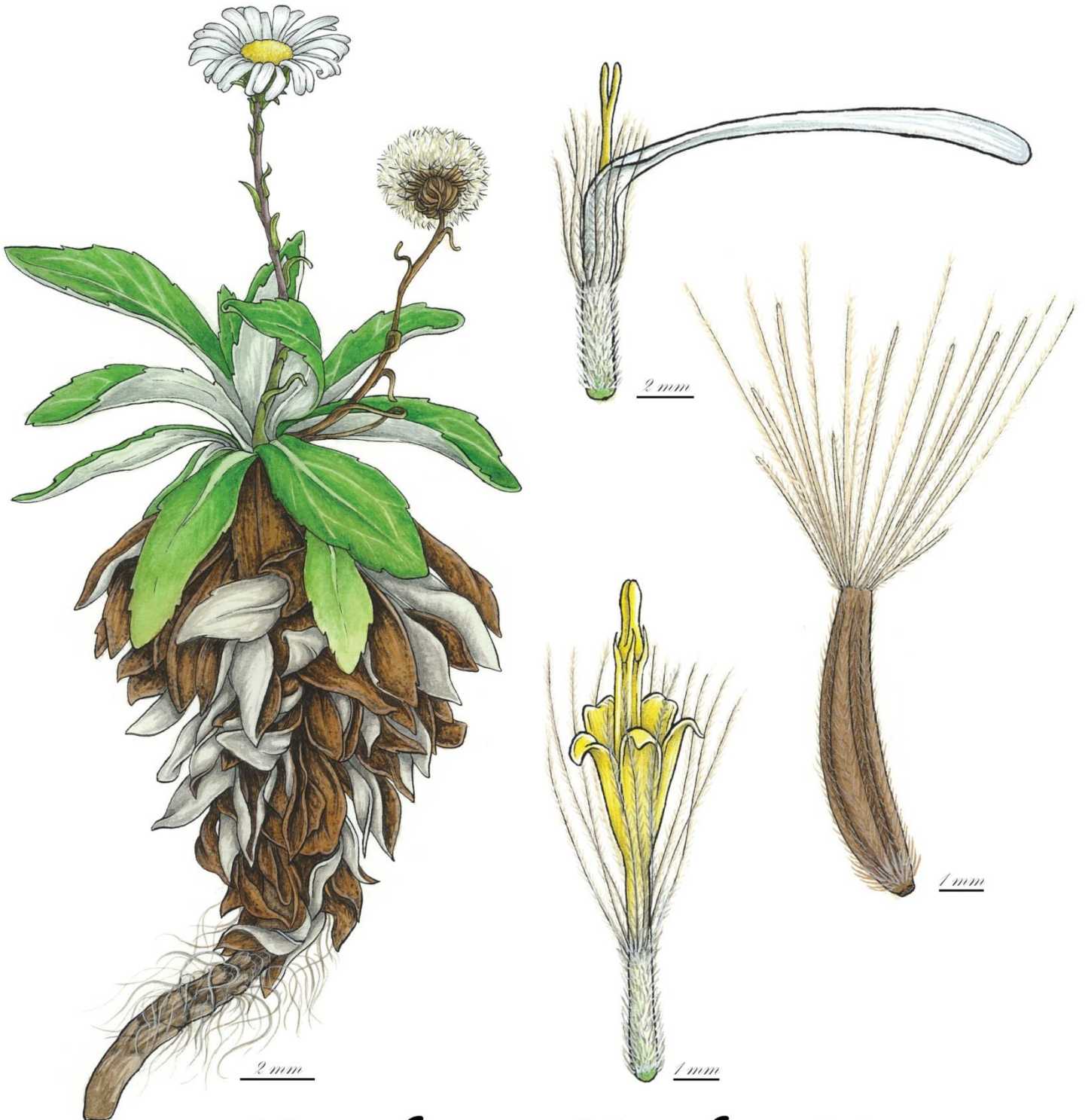




BOTANICAL SOCIETY

OF OTAGO



Newsletter Number 84
May 2018



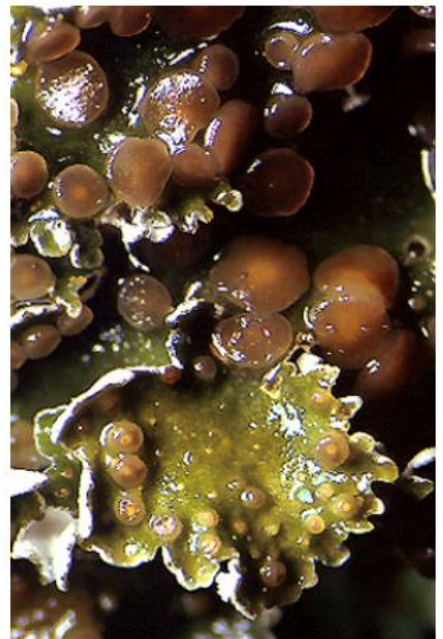
New Zealand Lichens

by Bill and Nancy Malcolm, 2018, Micro-Optics Press

Fungi can't make their own food, but nonetheless they thrive because they've evolved reliable ways of getting food from other creatures by what we humans call theft and barter. Some of them take on algal and/or bacterial partners that can make food by trapping sunlight. That "life style" is called a lichen. This book explains how a lichen's partners interact, shows what lichens look like on the outside and how they're built on the inside, and recounts the bizarre uses that they've been put to over the centuries.

307 pages, illustrated with more than 700 colour photographs, microscope views, drawings, and diagrams.

Price NZ\$69 (includes GST and shipping inside New Zealand). Order from Bill by **e-mail** at nancym@micro-optics-press.com or by **post** at P.O. Box 320, Nelson 7040, or by **phone** at 03-545-1660. Payment options PayPal or direct credit.



BSO Meetings and Field Trips June-December 2018

Saturday 9th June, 9.00 am: Visit to Pā Harakeke at Orokonui Ecosanctuary. This is a chance to get to know the extensive collection of harakeke at Orokonui with Sue Hensley. We will spend the morning learning about the harakeke and getting our hands dirty with a bit of weeding and cleaning. In addition, there will be a chance to see the Otago Rare Plants garden (which many of our members have contributed to) and perhaps spy a takahe or tuatara. Meet at Botany Department carpark at 9am. Contact Gretchen Brownstein 021 065 8497 or brownsteing@landcareresearch.co.nz.

Wednesday 13th June, 5.20 pm: Conservation genetics and ecology of *Hardenbergia violacea*. Speaker: Dr Matthew Larcombe, Department of Botany, University of Otago. Although first recorded in the early 1800s, there have always been questions about the native status of *Hardenbergia violacea* in Tasmania. The only putative native population occurs near Hobart, and some suspect it was an early introduction from mainland Australia, while others believe it is native. Matt will describe a study that aimed to settle this debate. It involves some detective work, CSI style DNA analysis, and a beautiful little plant. Matt works in the Department of Botany at the University of Otago. His current work focuses on how ecology shapes the evolution of lineages and how that in turn shapes patterns of biodiversity at global scales.

Wednesday 18th July, 5.20 pm: The vision of a Pest-Free Peninsula. Speaker: Rod Morris is current chairman of the Otago Peninsula Biodiversity Group (OPBG), a community led conservation initiative to control animal pests on Otago Peninsula to make the area a better place for people and native wildlife. He will talk about reclaiming the biodiversity values of the Otago Peninsula, and how OPBG are promoting and enhancing these values through predator control. Since 2011, the OPBG has removed 14,500 possums from Otago Peninsula and as a result several native bird species are increasing in abundance and spread, including korimako, tui and kereru. In addition to this, monitoring of forest remnants and reptile and invertebrate numbers should begin to document other signs of recovery. This growing achievement is thanks to the concerted effort of an increasing number of volunteers - the backbone of this initiative - ably guided by staff, and assisted by funders and supporters.

The next five years will be crucial in eradicating possums. Already Government and local bodies are showing an interest in supporting the final drive for eradication, as part of the Predator Free NZ vision. We are already preparing for the return of native species such as falcon, morepork and kaka, as well as looking to the next animal pest or pests that need targeting. Peninsula residents are concerned about the presence of ship rats, mustelids, rabbits, hedgehogs and feral cats as the possum project gathers support and momentum! However as the talk demonstrates, this is not about killing possums, it's about reclaiming our natural biodiversity. So... prepare to meet a suite of 'new' neighbours heading our way...

...karearea has already arrived on the Peninsula, kaka is an occasional and itinerant visitor from Orokonui, and ruru is already across the harbour, is getting closer and already visits the town belt.

Saturday 28th July, 2-4.30pm. Joint BSO/Botany Dept. close-up photography workshop. This is a friendly gathering for learners and experts alike and the aim is to share, learn and pass on tips and techniques for botanical macro- and micro-photography. Bring your smart phones, compact or fancy cameras, tripods, hand-lens, macro lenses, microscopes, external lighting or any other aids to

photographing fascinating botanical details that you'd like to learn more or share tips about. Also bring any small flowers, fungi, leaves, liverworts, lichens or other botanical specimens suitable for taking close-up photos. Meet in the Upstairs lab, Department of Botany, 464 Great King St. Register by Thursday 26th July. Contact Allison Knight, 027 4878 265.

Wednesday 8th August, 5.20 pm: Botanical experiences in the South. Speaker: Lloyd Esler inherited his botanical interest from his father Alan in Palmerston North. They explored the sand country, Tararua foothills and patches of bush across the Manawatu area. Later, in Auckland, it was the Waitakeres, West coast beaches and Hauraki Gulf islands. He studied botany at Otago University – JB Wilson, Alan Mark, Brenda Shore and Geoff Baylis are the characters he remembers. In Southland he is the chairman of the Fieldclub and involved with habitat restoration, tour groups and school fieldtrips where aspects of botany come up all the time – seaweed balls on the beach, drinking tutu juice, eating miro berries, toadstool hunts in the park and monitoring permanent plots in plantation forests.

Saturday 25th August, Saturday 25th August, 9.00 am: Sullivans Dam. Sullivans Dam was originally constructed as a reservoir to supply Dunedin with water. It is situated north of the city just below Leith Saddle and can be reached via the northern motorway or the old Leith Valley Road. There is an easy loop track around the dam and a second track heads up through an area of native forest and eventually reaches the summit of Mt Cargill. We will go to Sullivans Dam and explore the surrounding forest which contains extensive stands of *Libocedrus*. Meet at the Botany Department carpark 9am. Contact David Lyttle (03) 454 5470 email djl1yttle@gmail.com

Saturday 15th September, 9.00 am: Swampy Spur Wetland via Burns and Rustler Ridge Tracks. Is it a mire or is it a bog? Or is it a bit of both? As well as looking at the vegetation on the eastern slopes of Swampy Summit, this trip will look at a significant wetland located on the flanks of Swampy Spur. Wetlands such as this one were common in pre European times. Sadly, this is no longer the case and mires and bogs now only occupy a fraction of the area they once did. The trip will follow the Burns – Rustler Ridge tracks. Meet at the Botany Department carpark 9am. Contact Robyn Bridges 021 235 8997/472 7330

Wednesday 26th September, 6pm: 17th Annual Geoff Baylis Lecture: Reweaving species: the key role of mutualisms in ecological restoration. Speaker: Janice Lord, Department of Botany, University of Otago. Location: Castle 1, University of Otago (drinks and nibbles starting from 5.15 pm in the concourse).

Recent years have seen native restoration and replanting projects popping up like mushrooms across the New Zealand landscape. Often the same suite of plants are used – *Pittosporum*, *Cordyline*, *Phormium*, *Coprosma*, *Hebe* – because they are easy to propagate and grow rapidly. But are we aiming too low? This talk will pull together current understanding of native plant mutualisms above and below ground, and ask how we can use this knowledge practically to move towards functional restoration of complex ecosystems.

Saturday 6th October, 8.30 am: Field trip to 'Dogwood' at Kuri Bush. Dogwood at Kuri Bush is a c.5ha remnant of mixed podocarp-broadleaf forest in a steep-sided gully on private land. It is in the process of being considered for a QEII covenant and one of the aims of this field trip is to contribute to a growing species list for the QEII report. The lower part of the gully at 20-30m above sea level is a kanuka-totara open forest with abundant lichens. Stock had access to this area up until c.15 years ago but

regeneration is good. The highest point is 40m above sea level and the middle and upper areas have been fenced from stock for c.30 years or more. The size of many matai and totara trees suggests that core areas have never been cleared or logged completely. The gully itself contains typical species such as *Fuchsia excorticata*, *Griselinia littoralis* and tree ferns, but the slopes support less common dry forest with *Hoheria angustifolia*, *Streblus heterophyllus* and *Lophomyrtus obcordata*. Two orchid species are relatively common – *Pterostylis graminea* and *Corybas trilobus* - and so far more than 20 species of ferns have been found. Bryophytes, lichens and fungi have not yet been explored. Birdlife is abundant with not only kahu, tui, bellbird, kereru, grey warbler and silvereyes but also shining cuckoo, the occasional falcon and possibly little owls. The stream is rumoured to contain koura but this has not yet been verified. Banded kokopu occur in a side catchment. Access is via adjacent paddocks and a narrow track that follows the stream up until the mid-section. Access to the interior of the upper area is via a marked route which involves some steep sections and stepping over obstacles. Good footwear is essential. For people not inclined to scrambling, many species including dwarf mistletoe and orchids can be seen from the margins. Field trippers are invited to stop for a hot drink at the house after the expedition. Meet at Botany Dept 8.30 am to carpool or on-site at 9.10 am. (see location map on website) Rain date Sunday 7 October. Contact Janice Lord phone 029 4881900. See NatureWatch for a current local species list: <http://inaturalist.nz/lists/848636-Kuri-Bush>

Wednesday 10th October, 5.20 pm: Were native plants on settler's farms in southern New Zealand used or abused? Speaker: Peter Holland, Emeritus Professor, Department of Geography, University of Otago. By 1900, European settlers had transformed the terrestrial vegetation cover of the southern New Zealand lowlands. The extensive tussock, shrub and fern lands, with large and small expanses of closed canopy forest and wetland in depressions had almost disappeared, and in their place was a geometrical mosaic of crop land, improved pastures, hedges and shelter belts with a smattering of native plants and remnants of once extensive native ecosystems. Did anyone express concern about what was happening to native species and ecosystems in the south, and were landholders indifferent to native plants? With information from official reports, contemporary newspaper articles, and entries in late 19th and early 20th century farm diaries I shall show that settlers valued such woody plants as broadleaf, kowhai, and totara, and were reliant on forest remnants and shrublands to shelter and sustain livestock when feed was in short supply. At the same time, many settlers were draining wetlands, burning tussock, and clearing wooded and shrubby areas on their properties, despite what they could read in their newspapers about the national importance of conserving large and small areas of native vegetation. Did early settlers use or abuse native plants and ecosystems? The answer is more complex than many of us might believe.

Entries for the biennial Audrey Eagle Botanical Drawing Competition will be displayed and the prize winners announced at this meeting.

Friday 9th November - Sunday 11th November 2018. Weekend field trip to Southland. We're still in the early stages of planning this trip but wanted to ensure you put this date in your diaries early. We'll probably camp somewhere for two nights and be led by some of our Southland-based members to their favourite spots. Full details will be provided in the next newsletter. Contact John Barkla jbarkla@doc.govt.nz

Wednesday 14th November, 5.20 pm: Native Plants are vital to Nationhood not just 'nice to have, optional extras'. Speaker: Colin D Meurk, Manaaki Whenua – Landcare Research. New Zealand is a biodiversity hotspot, but sadly also an extinction capital. Part of the excruciating extinction process is

‘extinction of experience’. We haven’t, so far, lost many plant species, but we are rapidly losing the experience as the visible cultural landscape is gobbled up by industrial agriculture, forestry and wilding trees and shrubs without any sensitivity to the unique history of Aotearoa-New Zealand. And with that goes identification with, and protectiveness towards, our special highly endemic nature. Extinction of species and geographic variants will not be far behind unless we reverse the root causes of this attrition.

Colin will illustrate key concepts, causes and novel opportunities in loss and recovery of our flora through urban and rural landscapes where most people form their notions of naturalness. It is there where visibility of biodiversity is a key ingredient of our resident sense of place and of the primeval, clean green brand essential to an authentic tourist industry. He will discuss the urgency of protecting the rarest dryland ecosystems of eastern South Island, their controversial management, biosecurity control, restoration of habitat and of landscape connectivity, novel recombinant ecosystems for urban environments (perhaps the last chance for rare lowland species), heritage legibility and ecological literacy through citizen science within an emerging nationhood. These latter ideas are not new, although the level of urgency and the terminology may not be quite what Leonard Cockayne used a hundred years ago! You are invited to compare notes on the state of our flora and how we can mend and rebuild its presence in our places and in our consciousness.

Saturday 1st December - Sunday 2nd December 2018. Weekend field trip to Oteake Conservation Park. We’re still in the early stages of planning this trip but wanted to ensure you put this date in your diaries early. We plan to stay at the DOC Homestead Camp Site on the Hawkdun Runs Road. This is a basic site and tents are required. Full details will be provided in the next newsletter.

Meeting details: Talks are usually on Wednesday evening starting at 5.20 pm with drinks and nibbles (gold coin donation), unless otherwise advertised. Venue is the Zoology Benham Building, 346 Great King Street, behind the Zoology car park by the old Captain Cook Hotel. Please use the main entrance of the Benham Building to enter and go to the Benham Seminar Room, Room 215, located on the second floor. Please be prompt as we have to hold the door open. Items of botanical interest for our buy, sell and share table are always appreciated. When enough people are feeling sociable we go to dinner afterwards: everyone is welcome to join in. The talks usually finish around 6.30 pm. Keen discussion might continue till 7 pm.

Field trip details: Field trips leave from Botany car park 464 Great King Street unless otherwise advertised. Meet there to car pool (10c/km/passenger to be paid to the driver, please). Please contact the trip leader before Friday for trips with special transport and by Wednesday for full weekend trips. A hand lens and field guides always add to the interest. It is the responsibility of each person to stay in contact with the group and to bring sufficient food, drink and outdoor gear to cope with changeable weather conditions. Bring appropriate personal medication, including anti-histamine for allergies. Note trip guidelines on the BSO web site: <http://www.otago.ac.nz/botany/bso>

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Cover: *Celmisia lindsayi*, clockwise from left: habit, ray floret, achene, disc floret. Original artwork by Sharon Jones. First prize winner in the Audrey Eagle Botanical Drawing Competition 2012. Medium: watercolour.

Chair's Notes

David Lyttle

I am not going to spend a lot of time reviewing the programme of the past year; it has been adequately covered in the Chairman's Notes and trip and meeting reports in the BSO newsletters. However I would like to mention four events that illustrate some of the activities BSO is engaged in.

The 2017 Geoff Baylis Lecture was delivered by Dr Susan Walker, an ecologist with Manaaki Whenua-Landcare Research in Dunedin. Susan has the gift of presenting complex scientific data in a clear and intelligible manner. Susan's topic "Living in the rainshadow; New Zealand's most distinctive and threatened ecosystems" was very timely considering the present dire state of this rapidly disappearing biome.

In October 2017 we conducted a field trip to Flat Top Hill near Alexandra. The turnout of over thirty people, many of whom were Central Otago locals belonging to organisations other than BSO, exceeded our expectations. There is clearly a desire for people living in the area to learn about their local flora. If we were to conduct another field trip in Central Otago where local groups were invited, more planning and structure would be needed rather than our usual informal approach to these excursions.

Our December weekend field trip to Waikaia Valley and Piano Flat proved very popular. It is very encouraging to see many of the younger members of the society participating in these weekend camps and learning botanical identification skills. On this and another trip I noticed people sketching plants in the field. In this digital age it is gratifying to know the art of botanical illustration is not dead and augurs well for the Audrey Eagle Botanical Drawing competition this year.

During a further weekend field trip to Northern Southland in February this year we visited a Landcorp QEII covenant on the foothills of the Takitimu Mountains, a second covenant on the Meridian Energy White Hill wind farm and a third site on private land at Castle Downs. We are indebted to Jesse Bythell the local QEII representative for arranging these visits and to Brian

Rance for sharing his local botanical knowledge with us.

As a Botanical Society we must aim to present a diverse and interesting programme to keep our membership engaged. In these times, when all manner clubs and groups struggle to retain members, this is vital to our survival as our only source of income is our annual subscriptions. Please continue to support the BSO by keeping your membership up to date and recruiting your friends to join as well. Through open events such as the annual Geoff Baylis Lecture, organised in conjunction with the Botany Department of the University of Otago, advances in both botanical science and the scientific underpinning of environmental issues can be presented to the public. This public engagement is an important part of our activities. The Committee puts a lot of thought into choosing speakers and topics for this and other events. Field trips to places beyond Dunedin provide opportunities to interact with other people and organisations; not only can we bring our own expertise but we can learn much about the plants and places from the people who are familiar with the areas visited and have intimate knowledge of the plants found there.

Thanks are due to Allison Knight for her work as secretary and Mary Anne Miller as treasurer. I would like thank Kate Caldwell for her sterling efforts in producing our flagship triannual newsletter. It is a challenging job and widely appreciated. Special thanks are due to Esther Dale and her helpers for producing the brilliant series of botanical pun badges which have been a runaway success. I would also like to acknowledge the contributions of every Committee member for all their hard work on behalf of the Society during the year; Robyn Bridges, Gretchen Brownstein, David Orlovich, John Barkla, Tina Summerfield, John Steel, Ian Geary, Lydia Turley and Bridget Thomas.

Secretary's Notes

Allison Knight

I've just written up the minutes of the AGM, chaired in a record 5 minutes by our new Chairman Gretchen Brownstein. There has been quite a changing of the guard and the new committee is raring to go. We'd

really appreciate your suggestions for talks, trips or other activities – our email addresses are on the back page of the newsletter. There were 47 entries in the annual Photo Competition, of such a high standard that the judges had trouble deciding on the winning images. As usual, the members' choice picked an image that the judges had overlooked. The audience was not as large as usual, possibly because several members, and one of the usual judges were away at the Fungal Foray. Perhaps we should change the event to June and have a mid-winter feast of pot-luck food and photography. Can anyone suggest a suitable venue for such an event? Following on from the field photography course in April and the photo competition in May, where several innovative close-up images caught the eye, there will be a joint BSO/Botany Department close-up photography workshop in the upstairs Botany lab in July. Come along and hone your skills and pass on your photographic tips.

Several more events to look forward to over the next two years have come through our mailbox. The organisers of the John Child Bryophyte and Lichen Workshop have sent a notice inviting members to the annual meeting to be held at Pureora in November this year. Thanks to DOC, accommodation will be free! Another interesting letter to cross my desk recently was one from the Swedish Consul Dan O'Leary (see Correspondence section). He points out that next year is the 250th anniversary of Captain Cook bringing Swedish Botanist Daniel Solander to New Zealand. It is also the 150th anniversary of Otago University, more than 150 years since the Dunedin Botanic Garden was established and the 95th Anniversary of the Department of Botany. Dan is keen for all these organisations to get together to celebrate the contribution of Solander to the botany of New Zealand. We are privileged that the Swedish Ambassador, Par Ahlberger, has agreed to come and talk to BSO about Solander next year. Looking even further ahead, the Canterbury Botanical Society is planning a summer trip based at Bannockburn in January 2020. Look for more details in our February newsletter.

The latest issue of Pipipi, the Hinewai Reserve Newsletter came with illustrations in colour. Coincidentally, Bill Malcolm, whose fabulous

revision of Lichens of New Zealand is reviewed here, has offered to help us print our own newsletter in colour. This will be great for showcasing the winning entry in the photo competition and other photos and the beautiful botanical drawings of Sharon Jones. I hope you enjoy it!

Editor's Notes

Lydia Turley and Sharon Jones

Many thanks to everyone who has contributed to this edition of the newsletter – it's exciting to see so much packed into this edition! It's also exciting to have the newsletter printed partly in colour – many thanks to Bill Malcolm for helping with the cost of that. Check out the ad for his new lichen book (in full colour) on page 2.

Kate, who has been our fantastic newsletter editor for some time, has decided to take a break from the committee and newsletter. She's done an amazing job and left big shoes to be filled, and I'd like to thank her for all her work, and her help in putting together this newsletter. Please note that we have new editors, and thus a new person to send contributions to.

Suggestions and material for the newsletter are always welcome from our members. If you are keen to submit stories, drawings, reviews, opinions, articles, photos or letters – or anything else you think might be of botanical interest to our diverse range of members, don't hesitate to get in touch. Send your feedback, comments or contributions to lydiamturley@gmail.com. Copy for the next newsletter is due on *10 September 2018*. Earlier submissions are most welcome.

Editor's guidelines: Try to aim for a 0.5–1 page of 14 pt. Times for news, trip/meeting reports and book reviews and 1–5 pages, including illustrations, for other articles. Electronic submission by email to lydiamturley@gmail.com is preferred. Send photos as separate files and remember to include photo captions and credits.

Disclaimer: The views published in this newsletter reflect the views of the individual authors and are not necessarily the views of the Botanical Society of Otago.

Treasurer's Notes

Mary Anne Miller

Statement of financial position

CAPITAL	<u>2018</u>	<u>2017</u>
<u>Current Assets</u>	\$	\$
Non Profit Everyday Account	3,650.84	3,591.24
Bonus Saver Account – AEP Fund	11,181.60	10,936.69
Business Online Saver Account	8,076.96	7,340.34
Accounts receivable	530.65	0.00
Inventory – publications	60.00	80.00
Petty Cash	2.80	2.80
Float for cash sales	10.00	24.00
<u>Current Liabilities</u>		
Sundry Payables	-48.98	0.00
Subscriptions in Advance	0.00	-70.00
<u>Working Capital</u>	23,463.87	21,905.07
 Membership:		
General	26	51
Student	1	11
Total paying members	27	62
Life Members	2	2
Complementary newsletters - libraries & allied societies	24	10
TOTAL newsletters distributed	53	74

Please note that membership has gone up since this report was prepared as several people paid their subs after the end of the financial year.

New Members

A warm welcome is extended to Angelina Young, Stephanie Sinton, Penelope Gillette, E. Parkyn and Catriona Gower. To our existing members, thank you for your continuing support.

Thank you very much to Toni Wilson and Gaye Robertson for their generous donations.



Sophora leaves unfurling (Photo: Catriona Gower)

Correspondence and News

250th Anniversary of Solander's arrival in New Zealand

22 April 2018

Dear Botanical Society of Otago, Science Division and Department of Botany, University of Otago and Dunedin Botanic Garden

I am the Honorary Consul of Sweden, based in Wellington.

Please excuse the joint email, I thought it might be best if I communicated with all of you together at the one time.

The Embassy of Sweden (in Canberra) has asked me to contact you to find out if you have any plans to commemorate in 2019 the 250th anniversary of Cook's first arrival in New Zealand in 1769 in terms

of Swedish botanist Daniel Solander's important presence on that expedition.

The Embassy is aware of the Solander Plant Trail in the Botanic Garden opened in 2007 and further understands the University's Department of Botany will celebrate its 95th anniversary next year, as the University itself will celebrate its own 150th anniversary. I also understand the Department included in its 90th anniversary celebrations a display of Solander's *Primitiae Florae Novae Zealandiae* (1770), the first European documentation of flora in New Zealand.

The Ambassador of Sweden, Par Ahlberger, would be delighted to visit you to discuss how to acknowledge Daniel Solander in 2019 and would be available for any such meetings on Monday 10 September next if that were suitable.

I look forward to your response.

Kind Rgds

Dan O'Leary

Honorary Consul of Sweden

8 May 2018

Dear Allison

Thank you for your reply.

The Ambassador advises he would be delighted to give an evening talk on Solander and suggests we plan for this to take place in the first half of 2019.

He will visit Dunedin on 10 September 2018, but is unlikely to stay overnight in view of other NZ commitments that week. He would be grateful for an opportunity to visit the Botanic Garden on 10 September 2018 and to meet with representatives of all relevant institutions to further discuss the 250th commemoration in 2019.

Kind Rgds

Dan O'Leary

Honorary Consul of Sweden

Peter Bannister Student Field Grant: Call for Applications

Applications are invited for a grant from the Peter Bannister Student Field Grant Fund to assist those enrolled for a PhD, MSc, BSc (Hons) or PGDip at the University of Otago and whose thesis deals with some aspect of botany.

The research project to be supported will be chosen on the basis of appropriateness to the objectives of the Society, namely to encourage the study and knowledge of botany. The grant will be administered through a supervisor's University of Otago account.

The grant is for fieldwork related expenses. It will not support equipment purchases or attending conferences.

Closing date for applications is **18 August 2018**.

A copy of the application form and rules may be downloaded from the Botanical Society of Otago website:

<http://www.otago.ac.nz/botany/bsopbfund.php>

Contact for enquiries:

PBSFG Administrator
Botanical Society of Otago
P O Box 6214
North Dunedin, 9059
New Zealand
or email: bsopbfund@botany.otago.ac.nz

John Child Bryophyte and Lichen Workshop Pureora 8th – 13th Nov 2018

This year's workshop will be held at the Pureora forest lodge and DOC are providing free accommodation there! The workshop is open to anyone and everyone with an interest in the mosses, liverworts, and lichens of New Zealand, from beginner to expert. There is a prize, the Tom Moss Award, which is open to any student studying any aspect of Australasian bryophytes and/or lichens. See <http://www.wellingtonbotsoc.org.nz/awards/moss.html> for details. A student from Otago, Ian Geary, won it last year. See article in this BSO newsletter for more details. For further details of this year's November workshop email Dhahara Ranatunga, dranatunga@aucklandmuseum.com

Jubilee Award 2018—Applications sought

The Wellington Botanical Society invites applications for an Award of up to \$2,600 to encourage and assist applicants to increase knowledge of New Zealand's indigenous flora, and to commemorate the Society's Jubilee in 1989. Purpose of the award The Award is open to anyone working in New Zealand. It will be granted for: fieldwork; artistic endeavour; publication; research; propagation or cultivation of NZ native plants for educational purposes and/or other studies which promote the better understanding of NZ's indigenous flora and vegetation. The interpretation of these conditions will be flexible, except that the main criterion will be the furtherance of knowledge or promotion of the intrinsic value of NZ's indigenous flora and vegetation. The Award may be used to defray costs such as travel, accommodation, materials or publication. Applications for the Award Applications should be made in typescript to: Secretary, Wellington Botanical Society, PO Box 10 412, Wellington 6143, or by e-mail to bj.clark@xtra.co.nz, by 6 Sep 2018. There is no prescribed application form, but the following must be provided:

- applicant's name,
- postal address, telephone number and e-mail address.
- relevant position held
- summary statement of the applicant's accomplishments in the field of botany—no more than one page
- an outline and timetable for the proposed project for which the Award is sought
- a proposed budget for the project

Tom Moss Student Award in Bryology goes to Otago – again!

John Steel

The annual John Child Bryophyte and Lichen Workshop was held in Hokitika in November 2017 overlapping with the New Zealand Plant Conservation Network biennial conference giving

attendees the options of attending both. The bryophyte presentations were held as part of the conference talks.

Otago University's Departments of Geology and Botany student, Ian Geary, gave an outstanding presentation of his work on the Pliocene moss fossils of Auckland. Among the well-preserved, plant macrofossils, Ian has been working on new discoveries of rarely found mosses and lichens which provide exciting insights into the very different flora of prehistoric New Zealand.

Tom Moss was an enthusiastic amateur bryologist who attended the first John Child Bryophyte Workshop at Pelorus Bridge in 1983, and many thereafter. He made numerous useful collections (now held in Herbarium WELT at Te Papa Tongarewa), including the first modern record of *Fissidens berteroi*, in a stream flowing into Lake Wairarapa. After his death, to commemorate his name, his contribution to New Zealand botany, and his particular interest in bryology, a Trust Fund was established following discussion at the 2006 John Child Bryophyte Workshop. It is administered by the Wellington Botanical Society. The Tom Moss Student Award in Bryology provides an annual prize for the best student contribution to New Zealand bryology and lichenology.

The first award was made to an Australian student in 2007 at a joint workshop held in Tasmania. Since then all the winners have been students from Otago.

Thanks to Jessica Beaver and Rodney Lewington for help with the history of the Tom Moss Award.



*Ian Geary receiving the Tom Moss Award for Bryology.
(Photo: Allison Knight)*

BSO Audrey Eagle Botanical Drawing Competition 2018

Announcing the Botanical Society of Otago's Audrey Eagle Botanical Drawing Competition. Botanical artistry is not a widespread skill, so there's a good chance of winning the first prize of \$100, second prize of \$50 or third prize of \$25! Remember that you must be a current member to enter.

Judging criteria

1. Botanical accuracy
2. Detail, especially of important identification features
3. Clarity of lines
4. Proportional representation and scale
5. Layout
6. Suitability for reproduction in newsletter (grey scale) or website (colour)
7. Accurate caption, eg botanical name of plant, where it came from, date drawn.
8. Botanical notes or comments of interest eg key to botanical details, history, distribution, uses, variations etc. (The NZPCN website could be helpful)
9. Preference will be given to plants that have been rarely illustrated eg a lichen or an uncommon wetland plant would be more valuable scientifically than a kauri.
10. Above all, artistic merit carries the highest rating.

Conditions of entry

1. Unframed entries must be submitted with an entry form, by **Monday October 1, 2018** to the Botanical Society of Otago, PO Box 6214, Dunedin North 9059, or handed in to the Department of Botany Office, 479 Great King Street, between 1-3 pm.
2. The drawing must be your original work. A drawing from life is preferable and a copy of an existing botanical drawing is not acceptable.
3. There is a limit of 3 entries, with a minimum size A4, maximum A3.
4. You should include a title and notes of botanical interest.
5. Judges will be kept unaware of your identity while judging - so don't sign the front!
6. Entries will be displayed and prizes awarded during the talk on Wednesday 10 October 2018, in the Benham Seminar Room on the second floor in the Zoology building, 346 Great King St., beside the Captain Cook Hotel.
7. BSO may use copies, with due acknowledgement, in the Newsletter and website.
8. Entries are open to current BSO members – our subscription is very low! There is a special subscription rate of \$5 for school students. Members who have won first prize in 2 consecutive competitions are not eligible, though they may display their drawings for sale.
9. No prizes will be given if there are no entries of sufficient quality.
10. If there are insufficient entries the competition may be postponed.
11. There is no entry fee, so please include an addressed, pre-paid envelope or tube if you would like your drawings returned.
12. Your entries may be put up for sale at the Members Night if you wish.



ENTRY FORM

Botanical Society of Otago

Audrey Eagle Botanical Drawing Competition, 2018

Name

Address

Email

Phone

Title of entry(s) [limit of 3]

- 1.
- 2.
- 3.

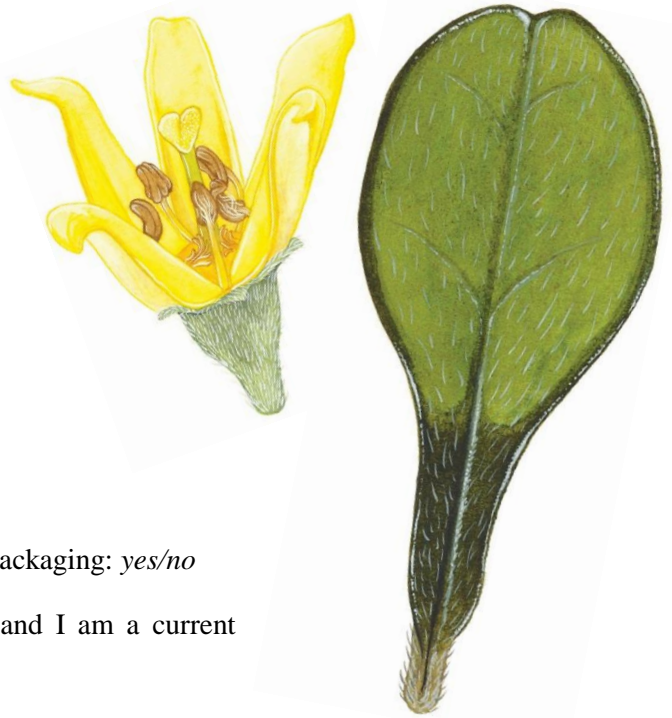
Botanical notes enclosed: *yes/no*

Return: I would like my drawings back: *yes/no*

I have included prepaid and addressed packaging: *yes/no*

Membership/Declaration: This is all my own work and I am a current member of the Botanical Society of Otago.

I am a school student aged:..... years. School:



Signature

Date

Membership forms for the Botanical Society of Otago are available on the back page of the newsletter, the BSO website, <http://www.otago.ac.nz/botany/bs/> and at monthly meetings.

If you are a school student there is a special membership rate of \$5. Please indicate which school you are from on the membership form.



Corokia cotoneaster branch along with details of flower and dorsal and ventral view of a leaf. Artist: Sharon Jones 2014. Medium: watercolour.

Articles

Two new species of *Cardamine* endemic to Otago

John Barkla

Last year a long awaited paper was published by Dr Peter Heenan, formerly of Manaaki Whenua Landcare Research at Lincoln. The paper 'A taxonomic revision of *Cardamine* L.(Brassicaceae) in New Zealand', is the first major monographic revision of the genus in New Zealand. Peter began the revision in 1996 and the product of this major work spans 154 pages.

Forty-one taxa indigenous to New Zealand are recognised, with 31 species newly named and described. Ten previously named taxa are accepted and a new name is provided for one species. An additional four species are accepted as naturalised in New Zealand (Heenan 2017). Members of the Botanical Society of Otago contributed to the revision in various ways including the collection of many representative herbarium specimens.

Many taxa have distributions that include Otago and two newly described and named species, *C. sciaphila* and *C. thalassica*, are thought to be endemic to the region.

Cardamine thalassica occurs in North Otago, on the Kakanui, Hawkdun, and St Bathans Ranges, where it grows on dry, unstable bouldery colluvium and rocky slopes. It's a relatively large bold plant with grey-green thick glabrous leaves. It has been assessed as having a conservation status of Threatened, Nationally Endangered (B1), with the qualifier Data Poor (Townsend et al. 2008).

Cardamine sciaphila is known from the highest parts of the Dunstan Mountains (c.1600 m) and Pisa Range (1620–1850 m) in Central Otago. It grows with low herbs and grasses on shady ledges and crevices of rock tors, outcrops, and bluffs. Its glossy green to bronze-coloured leathery leaves can be difficult to find among other herbaceous vegetation. The species has been assessed as having a

conservation status of Threatened, Nationally Critical (A1), with the qualifier Data Poor (Townsend et al. 2008).

References cited:

Heenan PB 2017. A taxonomic revision of *Cardamine* L. (Brassicaceae) in New Zealand. *Phytotaxa* 330 (1).

Townsend AJ, de Lange PJ, Duffy CAJ, Miskelly CM, Molloy J, Norton DA 2008. *New Zealand Threat Classification System manual*. Science & Technical Publishing, Department of Conservation, Wellington



Cardamine thalassica in Hawkdun Range (Photo: John Barkla)

Keeping up with name changes

John Steel

Sarcocornia to *Salicornia*

A recent treatment¹ in the Amaranthaceae suggests that *Sarcocornia* is better treated under *Salicornia*. This only affects one species in New Zealand: *Sarcocornia quinqueflora* (Bunge ex Ung.-Sternb.) A.J.Scott is now better treated as *Salicornia quinqueflora* Bunge ex Ung.-Sternb. [common names: austral glasswort; beaded glasswort; beaded samphire; bead weed; glasswort; salicornia; samphire; ureure]. This name change has been accepted by Manaaki Whenua - Landcare Research, but not yet by NatureWatch NZ nor New Zealand Plant Conservation Network.

1. Piirainen, M.; Liebisch, O.; Kadereit, G. (2017) Phylogeny, biogeography, systematics and taxonomy of Salicornioideae (Amaranthaceae / Chenopodiaceae) – A cosmopolitan, highly specialized hygrophalophyte lineage dating back to the Oligocene. *Taxon*, 61(1):109-132.

Botrychium to Sceptridium

The Pteridophyte Phylogeny Group¹ has now broken up the Ophioglossaceae into monophyletic groups which they say better reflects its evolutionary history. One of the effects of this is to move some of *Botrychium* (all of ours) into *Sceptridium*. There isn't any intention at this stage of Manaaki Whenua - Landcare Research accepting it here. It is accepted by NatureWatch NZ, but not NZPCN.

1. Pteridophyte Phylogeny Group (2016) A community-derived classification for extant lycophytes and ferns. *Journal of Systematics and Evolution*. 54(6):563-603.

Teucrium to Teucrium

Salmaki et al.¹ in their recent treatment have removed *Teucrium* from Verbenaceae and suggest it is better suited to *Teucrium* in Lamiaceae so our beloved *Teucrium parvifolium* becomes *Teucrium parvifolium*. Manaaki Whenua – Landcare Research sort of accept the change, but won't do so until all the combinations are made and are keeping it in Verbenaceae. NatureWatch NZ and NZPCN are yet to accept it though NZPCN have it the Lamiaceae.

1. Salmaki, Y.; Kattari, S.; Heubl, G.; Brächler, C. (2016) Phylogeny and non-monophyletic *Teucrium* (Lamiaceae: Ajugoideae): implications for character evolution and taxonomy. *Taxon*, 65(4):805-822.

Cardamine now 45 species, 28 of them south of the Waitaki!

We were let off lightly by the treatments of *Kunzea* and *Lepidium*, but Peter Heenan's¹ long-awaited treatment of *Cardamine* will take a bit of getting used to. Good old *C. debilis* completely disappears. I have put together a key to the species found south of the Waitaki so if anyone wants a copy they may email me at john.steel@otago.ac.nz. All are accepted by Manaaki Whenua – Landcare Research, but

NatureWatch NZ and NZPCN are yet to come on board.

1. Heenan, P.B. (2017) A taxonomic revision of *Cardamine* L. (Brassicaceae) in New Zealand. *Phytotaxa*, 330(1):1-154.

Book Review: New Zealand Lichens

Allison Knight

New Zealand Lichens (2018 Revision). Bill and Nancy Malcolm, Micro-Optics Press. 307 pp, A5 (see ad for purchasing details)

This is a brilliant revision, with much more depth and breadth than its title implies. Over 300 pages are packed full of surprises for anyone interested in lichens, from novice, to teacher, to expert. There are more than 700 superb photographs, drawings, microscopic and even SEM images. Use of fresh material, clever stacking techniques and close up photography makes the lichens leap off the page and reveals minute features. Clear line drawings and micrographs throw fresh light on microscopic or internal structures ranging from cross-sections of fertile and non-fertile material, green algae and cyanobacteria, sexual spores and ascus tips, asexual campylidia and conidiophore reproductive structures and much more, such is the wide range and depth of detail. Yet all this complexity of life form is written about in such an entertaining and accessible style that any interested reader could follow it.

A brief forward and introduction give a first taste of the essence of the lichen lifestyle, the richness of New Zealand's over 2000 species of lichens and the value and uses of lichens worldwide. The next 200-odd pages are divided into 22 wide-ranging sections full of fascinating detail. This is relevant to anyone anywhere in the world keen to know more about lichens. That the illustrations are mainly of New Zealand examples is largely irrelevant.

The quirky section headings cry out to be explored further. 'Home is almost anywhere' explores the reasons why lichens can live in a greater variety of places than any plants, and why New Zealand has so many leaf-living lichens, typically found only in the tropics. 'You scratch my back and I'll scratch yours' delves into the complexity of the lichen symbiosis,

including the recent discovery of a basidiomycete yeast that rocked the established view of lichen species each containing one unique fungus, nearly always an ascomycete. The accompanying yeast appears to play an important role in the cortex of Parmeliaceae, one of the largest family of macro-lichens world-wide, yet it remained undetected for over 140 years. *'Origins'* covers 10 pages on the evolution of the lichen lifestyle, while *'Dog-eat-dog competition'* adds another 4 pages on how species evolve. *'Growth forms'* is self-explanatory and the main forms are illustrated over 18 pages, with *'Some exceptions'* devoting another 10 pages to deviations from the three core growth forms.

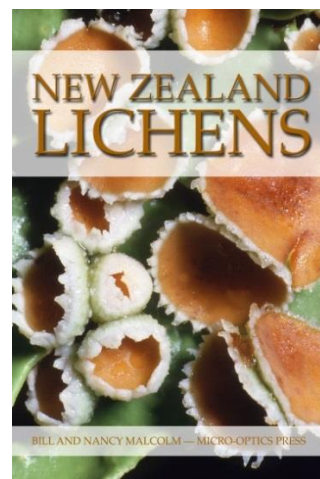
Two sections on *'Light-trappers'* deal with the green algal partners and then the cyanobacteria, while *'Getting the best of both worlds'* devotes 5 pages to the cosy arrangements of tripartite lichens, which contain both green algae and cyanobacteria. *'Gas exchange'* describes and illustrates various adaptations developed to aid the diffusion of gases essential for photosynthesis, and notes their taxonomic importance. *'Drying out'* investigates the miraculous ability of lichens to survive levels of desiccation that would kill other plants, and how this contributes to astonishing longevity and ability to live in extreme conditions. *'Identity crisis'* considers the conundrum that arises when a single species of lichen can associate predominantly with either a green alga or with a cyanobacterium, and sometimes switches between the two forms.

The long-standing mystery of how the various partners in a symbiotic relationship can come together over and over again to form a consistently recognisable 'species' deserves to be thoroughly investigated and the book does this admirably. Fully 30 pages are devoted to sexual reproduction, another 4 pages to unravelling the dispersal and relationships of consistently sterile lichens, followed by sizeable sections on asexual spores and on vegetative reproduction. *'Lichen substances'* turn out to be the myriads of unique chemicals that lichens are capable of manufacturing and this 10 page section discusses the biologic intricacies and taxonomic implications of the major substances. *'Spot tests'* continues the chemical theme for another 10 pages, showing how simple tests can help discriminate between lichen species, and explaining the chemistry behind them.

Have you ever wondered what uses lichens have? The 18 pages on *'Uses worldwide, past and present'* offer plenty of answers. *'Braving the elements'* is not quite the response to a hostile environment that you might first think. Lichens have an astonishing capacity to concentrate and survive levels of radioactivity, copper, iron, zinc, sulphur and the gas form of nitrogen that would be toxic to other organisms. *'Pollution damage'* discusses lichens as sensitive indicators of pollution and elaborates on the remarkable rise and fall of populations of acid-tolerant *Lecanora conizaeoides*. The challenge and history of giving binomial species names to a disparate collection of organisms from different kingdoms that live together in symbiosis is treated superbly in the last of the 22 sections, *'Lichen names'*.

The gallery of images of New Zealand lichens that follows is further testimony to Bill's consummate skill as a photographer and artist. Over 300 species are displayed in colour in the next 79 pages. These are a godsend to New Zealand lichenologists but should also have broader appeal. The New Zealand lichen flora contains a good sprinkling of cosmopolitan lichens as well as many with bipolar, subtropical or temperate distributions. Even the endemic species are mostly in genera that occur overseas. A very thorough index covering 13 pages helpfully gives both old and new names and to round it all off there are two pages of further reading to further whet the appetite.

Thoroughly recommended – a wonderful book with something for every biologist to marvel over. See advertisement for purchasing details.



Lichen Book Cover (Bill Malcolm)



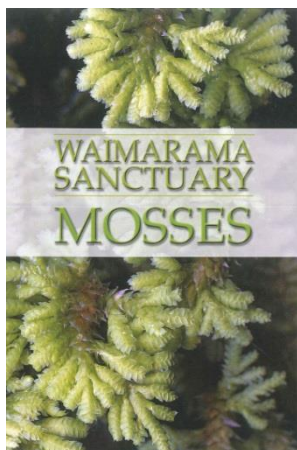
Marvellous mosaic (Photo: Allison Knight)

Book Review: Waimarama Sanctuary mosses

John Steel

Malcolm, W.M.; Malcolm, N.; Shevock, J.R. (2015) *Waimarama Sanctuary mosses*. 102 pp. Micro-Optics Press, Nelson. ISBN 0-9582224- 8-7. \$30.00

At 715 hectares, Waimarama Sanctuary outside Nelson is more than twice the size of Orokonui and comprises native beech and podocarp forest. All up it boasts 250+ species. Sadly, but not uncommonly in such comments, the littlies go unmentioned. However, uniquely I think, this book is the first to rectify such omission by highlighting the bryological flora of this special place, with more than 100 species superbly illustrated and defined. Most of these species can be found locally and may well be worth looking for on your visits to Orokonui. The monies raised from the sale of the book go towards the continuing development of the sanctuary. Like Orokonui, theirs is a continual battle to raise funds to maintain and develop this special place.



Moss Book Cover (Bill Malcolm)

Meeting and Trip Reports

Visit to Southland Covenants, 23rd - 25th February 2018

David Lyttle

The Dunedin contingent assembled at the Mossburn Country Park on Friday evening and settled in to their various tents and cabins. Next morning we met up with Jesse, Brian and the other Southland people in Mossburn and drove out to the covenant site located on Mt Hamilton Road.

The party started from the road at about 400 m elevation and followed an old 4WD track to about 500 m elevation traversing a number of different vegetation types. Both native and exotic species observed were recorded and entered on the existing plant species list.

Most of the area is a large and ancient alluvial fan, although the fan gravels rest on and are mixed up with glacial outwash which came from the Te Anau glaciers through the gap where Chewings Road goes (between Centre Hill and Mt Hamilton). The younger creeks emerging from higher up on Mt Hamilton have cut down through it leaving the landscape we see today. However, the slightly higher or rounded topography is mainly Cenozoic sediments: sandstone, mudstone and so forth. Knobs of these rocks stick up through the fans and outwash, and the rocks are exposed in the incised creek beds. The knobs and rounded hills are distinct from the Mt Hamilton massif which is all Triassic sandstone and much older than the sediments out on the hill foot slopes.

There are some active faults running from Mossburn south toward Beaumont Station (one crosses the main road in Mossburn itself) and the activity on these may have back-tilted some terraces, creating local ponds or areas of very low stream gradient. This has created the extensive wetlands and bogs that are dominated by red tussock. On the higher, more elevated areas red tussock is less important and shrub land dominated by manuka becomes the predominant vegetation type. In the deeper gullies on the toe slope

of Mt Hamilton there are scattered of pockets of beech, surviving relicts of past fires.

Red tussock (*Chionochloa rubra* subsp. *cuprea*) grassland is the predominant plant cover in the lower parts of the covenant. On the drier sites, shrubs become an important part of the vegetation. Species include the ubiquitous manuka (*Leptospermum scoparium*), various *Coprosma* species including *C. dumosa*, *C. propinqua*, *C. rugosa* and *C. cheesemani*, *Corokia cotoneaster*, *Ozothamnus vauvilliersii* and *Discaria toumatou*. Spaces between the tussocks are colonised by a suite of smaller shrubs including *Androstoma empetrifolium*, *Coriaria sarmentosa*, *Gaultheria antipoda* and *Pentachondra pumila*. *Coprosma dumosa* was fruiting heavily at the time of our visit with different plants bearing berries of various shades of white, pink, yellow and orange. An unexpected find was a single plant *Coprosma petriei* which was a new record for the covenant. This is a mat-forming species that has spectacular sky-blue berries and generally grows on dry well-drained sites. The *Coprosma* species *C. elatirioides* was observed growing on the damper sites which it favours. Two *Pimelea* species were recorded; *P. prostrata* distinguished by its white fruit, glaucous foliage and glabrous leaves and *P. oreophila* which has a characteristic tuft of hairs at the leaf tips. The distinction between the two species was not always clear cut as it appears likely that the two populations have become mixed through hybridisation and genetic introgression. Herbaceous plants were well represented; *Gentianella grisebachii* was noticeable as it was in flower and very abundant. A patch of dark-leaved *Gunnera prorepens* growing on a streamside bank was recorded and photographed. *Gunnera dentata* with orange berries and *Gunnera monoica* were also present.



Fruit of *Coprosma dumosa* (Photo: John Barkla)



Streamside *Gunnera prorepens* (Photo: John Barkla)

Many other common tussock grassland herbaceous species including *Acaena anserinifolia*, *Anaphalioides bellidioides*, *Celmisia gracilentia*, *Gonocarpus micranthus*, *Helichrysum filicaule*, *Lobelia angulata*, *Raoulia glabra*, *Raoulia subsericea*, and *Viola cunninghamii* were found and recorded. Bogs and boggy turfs produced another set of species including *Azorella nitens*, *Ranunculus glabrifolius* and *Potentilla anserinoides*. Another new record for the covenant was *Ranunculus ternatifolius*, a nationally threatened species of buttercup. This buttercup is usually found growing close to running water under overhanging vegetation such as red tussock. *Deschampsia cespitosa* a cosmopolitan grass species but with “at risk – declining” classification in New Zealand was recorded as locally common. As would be expected in a wetland area, rushes and sedges were abundant. Species recorded included *Carex coriacea*, *Carex secta*, *Carex tenuiculmis* (at risk – declining) *Carpha alpina*, *Eleocharis acuta*, *Eleocharis gracilis*, *Oreobolus pectinatus*, *Oreobolus strictus*, *Schoenus pauciflorus*, *Empodisma minus*, and *Juncus edgariae*.

Further up the slope at 500 metres elevation red tussock gave way to manuka shrubland. Many of the shrub species occurring 100 m lower were still present but additional species entered the mix. Forest was present in sheltered gullies and remnant silver beech (*Lophozonia menziesii*) stands harboured ferns and lianes; *Chionochloa rigida* subsp. *C. rigida* was present in the open sites and two *Dracophyllum* species *D. longifolium* and *D. rosmarinifolium* became common. A single bog pine (*Halocarpus bidwillii*) was found growing in manuka shrubland. A *Kelleria* species identified as *Kelleria laxa* was recorded here as well.

A comprehensive plant species list has been compiled for the covenant (Mt Hamilton flats wetland); Brian Rance February 2009, Brian Rance November 5th 2015, Kelvin Lloyd November 18-20th 2015 and Brian Rance with the Otago Botanical Society (this field trip) 24th February 2018. Table 1 was produced by aggregating all records.

Table 1: Vascular plant species recorded for Mt Hamilton Flats Covenant

Plant category	Native	Exotic
Ferns	21	
Conifers	3	3
Trees and shrubs	45	3
Lianes	5	
Herbs	77	34
Grasses	11	9
Rushes and sedges	22	8
Orchids	8	
Other monocots	8	
Total	200	55

A total of 255 vascular plant species have been recorded, of which 200 are native and the remaining 55 exotic. The varied topography of the site provides a diversity of habitats within the covenant and explains the rich biodiversity present in the native flora growing there. Although the area has been grazed in the past the impact has not significantly modified the vegetation. Woody weeds such as gorse (*Ulex europaeus*) and broom (*Cytisus scoparius*) have the potential to become problems if not controlled and wild pigs are having an impact in places where there is cover and shelter. Introduced pasture grasses and clovers and their associated suite of exotic weeds are present throughout the covenant but hopefully they will remain only a minor element of the vegetation. It is gratifying to see the preservation of this representative example of a Western Southland red tussock/shrubland/wetland biome. Landcorp is to be commended for recognising

the importance of retaining native biodiversity alongside commercial farming activities through the creation and protection of the area as a QEII covenant.

The following day we visited a second covenant situated on the White Hill Wind Farm operated by Meridian Energy. It was a slightly surreal experience driving to the crest of the Barnhill Range past the massive towers supporting the rotor blades and turbines in deteriorating weather. The turbines are stopped when the wind speed reaches 90km/h. They were stopped during our visit but despite the windy conditions we enjoyed magnificent views from the top (650 m) to the west to Mt Hamilton where we had been the previous day and to the north towards West Dome. The vegetation here was mixed tussock shrubland with numerous rock outcrops along the ridge crest. Shrubs included *Discaria toumatou*, *Corokia cotoneaster*, *Coprosma dumosa*, *Coprosma rugosa* and a small-leaved *Melicytus*. My notes record this as “*Melicytus* aff *alpinus*, small, open branched shrub, branches lenticellate, fruiting heavily”. Two species of speargrass were recorded; *Aciphylla glaucescens* and the finer-leaved *Aciphylla subflabellata*. A new record for the site was *Epilobium microphyllum*, a species usually found growing on stony river beds but here it was growing on gravel pads around the building housing the wind farm equipment. As we left a rainbow appeared framing the eastern edge of the Takitimu Mountains which were rapidly becoming obscured by advancing rain.

The final site we visited that day was a limestone crag on private farm land at Castle Downs. Rather than trees, the vegetation on this outcrop is mainly shrubby with some very large specimens of *Myrsine divaricate*, all fruiting heavily, being present. Other species recorded were *Pseudopanax ferox*, *Sophora microphylla*, *Raukaua anomalus*, and *Teucrium parvifolium*. There were two species of small-leaved *Melicytus* present. The first was similar to the one that had been observed earlier in the day on Barnhill. My notes record it as “*Melicytus* aff *alpinus* agg, Branches spreading, open, twigs lenticellate. All plants observed were fruiting heavily ie hermaphrodite”. The second was quite different: “*Melicytus* sp. shrub compact, tightly branched, fruit hidden under branches. Twigs not lenticellate but

covered with a delicate pellicule. Non-fruiting plants observed ie dioecious". Three mistletoe species were found; *Korthalsella clavata* on *Raukaua anomalus* and *Coprosma propinqua*, *Korthalsella lindsayi* on *Myrsine divaricata* and *Ileostylus micranthus* on *Corokia cotoneaster*. The final species of note was the herbaceous *Anisotome brevistylis* growing in crevices in the limestone.

The day ended with a trek to a viewpoint at the top of the crag as the rain was coming in. Southland rain is wet and we all got very wet so we retreated to a coffee shop in Mossburn before dispersing back to our respective homes.

Despite the rain and the wind, we all very much enjoyed the weekend as there was a lot to see and do. I would like to thank Jesse Bythell, the local QEII representative, for arranging these visits to places where we would not otherwise have had access, John Barkla for organising the weekend and DOC botanist Brian Rance for sharing his local botanical knowledge with us.

Field trip participants: Jesse Bythell, Brian Rance, Chris Rance, BT, Dave Toole, Marilyn & John Barkla, Kath Graham, Janet Ledingham, Moira Parker, Helen Jones-Rippey, Allison Knight, John Knight, David Lyttle.



David and Brian debating an ID (Photo: John Barkla)



Lichen report, McKenzie's Covenant, Mt Hamilton Station, 24th February 2018

Allison Knight

My heart sank when I saw that Landcorp's new QEII McKenzie's Covenant on Mt Hamilton Station at the foot of the Takitimu Range consisted mainly of wetland, subalpine scrub and tussock - not very promising habitats for the lichens I was seeking. But lichens live practically everywhere and I was pleasantly surprised. Growing on twigs beside and below the track were several *Usnea* species useful for Jennifer Bannister's revision of this genus. On the slope below the track I found *Hypogymnia lugubris* on low branches and Jessie kindly took me to a patch of *Cladonia confusa* growing on the ground lower down the slope. Another terricolous (ground living) lichen, a species of *Placopsis*, was growing in a ditch beside the track and back on the road John kindly stopped the car so I could collect *Stereocaulon ramulosum* on a roadside bank. The last four species will go to a Metagenomics study of the lichen microbiome, with comparisons with samples from the Subantarctic Islands. John took me on a side trip to Princhester Hut, where the beech forest at the base of the Takitimu Mountains is dripping with lichens, and on the way home we stopped off at Dolamore Park, near Gore. This sits on the edge of the Croyden Bush Scenic Reserve, on the lower slopes of the Hokonui Hills and contains one of the last remnants of east coast lowland podocarp/broadleaf forest. The ancient trees (and the lichens on them) are stunning and the area is well worth a dedicated weekend field trip.

Thanks to John Barkla for organising everything, and to Jesse Bythell, Southland QEII rep., for leading such a worthwhile trip.

Left: *U. cornuta* from Mt Hamilton (Photo: Jennifer Bannister)

Spring Flowers of El Camino, a talk by Kath Graham, 28th February 2018

Mary Anne Miller

Kath Graham on the El Camino did walk so came to a BSO meeting to give us a talk. Her route went from the French border to Santiago de Compostela in Spain.

And those who attempt this "way" know all about pain.

But she was there for more than a pilgrimage, it was the botany that enhanced her magnificent images.

The spring palette a delight to see and the viewers helped with some id.

Many thanks Kath for opening this treasure for our botanical pleasure.

Visit to the Botanic Garden Propagation Centre and their NZ Collection, 3rd March 2018

Lala Frazer

Now when we pass that attractive timber wall in the Upper Gardens, Robyn Bridges, Rose Clucas, Ivan Lin, Toni Wilson, Rosemary Leader and Lala Frazer (recorder), who visited as part of a Botanical Society Field Trip on March 3rd 2018, will know exactly what lies behind the outer walls of the Gardens Propagation Centre.

Alice Lloyd-Fitts, who is in charge, told us of how much they appreciated the new facility. She explained that it was designed locally around flow charts of their activities – work patterns and tasks, and apart from not yet having a shade house (dropped off to save money!), and wishing they had asked for a larger alpine house, they were very satisfied with the building.

The previous four hours hand watering and misting a day in the hothouses by the apprentices now takes only half an hour. No longer do they have to cart materials and plants along paths too narrow even for wheelbarrows, and the potting mixes can be unloaded directly into loading bays which are under cover within the building. The large areas and concrete floors make for easy cleaning and more

temporary storage. The very large potting up area, separate from the staff areas and glass houses means that they can easily accommodate large visiting groups who come to assist.

The unit serves only as a propagating and holding area for the Botanic Gardens and the Chinese Gardens. Essentially the facility is mainly a storage area to hold plants not currently on display. There are about 11,000 species and many of them require specialist conditions. There are several different glasshouses, each of which simulates temperature and rainfall conditions eg: desert, temperate, tropical environments.

No commercial propagation is undertaken, although there is some work done with DOC, growing some endangered plants. There are also some plants grown from seed and cuttings collected from the subantarctic islands.



Stilbocarpa polaris growing well in the alpine house in the propagation complex. The seed was collected from Enderby Island by Kate Caldwell a few years ago (Photo: Kate Caldwell)

Some propagation of bedding plants is done by outside contractors and they also buy in species such as roses and rhododendrons from specialist breeders.

Before leaving the Propagation Centre we saw the remains of the corpse flower (*Amorphophallus titanum*) which created such interest recently when the flower was on display in the Lower Gardens. We saw where staff from the Botany Department had cut a window in it to extract the pollen so that it can be used to fertilise the plants held in other areas when they flower.

We then went outside across the road with the NZ Collection Curator, Kate Caldwell, and were able to admire some of the stunning specimen trees planted under the guidance of one of the original Gardens' Directors, David Tannock. Seeing a group of mature trees together – for instance, podocarps or beeches - made it easy to identify the defining features. This is a real treasure to be valued.

While we wandered around identifying different groups of plants, Kate explained that time and resources are the main limiting factors to expanding the collection. For instance, collection from the wild is not always easy, or cheap.

Other problems she encounters are hybridisation when similar species are grouped, and shading of sun lovers as surrounding trees grow taller. They are now concentrating on grouping plants in the correct habitat, rather than by species.

There were lots of questions and it was great to have these two specialists able to answer them. A very stimulating field trip, with lots of practical tips and insights.

A 70 million year record of Araucarian forests in Zealandia: new discoveries of wood, leaves and biotic inclusions in amber, a talk by Daphne Lee, 14th March 2018

Ian Geary

Daphne's talk was an excellent introduction to the Araucariaceae fossils of NZ and the previous 5 to 7 years of collective research by the amber team. New Zealand was shown to have an exceptional amber (fossil tree resin) record in time and space, with amber found throughout the country without notable

absence over the last 70 million years. This makes NZ amber special because nowhere else in the world can amber be traced through time in this way. Other ambers, such as Baltic and Dominican represent relatively restricted time periods. NZ amber is also unique for retaining an extant modern analogue, the kauri (*Agathis australis*).

Daphne discussed the evidence for each of the three possible sources of NZ amber: *Agathis*, *Araucaria* and *Wollemia* (all Araucariaceae). Notable fossil localities include Shag Point, Wangaloa (teredo-bored wood), Kaitangata, Nightcaps and Pomahaka. The oldest undoubted *Agathis* fossils are from Newvale mine in Southland where leaves, wood and resin are found. This is interesting because leaves are usually not well-preserved in coal, yet Newvale even preserves diagnostic cuticle. Luckily a range of fossils are preserved in NZ, e.g. wood, leaves and pollen, because pollen alone cannot distinguish between *Agathis* and *Araucaria*.

Most NZ amber is opaque because of microscopic bubbles, making it difficult to find fossil inclusions. NZ amber was considered devoid of fossils and a special clearing treatment that introduces epoxy under vacuum (developed by colleagues at the University of Göttingen) was required before the first fossils could be revealed. Fossils are found by grinding 1 mm increments off the amber surface and polishing it when fossils are discovered.

Abundant biotic inclusions are only known from around 15 amber localities around the world. NZ fossils are very rare at around 1 per 500 amber pieces. Fossils include uncommon plant material such as wood and hairs; Ascomycota fungi (a Southern Hemisphere first); and a diversity of invertebrates. The fossil invertebrates of NZ amber are especially informative, examples include: tiny soft-bodied nematodes, one is even ensnared in the



A selection of biotic inclusions discovered within NZ amber: (A) a pseudoscorpion; (B) a springtail; (C) a wasp; (D) hyphae of an Ascomycota fungus (Image: Daphne Lee and colleagues)

hyphae of a predatory fungus!; two pseudoscorpions, representing two thirds of the Southern Hemisphere fossils; diverse mites, some with preserved spores in their gut; springtails; one book louse (Psocoptera), representing one third of the known fossils (globally); true bugs (Hemiptera); beetles; fly larvae and fungus gnats; butterfly/moth scales; and Hymenoptera, one ant representing a locally extinct subfamily. Fossil invertebrates from NZ amber are quite different yet complement those of the maars Hindon and Foulden, and Daphne emphasized that understanding our entomological history requires study of fossils from amber and maar sediments.

Daphne discussed sub-fossil swamp kauri resin and why biotic inclusions from these were not investigated by the team. Firstly, these deposits are geologically young (<50 thousand years). Secondly, although specimens with “fossil inclusions” are well known, most are suspected to be fakes made by gum diggers.

Summing up, Daphne reiterated the long history of araucarians in NZ, that these are the first major fossil-bearing amber deposits in the Southern Hemisphere and that NZ amber is the first confirmed to belong to Araucariaceae.

Daphne’s talk was based on her and her colleagues’ recent publication on NZ amber in the journal *Gondwana Research*. Please feel free to email her if you would like to read a copy (daphne.lee@otago.ac.nz).

Lichen report, Trip to McPhees Rock, 7th April 2018

Allison Knight

The higher up the mountain the greater the dominance of lichens, until eventually their amazingly successful symbiotic forms extend well beyond the reach of flowering plants. The trip to McPhees rock provided rich lichen pickings. John’s eye was first taken by a photogenic clump of the white ‘wormy’ *Thamnolia vermicularis*, and mine by an undescribed *Lichenomphalia* species (see photo 1). Interestingly, Penelope photographed another, more well known species. Jerry Cooper is working on the taxonomy of this genus and is keen to get fresh, uncontaminated and carefully dried specimens.

Lichenomphalia is one of the very few lichen genera where the fungal partner is a mushroom-fruiting basidiomycete, rather than an ascomycete with more or less cupped fruiting bodies. Once I bent down to take a photograph I realised that there were several other terricolous (ground-living) lichens living in the cushionfield. These included the spiny *Cetraria islandica* ssp. *antarctica* and *Cetraria aculeata*, ubiquitous *Cladia aggregata* and various species of *Cladonia* sheltering in the hollows; *Lecanora broccha* grew on dead tussock bases and the fine strands of mist-net *Gowardia* (was *Alectoria*) *nigricans* straggled over cushion plants.

The towering schist tors were covered by multitudes of lichens and we only had time to scratch the surface. Between us, John Steel and I collected what turned out to be 5 different species of alpine and subalpine *Usnea* to help with Jennifer Bannister’s revision of this genus. They included the richly fertile *U. ciliata*, sparingly fertile *U. subcapillaris*, sorediate *U. acromelana* and *U. torulosa* and pseudo-isidiate *U. inermis* on exposed rock faces. Often there were several different species growing together (see Photo 2). Intertwined at the base of many *Usnea* were other lichen species seeking shelter from the bitter wind. The most exciting of these was the tiny and seldom seen *Bartlettia fragilis*. We also teased out *Menegazzia inflata* and another species of *Menegazzia*, *Hypogymnia lugubris*, and an alpine *Parmelia*. Also braving the cold wind on the exposed rock were several species of blackened *Umbilicaria*, clinging to the rock with a single ‘umbilical’ stalk.



Photo 1: An unrecorded *Lichenomphalia* with an areolate thallus made of green algae inside island-like lumps, McPhees Rock. (Photo: Allison Knight)



Photo 2: A community of alpine *Usnea* on a rock tor at McPhees Rock. Clockwise from top left: *Usnea subcapillaris*, fertile *U. ciliata* and sorediate *U. acromelana*. (Photo: Allison Knight)

Rock crevices sheltered all manner of interesting and colourful alpine lichens. Near the openings, clumps of bright orange fruticose *Teloschistes fasciculatus* competed for vibrancy with orange-red foliose *Rusavskia* (was *Xanthoria*) *elegans*. Sheltered overhangs harboured white crusts of warty *Pertusaria platystoma* (was *otagoana*), and *Lepra* (was *Pertusaria*) *dactylina*. Wide-eyed brown fruiting discs of *Psoroma buchananii* stared out amongst clumps of pixie cup *Cladonia* creating a fairy-tale grotto in a damp, mossy crack. (Photo 3)

Many thanks to David Lyttle for organising such a splendid trip, to John Steel for transport to the bottom of the mountain and back and to John Knight for heroically driving me right to the top.



Hardy photographers at McPhees Rock. Left to right: Penelope Gillette, David Lyttle, Alyth Grant and John Steel (Photo: Allison Knight)

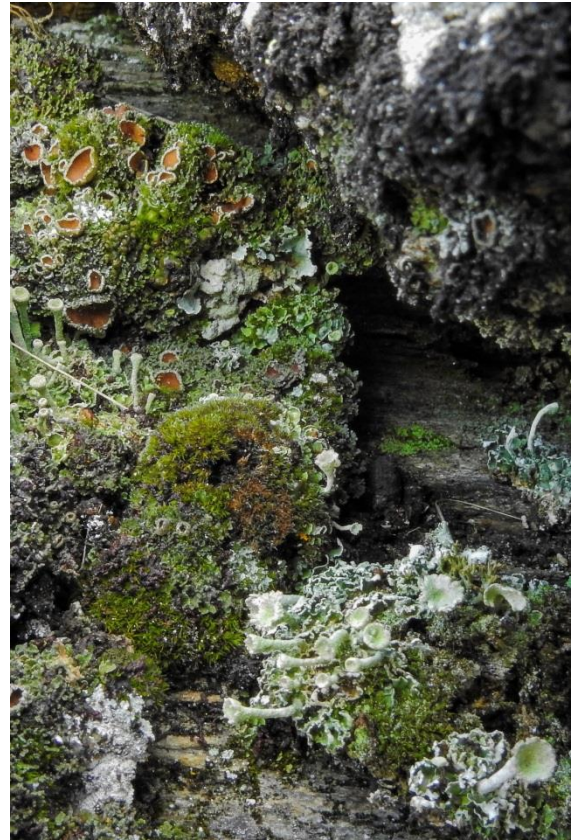


Photo 3: *Psoroma buchananii* amongst cupped *Cladonia* in a crevice at McPhees Rock. (Photo: Penelope Gillette)

Identifying plants in Māori textiles: the why and hows, a talk by Dr Bronwyn Lowe, University of Otago, 11th April 2018.

Gretchen Brownstein

Understanding what Māori textile taonga are made of not only helps us better understand past cultural practices but also how these taonga can be conserved for future generations. Dr. Bronwyn Lowe (from the University of Otago) talked about her work over the last 10 years with Te Papa and The Auckland Museum, along with other collaborators, to find methods for identifying the plant species used in creating these beautiful and functional textiles so that they can be protected for future generations to see.

Prior to arriving in New Zealand, Polynesians used Taupa (paper mulberry) for making the cloth used in sails and clothing. But when they arrived in New Zealand, they had to adapt as Taupa (a tropical species) didn't grow this far south. The New Zealand natives Ti (*Cordyline australis*), harakeke (*Phormium tenax*) and kiekie (*Freycinetia banksii*)

became the go to plant species used in weaving, although other native species were also used, e.g., clubmoss, *Celmisia*, spaniard, and lacebark.

The plants are processed in a variety of ways before being used in weaving. Sometimes the leaf is left nearly entire, making the identification of the species used relatively easy. In other cases, the leaf is processed to extract the fibres and then dyed, changing the leaf structures such that a traditional botanist might not be able to identify it. Bron beautifully illustrated this with some examples of kēte made using different materials and processing techniques.

Bron and her team firstly put together a reference collection of plant samples that had been processed in the traditional manner. Using these reference collections, they are able to help museums identify plant species in their artefacts; often correcting mis-identifications. Bron then talked about the different microscope techniques used to identify the fibres. Polarised Light Microscopy (PLM), which has been used for fibre identification overseas, has produced some great results. They are able to differentiate between the harakeke and kiekie fibres and even between different species of *Cordyline*. This technique requires only a very small sample, about 5mm, so the artefacts are not damaged. You really don't want to destroy something in the process of finding out what it is!

Bron then went on to talk about their work using light aging to check fading of the different traditional dyes used. They found that the red dyes are more resistant to fading, while the black dyes, due to the acidic dye reactions, fade more rapidly and break down the fibres of the artefact. This has implications for how long artefacts can be on display. The talk concluded with a brief discussion of the consolidants (materials that are applied to an artefact to protect it) that are currently being tested on fibres from different plant species.

This wonderful and interesting talk illustrated how difficult and important it is to identify species used in Māori textiles. Difficult as the normal features a botanist might use are no longer present. Important as it helps in understanding cultural practices and allows these taonga to be cared for properly.

Photographic competition, 9th May 2018

John Barkla

This year we had 47 photos taken by 11 members. With two of our regular judges unavailable we were pleased to have Laurie White and Mike Thorsen stepping in to join regular judge Kelvin Lloyd. Laurie and Mike kindly talked us through the judging process. Each photograph was carefully critiqued, and the judges had plenty of useful tips and advice for improvement. They didn't always agree with each other which gave credence to the notion that what makes a good photo depends a lot on personal preference. There was plenty of discussion around the merits of portrait vs landscape, more sky vs less sky, and sharp background vs blurred background.

Prizes were awarded to the winner of each of the three categories, as well as the Members Choice. The judges also chose to acknowledge 'Honourable Mentions', 'Highly Commended', and, in a further departure from past competitions, an 'Overall Winner'.

Results were:

Plants and People

Highly commended	Allison Knight (Plants, People, Photography)
	John Knight (Lik 'n lichens)
Winner	Allison Knight (Unnatural selection?)

Plants in the landscape

Honourable mention	Esther Dale (Crossing Paths)
	Gretchen Brownstein (Breakfast viewing)
	John Barkla (<i>Gentianella bellidifolia</i> , St Marys Range)
Winner	Catriona Gower (Papatowai foreshore)

Plant Portrait

Honourable mention	David Lyttle (Symmetry)
Highly commended	Esther Dale (A long way from home)
	Moira Parker (<i>Myosotis uniflora</i>)
Winner	Penelope Gillette (Flowering Fiordland sun – <i>Dracophyllum menziesii</i>)

Overall Winner

Penelope Gillette (Flowering Fiordland sun – *Dracophyllum menziesii*)

People’s Choice

John Knight (*Pleurophyllum profusion*)

See more winning photos on the inside back cover.



Unnatural selection? (Photo: Allison Knight)



Pleurophyllum profusion (Photo: John Knight)

Minutes of Botanical Society of Otago AGM, 9th May 2018

Allison Knight

Chair: Gretchen Brownstein

Apologies: Mary Anne Miller, Robyn Bridges, Ian Geary, Geoff Cutfield, David Lyttle, Jean Bretherton

Minutes of 2017 AGM, Chairman's and Treasurer's reports: Posted on the BSO website, distributed at meeting and accepted as read.

Election of Officers: The following were elected unopposed.

Chair *Gretchen Brownstein*

Vice Chair *John Barkla*

Secretary *Allison Knight*

Treasurer *Mary Anne Miller*

Committee:

David Lyttle (Publications)

Robyn Bridges (Communications officer),

David Orlovich (Web manager)

Tina Summerfield (University liason)

Esther Dale (Badges, online marketing)

Lydia Turley (FaceBook, Newsletter Editor)

Ian Geary (Student liason)

Sharon Jones (Botanical Art)

Sarah Kilduff

The new chair welcomed the two new committee members, Sharon Jones and Sarah Kilduff. She proposed a vote of thanks to David Lyttle for all the hard work he has put in as chairman over the last 9 years, and to the rest of the elected committee for all the work they have done over the last year to keep the Society flourishing (as long as everyone remembers to pay their membership subscriptions at the beginning of each year!). Gretchen also thanked retiring members Bridget Thomas for her work on the committee, Kate Caldwell for the fantastic job she has done on the newsletter and Facebook, and John Steel who has been a staunch supporter of the Botanical Society since its inception 43 years ago and has indicated that he will continue to be supportive.

Meeting closed in a record is 5 minutes! - *can we ever beat that??*

Botanical Society of Otago

Patron: Audrey Eagle

Website: <http://www.otago.ac.nz/botany/bs/>Email: bs@otago.ac.nz**Committee 2018**Chair: **Gretchen Brownstein**Vice Chair: **John Barkla**Secretary: **Allison Knight**Treasurer: **Mary Anne Miller**Communications and Programme: **Robyn Bridges**Web Editor: **David Orlovich**University Liaison: **Tina Summerfield**Publications: **David Lyttle**Newsletter Co-Editor: **Lydia Turley**Newsletter Co-Editor and Botanical art: **Sharon Jones**Student Liaison: **Ian Geary**Online marketing and badges: **Esther Dale**Committee: **Sarah Kilduff**BrownsteinG@landcareresearch.co.nzjbarkla@doc.govt.nzallison.knight.nz@gmail.commaryanne.miller53@gmail.comrobyn.j.bridges@gmail.comdavid.orlovich@otago.ac.nztina.summerfield@otago.ac.nzdjlyttle@ihug.co.nzlydiamturley@gmail.comsharon.jones388@gmail.comian.j.geary@gmail.comdales214@student.otago.ac.nzsarah.kilduff@dcc.govt.nzPlease submit copy for next newsletter to Lydia Turley by 10th September 2018**This Newsletter was published on 29 May 2018.****ISSN 0113-0854 (Print) ISSN 1179-9250 (Online)**Buttons for botanical pundits – still available at BSO meetings or at <https://ahi-pepe-mothnet.myshopify.com/>



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Flowering Fiordland sun –*Dracophyllum menziesii* (Photo: Penelope Gillette)



Papatowai foreshore (Photo: Catriona Gower)

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Right: Corokia cotoneaster branch (Artist: Sharon Jones)



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