It first became a pest in 1939 in Sri Lanka where it was introduced inadvertently by someone from the Botany Department of the University of Colombo. Subsequently, it caused serious problems in Australia, India, southeast Asia,

and southern Africa. Curiously, however, the *Salvinia* never formed infestations in tropical America. In 1959, a particularly bad infestation--one that received extensive publicity--occurred on Kariba Lake, a reservoir along the border of Zimbabwe and Zambia. There, a small population of *Salvinia* took only three years to form a dense carpet covering 1000 square kilometers.

To prevent *Salvinia* from choking more of the world's waterways, something had to be done. The advice of experts in aquatic weed control was sought and at their suggestion, the mats were sprayed with herbicides. This procedure killed many plants, but invariably a few escaped to form another infestation a year or so later. Another remedy suggested was that of skimming the water surface with nets to catch and remove the plants, but this failed for the same reason as herbicides. Too many plants escaped the nets. On lakes, long booms were laid across the water in strategic places to control the spread of *Salvinia*, but the booms often broke from the weight of the plants pressing behind them. Nothing worked. Attempts to find a lucrative use for the plants, such as removing them and feeding them to cattle, were also unsuccessful.

Finally, the weed-control experts decided to search for a biological method of control. What they wanted to find was an insect that would eat *Salvinia* into oblivion. The most obvious place to begin the search was in nature, on the plant itself.

At the time, the experts thought the offending species was *Salvinia auriculata*, a native of the American tropics. They were optimistic that a suitable control insect could be found because of one curious incongruity about the weediness of the *Salvinia*: it was weedy only in the Old World where it had been introduced (probably as an escape from aquaria). In Latin America, where it was native, it was *not* weedy--the plants existed as scattered individuals and never formed extensive floating mats. This suggested that in the New World *Salvinia* was kept in check by herbivorous insects, whereas in the Old World the insects were absent, apparently not having been present on the plants originally introduced. Without the constant munching of herbivores, *Salvinia* populations grew explosively. Therefore, the researchers reasoned that the introduction of a suitable insect to the Old World populations of *Salvinia* could be an effective solution to its rapid multiplication.

In the early 1960s, entomologists traveled to Trinidad and Guyana to find out what insects ate *Salvinia auriculata* in its native habitat. They found three species that seemed promising for biological control: a moth (*Samaea multiplicaulis*), a grasshopper (*Paulinia acuminata*), and a weevil (*Cyrtobagous singularis*). Before these species could be released on infestations of *Salvinia* in the Old World, they underwent stringent host-specificity tests to ensure that they did not eat native plants or economically important crops. "This testing," says Peter M. Room, one of



the entomologists, "is in fact the most labour-intensive and time-consuming part of our job. Nobody wants to be remembered as the entomologist who destroyed a crop-growing industry or caused a native plant to be decimated!"

The testing did demonstrate that these three insects had a high degree of host-specificity to *Salvinia*, and so they were released on infestations of *Salvinia* in Africa, Fiji, and Sri Lanka. Unfortunately, the release failed in each place. None of the insects made a significant dent in the *Salvinia* populations.

In the early 1970s, during this period of searching and testing, a startling discovery was made about the weedy *Salvinia*. D. S. Mitchell, then a doctoral student at the University of London, concluded after a careful taxonomic and ecological study that the weedy *Salvinia* was not *S. auriculata* as all the experts had previously thought. Rather, it represented a new, undescribed species which he named, appropriately, *S. molesta*.

Mitchell's discovery had two implications in the search for a biological control. First, it suggested that the entomologists had wasted their time searching for insects on *Salvinia auriculata*. The insects that ate *S. auriculata* might not be the same ones that ate *S. molesta*. Clearly, what entomologists had to do was look for herbivorous insects on *S. molesta*.

Second, Mitchell's research provided a clue as to where *Salvinia molesta* might be found in nature. He had seen only one herbarium specimen of *S. molesta* from the American tropics, where it was presumed native. This specimen was collected in 1941 from a lily pool at the Botanic Garden in Rio de Janeiro, suggesting that *S. molesta* grew natively somewhere in southern Brazil. (Botanists rejected the idea that *S. molesta* was native to the Old World; given its prominence as a terrible weed, it should have been collected there much earlier than the 1930s and 1940s, when the first Old-World collections of this species were made.)

The entomologists, hoping to find indigenous *Salvinia molesta* and an insect that would eat it, travelled to southern Brazil and began searching ponds, swamps, and lagoons. In 1978, they were successful, finding numerous populations, all of which were south of Rio de Janeiro and São Paulo (between 24° and 32° south), actually outside of the tropics.

Although delighted by their discovery, the entomologists were disappointed by their catch of insects. They found what appeared to be the same species of moth, grasshopper, and weevil which had been proven ineffective in controlling *S. auriculata*. Nevertheless, they thought that another field test with the insects was justified because the insects might represent races specialized to eat *S. molesta*. They might, therefore, be effective in controlling infestations of *Salvinia*.

Accordingly, a field test was begun in 1980 on Lake Moondarra in central Queensland, Australia, which had about 200 hectares carpeted by *S. molesta*. As before, the insects were stringently tested for host-specificity to ensure that they would not harm native or crop plants. It was decided not to release the *Salvinia* grasshopper, *Paulinia acuminata*, because it chewed on strawberry leaves during the tests, even though the chances of an aquatic grasshopper encountering

strawberries were remote. The researchers began the field test by releasing only the weevil and then periodically visited the lake to observe the results. With each successive visit, they could hardly believe their eyes. The weevils had taken to the plants and thrived. The thick carpet of *Salvinia* was noticeably diminishing.

Fourteen months after the beginning of the test, the researchers considered the infestation under control. Although the weevil did not find and kill all the plants, the populations of both organisms had reached an equilibrium. Both plants and weevils now coexisted, albeit in low numbers, in a perpetual game of hide and seek with neither organism becoming extinct.

After this initial success, the weevil was released in other *Salvinia*-infested waters throughout the Old World. It produced superb results, typically reducing the infestations by more than 99% within a year. Today, *Salvinia molesta* still causes problems, but now there's a solution. If, for example, a farmer in South Africa finds his fishpond overgrown with *Salvinia*, he can learn from the local agricultural agent how to control it.

It's unlikely that *Salvinia molesta* will ever become a weed in Europe or temperate areas of North America. Although it can tolerate regular frosts as it does at the southern limit of its range in Brazil, it is not found in waters that form ice and cannot tolerate temperatures less than -3° C for more than a few hours.

After the infestations were controlled, the entomologists, like the botanists, realized that they, too, were dealing with a new species. The evidence for this was straightforward: upon closer examination, the weevil looked and acted differently from the one found on *Salvinia auriculata*. They named the new weevil "*Cyrtogonus salviniae*" (Fig. B).

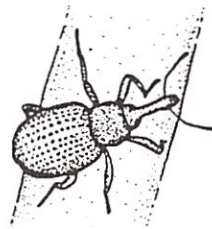


Figure B.

The hero of the story,  
a curculionid weevil,  
*Cyrtogonus salviniae*.

The researchers also learned some surprising facts about this newly christened weevil. For one thing, it is a fussy eater. Its larval and adult stages eat different parts of the plant. The larvae tunnel through the stem, demolishing the vascular system, and the adults eat the nutrient-filled buds, destroying the plant's capacity for vegetative growth. It is this one-two punch that devastates *Salvinia molesta* infestations.

Another gratifying find was that the weevils are much cheaper to use than other methods of controlling *Salvinia molesta*. In Sri Lanka, for example, using the weevil had a benefit:cost ratio, in dollars, of 53:1 (over a 25-year period), and in person-hours of labor 1673:1. In addition to these benefits, entomologists also like to point out that there have been no unwanted side effects (i.e., costs) from the biological control.

The balance of Chris Goudey's talk to the October meeting on "Australian Tree-Ferns" will be reported in the next issue of the Newsletter.



The botanists also realized an astonishing fact about the plant. In the 1970s, before the weevil was used to eradicate it, *Salvinia molesta* formed what was probably the largest and most widespread vascular-plant clone in the world, covering over 2000 square miles weighing over 20 million tons. Because it reproduced entirely by fragmenting stems, a plant of *S. molesta* from anywhere in the world--from southern Brazil to Lake Kariba to the Sepik River floodplain--was genetically identical with all others (barring any somatic mutation, of course).

*Salvinia molesta* reproduces only by fragmentation because it is sexually sterile; it cannot produce viable spores needed for sexual reproduction because the species is pentaploid, i.e., having five sets of chromosomes. During meiosis, (the type of cell division that gives rise to the spores), the fifth chromosome set does not have a corresponding set with which to pair. As a result, the chromosomes from that extra fifth set are distributed unequally to the daughter cells of meiosis, which then develop abnormally into misshapen, nonviable spores, thus destroying the possibility of sexual reproduction.

*Salvinia molesta* has several remarkable leaf adaptations that have helped it become a successful and widespread aquatic weed. One of the most important of these adaptations is its resistance to waterlogging and sinking. You can easily see this for yourself the next time you are at a botanic garden or public greenhouse. Find the indoor plant pond--they'll probably have at least one species of *Salvinia*. Try sinking the plants by pushing them beneath the water. You won't be successful. No matter how many times you submerge the plants, they immediately pop up to the surface, completely dry.

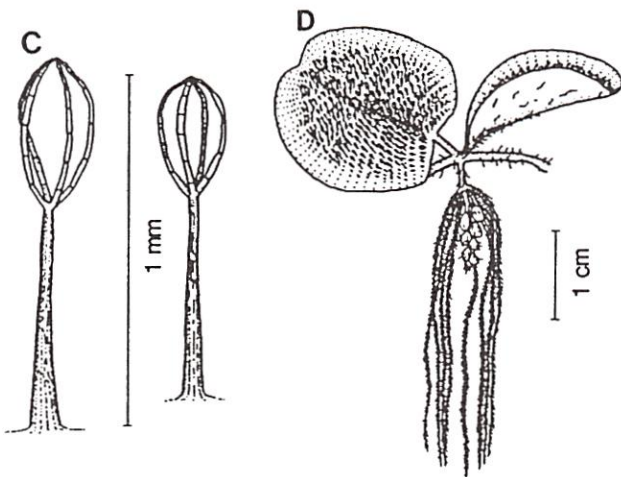


Figure C. Papillae, each with four hairs in the form of a cage or "egg beater." These structures are found on the upper surface of the floating leaves.

Figure D. Plant of *Salvinia molesta*, showing a node with three whorled leaves. The two upper leaves, which bear the "egg beater" structures, are called the "floating leaves." The lower leaf, called the "submerged leaf," resembles a root but is actually a leaf because it bears sori (the globose structures in the middle).

In *Salvinia molesta*, this unsinkability is aided by specialized hairs and papillae on the upper surface of the floating leaves. These hairs are grouped in 3s or 4s and united at their tips, forming a cage. These cages sit atop conical, 1-2 mm long stalks, called "papillae." Together, the cages and papillae resemble a cooking whisk or the beater of a kitchen mixer (Fig. C). The "egg beaters" are arranged in close rows, forming a second surface above the leaf. When the plants are submerged, this secondary surface traps the air beneath, which in turn helps buoy the plant back to the water's surface. Any water that has remained on top simply beads up on the secondary surface formed by the "egg beaters" and rolls off in shimmering, silvery drops.

Another equally odd feature of *Salvinia molesta* is its "roots." What looks like a mass of whitish or brownish roots hanging down in the water (Fig. D) is not a root at all--it's a leaf! How do botanists know this? This highly modified leaf bears sori (sometimes called "sporocarps"; Fig. D) which is something that stems and roots never do. It's hard to believe, especially because the submerged leaf is so rootlike, but *Salvinia* has no true roots!

The function of the rootlike submerged leaves has baffled botanists for a long time. No botanist has ever experimentally demonstrated that the submerged leaves absorb water and mineral nutrients as do true roots. Some think that the submerged leaves stabilize the plant by creating drag to minimize drift, and act as a weight to prevent flipping by strong winds. Whatever their function, they are certainly bizarre and unfernlike leaves.

Striking, too, is the fame the curbing of *Salvinia molesta* has earned among experts in aquatic weed control. They often cite this story as "the most outstanding example of biological control of an aquatic weed." I am particularly fond of the story because of the pivotal role played by taxonomy, my profession. If D. S. Mitchell, a taxonomist, had not discovered that the weedy *Salvinia* was a species different from *S. auriculata* and provided the clue as to where *S. molesta* grew natively, then entomologists would never have known where or on which species to look for a biological control, and we would still be plagued by a serious weed problem.

And what ever happened to the 80,000 people living in the Sepik River floodplain of Papua New Guinea? In 1983, the weevils were released there. Eight months later, the infestation was reduced from 250 km<sup>2</sup> to 2 km<sup>2</sup>, and an estimated 2 million tons of *Salvinia* were destroyed in the process. Nowadays, life in the floodplain is back to normal. The people canoe, fish, and harvest trunks of Sago Palms much as they did before *S. molesta* briefly, but dramatically, threatened their way of life.

#### Selected References

- MITCHELL, D. S. 1972. The Kariba weed: *Salvinia molesta*. *British Fern Gazette* 10: 251-252. ROOM, P. M. 1990. Ecology of a simple plant-herbivore system: biological control of *Salvinia*. *Trends in Ecology and Evolution* 5: 74-79. THOMAS, P. A. 1986. Successful control of the floating weed *Salvinia molesta* in Papua New Guinea: a useful biological invasion neutralizes a disastrous one. *Environmental Conservation* 13: 242-248. THOMAS, P. A. and ROOM, P. M. 1986. Taxonomy and control of *Salvinia molesta*. *Nature* 320: 581-584.

#### VALE

We were saddened to learn of the recent death of Gladys Gregory, wife of Mac, to whom we offer our deepest sympathy. Gladys was a long-time member of the Fern Society, she and Mac having joined in August, 1979.



Balance Sheet

As At 30th June 1992

1991 \$			1992 \$
	<u>Members Funds</u>		
22,048.97	As/1991 Balance Sheet		22,635.04
<u>586.07</u>	Surplus (Deficit)		<u>(754.64)</u>
<u>22,635.04</u>	TOTAL		<u>21,880.40</u>
	<u>Represented by</u>		
	<u>Current Assets</u>		
	<u>Cash on Hand</u>		
866.95	Book Sales	534.30	
100.00	Fern Sales/Stock	100.00	
7.90	Library	--	
<u>169.00</u>	Subscriptions	--	634.30
	<u>Cash At Bank</u>		
129.60	Book Sales - (WBC)	982.95	
2,557.78	- WBC	2,666.03	
2,774.25	Show Committee - (NAB)	536.84	
1,110.20	General A/C - (NAB)	819.34	
12,954.23	Cash Management - (NAB)	<u>14,956.81</u>	19,961.97
958.68	Stock		647.13
	<u>Fixed Assets</u>		
197.00	Library - Less Deprec'n	153.00	
<u>1,090.00</u>	Plant and Equipt.- Less Deprec'n	<u>654.00</u>	<u>807.00</u>
<u>22,915.54</u>	TOTAL ASSETS		<u>22,050.40</u>
	<u>Current Liabilities</u>		
280.50	Accrued Expenses		170.00
<u>280.50</u>	Total Liabilities		<u>170.00</u>
<u>22,635.04</u>	NET ASSETS		<u>21,880.40</u>

Statement of Income and Expenditure

For the Year Ended 30th June 1992

Show Committee

1991 \$			1992 \$
	<u>Income</u>		
1,243.60	Door Receipts	1,029.70	
2,267.71	Plant Sales/Commissions)	8,219.00	
20.26	Refreshments	<u>126.00</u>	
		9,374.70	
	<u>Less Cash Floats</u>	<u>862.00</u>	
	Net Income		8,512.70
	<u>Less - Cost of Goods Sold</u>		
	Plants	6,639.12	
	Refreshments	<u>81.66</u>	6,720.78
			1,791.92
	<u>Less - Expenses</u>		
1,204.92	Show (Inc Hall hire)		1,064.78
	Surplus from Show		727.14
	<u>Add Non Show Income</u>		
--	Bank Interest		<u>28.73</u>
			755.87
<u>32.08</u>	<u>Less - Non Show Expenses</u>		
	Bank Charges		<u>51.28</u>
<u>1,432.57</u>	SURPLUS FOR YEAR		<u>704.59</u>



General Account

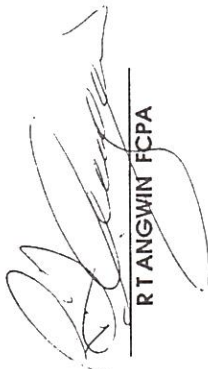
1991 \$	<u>INCOME</u>		1992 \$
2,547.50	Subscriptions - Members		2,346.50
	<u>Sales/Commissions</u>		
130.60	Spore Bank	31.50	
232.63	Commissions	219.13	
--	Wangaratta Show	<u>387.00</u>	637.63
199.80	<u>Special Efforts</u>		
	General	237.90	
	Plant Stand	<u>78.00</u>	315.90
	<u>Other Income</u>		
330.00	Advertising	370.00	
--	Returned Deposit (Otway's Tour)	150.00	
33.90	Sundry Income	<u>14.80</u>	<u>534.80</u>
			<u>3,665.83</u>
	<u>Add-Non Operating Income</u>		
1,216.19	Bank Interest		
	General A/C	22.27	
	Cash Management	<u>904.64</u>	<u>926.91</u>
<u>4,690.62</u>	<b>TOTAL INCOME</b>		<u>4,761.74</u>

1991 \$	<u>EXPENDITURE</u>		1992 \$
	<u>Newsletters</u>		
2,436.27	Printing	2,385.00	
787.11	Postage	<u>1,003.24</u>	3,388.24
	<u>Administration</u>		
	Honorariums	300.00	
35.20	Registrations/Subscriptions	140.67	
140.77	Stationery	230.00	
	Phone	27.48	
40.00	Repairs/Maintenance	136.00	
	Advertising	93.60	
	Entertainment	100.00	
189.33	Executive/Secretary	92.45	
280.50	Hall Hire	784.00	
385.00	Audit Fee	410.00	
	Society Banner	200.00	
57.80	Bank Charges	32.61	
750.00	Depreciation	480.00	
	Sundries	43.68	
110.00	Donations	--	
26.50	Library - Books	--	
39.00	- Expenses	--	
220.00	Excursion Expenses	--	
189.01	Glasses	--	
<u>231.94</u>	Show Expenses	<u>--</u>	<u>3,070.49</u>
<u>5,918.43</u>	<b>TOTAL EXPENDITURE</b>		<u>6,458.73</u>
(1,227.81)	(Deficit) General A/C		(1,696.99)
	<u>Less Surplus</u>		
1,432.57	Show Committee		704.59
<u>381.31</u>	Book Sales		<u>237.76</u>
<u>586.07</u>	<b>SURPLUS/(DEFICIT) FOR YEAR</b>		<u>(754.64)</u>

Book Sales

1991 \$			1992 \$
	<u>Operating Income</u>		
	Sales - Gross	589.60	
	Less Credits	<u>115.55</u>	
1,138.65	NET SALES	474.05	
875.32	Less - Cost of Books Sold	<u>311.55</u>	162.50
	<u>Add Non Operating Income</u>		
155.54	Bank Interest		125.73
			<u>288.23</u>
	<u>Less - Expenses</u>		
--	Postage	14.00	
37.56	Bank Charges	19.07	
	TFN Tax Withheld	<u>17.40</u>	<u>50.47</u>
<u>381.31</u>	<b>SURPLUS FOR YEAR</b>		<u>237.76</u>

I consider the Statements of Receipts and Payments and Balance Sheet reflects a true and proper view of the financial operations of the Society for the year and reflects the state of affairs at 30th June 1992.

  
**R T ANGWIN FCPA**

**AUDITOR'S REPORT**

I have examined the books of account and associated records of the Fern Society of Victoria Inc for the year ended 30th June 1992 and have been provided with all the information and explanations required.



SPORE LIST

Ordering: The following spore is free to those who donate spore. Otherwise, members 20 cents each sample, non-members 50 cents, plus \$1.00 to cover p. and p.. Available at meetings or by mail from Barry White, 24 Ruby St, West Essendon, Vic. 3040. - Ph. (03) 337 9793. There is no charge to overseas members, but to cover postage two International Reply Coupons would be appreciated. A booklet on spore collection and cultivation is available for 40 cents, or free to spore donors.

ADIANTUM concinnum 3/92	DRYOPTERIS atrata 11/92
ADIANTUM formosum 7/91	DRYOPTERIS erythrosora 1/92
ADIANTUM fournieri 3/91	DRYOPTERIS guanchica /91
ADIANTUM raddianum 'Blue Moon' 4/91	DRYOPTERIS hondoensis 11/92
ADIANTUM raddianum 'Gracillimum' 1/91	DRYOPTERIS inaequalis 4/91
ADIANTUM raddianum 'Grandiceps' 1/91	DRYOPTERIS sieboldii 12/91
ADIANTUM raddianum 'Legrand Morgan' 3/91	HYPOLEPIS glandulifera (punctata) 11/92
ADIANTUM raddianum 'Pacific Maid' 1/91	HYPOLEPIS punctata 1/92
ADIANTUM raddianum 'Variegata Tessellate' 1/91	LASTREOPSIS hispida 3/92
ADIANTUM raddianum 'Victoria's Elegans' 1/91	LASTREOPSIS hispida 6/92
ADIANTUM raddianum 'Weigandii' 3/92	LASTREOPSIS tinerooensis 2/91
ADIANTUM whitei 3/92	LYGODIUM microphyllum 7/91
AGLAOMORPHA meyeniana 2/91	MACROTHELPTERIS torresiana 1/92
ALSOPHILA capensis 4/91	MICROSORUM parksii 8/91
ANEMIA mexicana 7/91	NIPHIDIUM crassifolium 5/92
ANEMIA phyllitidis 7/91	OSMUNDA schraderi cv contorta 3/92
ASPLENIUM milnei 4/92	PELLAEA cordifolia 6/92
ATHYRIUM filix femina 1/92	PELLAEA falcata 11/92
ATHYRIUM niponicum v. pictum 3/92	PELLAEA hastata 2/92
ATHYRIUM nipponicum pictum crested /91	PELLAEA quadripinnata 4/91
ATHYRIUM nipponicum pictum, large form /91	PELLAEA viridis v. macrophylla 2/92
BLECHNUM braziliense 6/92	PITYROGRAMMA calomelanos v. aureoflava 7/92
BLECHNUM cartilagineum 1/92	PLATYCERIUM alcicorne 4/91
BLECHNUM chambersii 10/92	PLATYCERIUM elephantotis 10/91
BLECHNUM discolor 6/92	PLATYCERIUM stemmaria 5/91
BLECHNUM fluviatile 10/92	PLATYCERIUM superbum 7/91
BLECHNUM gibbum 1/92	PLATYCERIUM wallichii 4/91
BLECHNUM minus 6/92	PNEUMATOPTERIS pennigera 3/92
BLECHNUM nudum 10/92	POLYPODIUM formosum 8/91
BLECHNUM sp. (Philippines) 1/92	POLYSTICHUM acrostichoides 4/92
BLECHNUM wattsi 10/92	POLYSTICHUM braunii /91
CONIOGRAMME intermedia 1/92	POLYSTICHUM fallax 7/91
CTENITIS languinosa 4/91	POLYSTICHUM formosum 3/92
CYATHEA australis 4/92	POLYSTICHUM munitum 6/92
CYATHEA brownii 3/92	POLYSTICHUM onocolobatum 7/91
CYATHEA cooperi 10/92	POLYSTICHUM proliferum 11/92
CYATHEA dealbata 2/92	POLYSTICHUM retroso-paleaceum 10/92
CYATHEA howeana 10/92	POLYSTICHUM setiferum 'Divisilobum' /91
CYATHEA medullaris 5/91	POLYSTICHUM setiferum cv. 3/91
CYATHEA robertsiana 3/92	POLYSTICHUM tsus-simense 3/92
CYATHEA smithii /91	POLYSTICHUM whitelegii 12/91
CYATHEA tomentosissima 5/92	PTERIS cretica 'Parkeri' 3/91
CYATHEA woolsiana 3/91	PTERIS dentata 6/92
CYRTOMIUM caryotideum 3/91	PTERIS ensiformis 'Victoriae' 3/91
CYRTOMIUM falcatum 3/92	PTERIS hendersonii 1/92
DICKSONIA antarctica 3/92	PTERIS quadriaurita 'Argyraea' 10/92
DICKSONIA herbertii 10/92	PTERIS semipinnata 3/91
DICKSONIA sellowiana 10/92	PTERIS umbrosa 7/91
DICKSONIA youngiae 10/92	RUMOHRA adiantiformis (native) 4/92
DIPLAZIUM centripetale 2/92	RUMOHRA adiantiformis (S.Africa) 3/92
DIPLAZIUM dilatatum 2/91	SADLERIA cyatheoides 10/92
DOODIA aspera 1/92	SADLERIA pallida 7/91
DORYOPTERIS pedata 6/92	STENOCHLAENA tenuifolia /91
DRYOPTERIS affinis 'Polydactyla' /91	STICHERUS lobatus 6/92



FERNS OF FIJI (continued)

(from p.124) A memorable visit was made to a very large orchid farm owned by Raymund Burr of screen fame. Here the vast numbers of exotic orchids were interspersed by Adiantums growing everywhere and some magnificent examples of *Nephrolepis*, including *N. falcata* var. *furcans*.

A huge plant of a *Goniophlebium* was seen in the Botanic Gardens where numerous *Adiantum trapeziforme* were growing in the ground in gardens with other plants. *Adiantum capillus-veneris* grew rampantly in every available crevice on banks around the town.

Other activities included a visit to a coral reef on a glass-bottomed boat and one to a Fijian village, where they took part in the kava ceremony, saw the husking of coconuts with a wooden spike, sampled green coconut milk and saw the rapid making of hats and other articles from palm leaves.

The presentation concluded with enthusiastic applause to endorse President Barry White's thanks to Mary for a most entertaining and informative presentation.

---oo000oo---

FERN COMPETITION

The category for the fern competition at the November meeting was a *Polystichum*. Congratulations to Dorothy Forte who won all three prizes with specimens of *Polystichum salvaticum*, a cultivar of *P. setiferum* or *P. aculeatum*, and *P. setiferum* 'Plumosa'.

---oo000oo---

SPECIAL EFFORT WINNERSNovember General Meeting

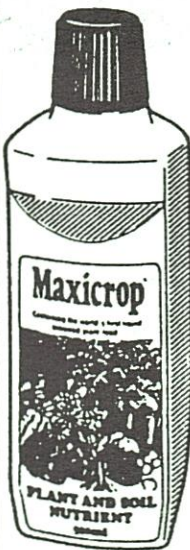
Norma Hodges

Margaret Radley (2)

Mary Frost

John Hodges

\* \* \* \* \*



## Maxicrop

"Goodness from the sea"

- \* Contains over 60 elements and minerals
- \* Safe and easy to use.
- \* Made from fresh growing seaweed.
- \* Ideally suited for ferns
- \* Maxicrop is available from nurseries and other places where garden products are sold.

### Maxicrop

4/375 Bayswater Rd., Bayswater. Vic. 3153.  
P.O. BOX 302, Bayswater, Vic. 3153. Tel. Melb. (03) 720 2200

Opinions expressed in articles in this Newsletter are the personal views of the author and are not necessarily endorsed by the Society.



## BUYERS' GUIDE TO NURSERIES

### VICTORIA:

Andrew's Fern Nursery - Wholesale and Retail.  
Melbourne Road, Arcadia, 3613. Ph: (058) 26 7285.  
Large range of ferns for beginners and collectors.  
Open daily 10 am - 5 pm except Christmas Day.

Austral Ferns - Wholesale Propagators. Ph: (052) 82 3084.  
Specialising in supplying retail nurseries with a wide range of hardy ferns; no tubes.

Dingley Fern Market - Wholesale and Retail. Ph: (03) 551 1868.  
233 Centre Dandenong Road, Dingley, 3172.  
Specialising in Ferns, Palms, Indoor Plants, Orchids and Carnivorous Plants. Open daily except Christmas Day.

Fern Acres Nursery - Retail.  
Kinglake West, 3757. Ph: (057) 86 5481.  
(On main road, opposite Kinglake West Primary School).  
Specialising in Stags, Elks and Bird's-nest Ferns.

Fern Glen - Wholesale and Retail. Visitors welcome.  
D. & I. Forte, Garfield North, 3814. Ph: (056) 29 2375.

R. & M. Fletcher's Fern Nursery - Retail.  
62 Walker Road, Seville, 3139. Ph: (059) 64 4680.  
(Look for sign on Warburton Highway, 300m east of Seville shopping centre). Closed Tuesday, except on public holidays.

Ridge Road Fernery - Wholesale and Retail.  
Weeaprounah, 3237. Ph: (052) 35 9383.  
Specialising in Otway native ferns.

Viewhaven Nursery - Wholesale and Retail.  
Avon Road, Avonsleigh (near Emerald), 3782. Ph: (059) 68 4282  
Specialists in Stags, Elks, Bird's-nests and Native Orchids.

### NEW SOUTH WALES:

Jim & Beryl Geekie Fern Nursery - Retail. By appointment.  
6 Nelson Street, Thornleigh, 2120. Ph: (02) 484 2684.

Kanerley Fern Exhibition and Nursery - Wholesale and Retail.  
204 Hinton Road, Nelsons Plains, via Raymond Terrace, 2324.  
Ph: (049) 87 2781. Closed Thursdays and Saturdays.  
Groups of more than 10 must book in advance, please.

Marley's Ferns - Retail.  
5 Seaview Street, Mt. Kuring-gai, 2080. Ph: (02) 457 9168.

### QUEENSLAND:

Moran's Highway Nursery - Wholesale and Retail.  
Bruce Highway, Woombye (1 km north of Big Pineapple; turn right into Keil Mountain Road). P.O. Box 47, Woombye, 4559. Ph: (074) 42 1613.