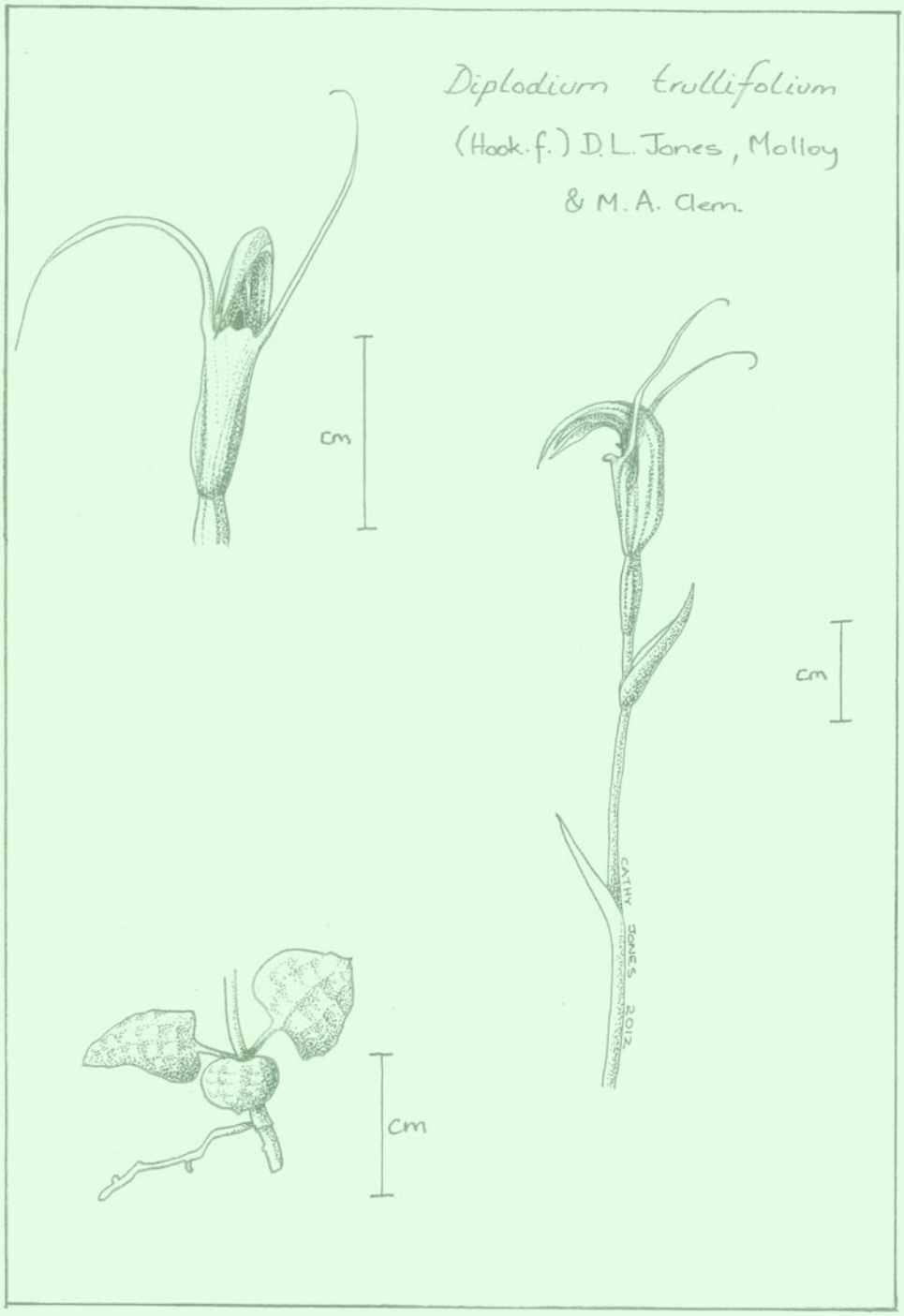
NEW ZEALAND BOTANICAL SOCIETY

NEWSLETTER

NUMBER 109 September 2012



New Zealand Botanical Society

Subscriptions

The 2012 ordinary and institutional subscriptions are $25 (reduced to $18 if paid by the due date on the subscription invoice). The 2012 student subscription, available to full-time students, is $12 (reduced to $9 if paid by the due date on the subscription invoice).

Back issues of the *Newsletter* are available at $7.00 each. Since 1986 the Newsletter has appeared quarterly in March, June, September and December.

New subscriptions are always welcome and these, together with back issue orders, should be sent to the Secretary/Treasurer (address above).

Subscriptions are due by 28 February each year for that calendar year. Existing subscribers are sent an invoice with the December *Newsletter* for the next years subscription which offers a reduction if this is paid by the due date. If you are in arrears with your subscription a reminder notice comes attached to each issue of the *Newsletter*.

Deadline for next issue

The deadline for the December 2012 issue is 25 November 2012.

Please post contributions to:
Lara Shepherd
Museum of New Zealand Te Papa Tongarewa
169 Tory St
Wellington 6021

Send email contributions to editor@nzbotanicalsociety.org.nz. Files are preferably in MS Word, as an open text document (Open Office document with suffix ".odt") or saved as RTF or ASCII. Macintosh files can also be accepted. Graphics can be sent as TIF JPG, or BMP files; please do not embed images into documents. Alternatively photos or line drawings can be posted and will be returned if required. Drawings and photos make an article more readable so please include them if possible.

Cover Illustration

Diplodium trullifolium (Hook.f.) D.L.Jones, Molloy & M.A.Clem. drawn by Cathy Jones from a specimen collected at Mistletoe Bay, Marlborough Sounds on 5 August, 2012.

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N E W S L E T T E R

NUMBER 109 September 2012

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NEWS

New Zealand Botanical Society News

- **Call for Nominations**

Nominations are called for the following positions of Officers and Committee of the New Zealand Botanical Society for 2013:

- President
- Secretary/Treasurer
- 3 Committee Members

Nominations for all positions opened 1 September 2012 and close on 19 November 2012. Nominations shall be made in writing to the Secretary, c/o Canterbury Museum, Rolleston Avenue, Christchurch 8013, and shall be signed by the Proposer, the Seconder, and by the Nominee to indicate their acceptance of nomination. If necessary, ballot papers for a postal election will be circulated with your December *Newsletter*.

- **Allan Mere Award 2012**

The NZBS Committee is pleased to announce that Cathy Jones, formerly from DOC, Nelson, has been awarded the Allan Mere for 2012. Cathy receives the award for her all-round contribution to botany in New Zealand as an artist, teacher, conservationist and leader of regional botanical societies.

The Wellington Botanical Society nominated Cathy and the proposal was seconded by Nelson Botanical Society. In adddition Auckland, Wellington and Rotorua Botanical Societies supported the nomination as did former DOC colleagues Martin Heine, Simon Moore, Shannel Courtney, Jan Clayton-Greene and Peter de Lange.

Cathy's excellent plant illustrations have featured on the cover of almost a quarter of the New Zealand Botanical Society Newsletters. Her striking paintings frequently feature endemic plants. She has been the President of Nelson Botanical Society for twelve years and on the committee of that Society as well as Waikato Botanical Society in the past. Since 1996, Cathy has led the Auckland Botanical Society summer camps in the South Island.

In addition, Cathy has contributed very broadly to teaching and mentoring botanical society members and DOC staff in plant identification and conservation. She has also led several threatened plant recovery groups. A selection of comments below from all who contributed to the nomination indicates the breadth of Cathy's contribution to botany.

Cathy's enthusiasm and obvious passion for plants made botany come to life for the "beginner botanists" while on field trips with the Society.

All botanists in New Zealand will be grateful to Cathy for the delightful and highly skilled drawings she has done on the covers of numerous issues of the New Zealand Botanical Society Newsletter. These beautifully illustrate many lesser-known species of native plant – many of them alpines and otherwise not illustrated in the literature – with accurate details of vegetative and reproductive parts.

Cathy's work as a threatened plant ecologist with the department of Conservation has benefitted members of the Society immensely by imparting plant iodentification skills, nurturing an appreciation of the less spectacular elements of our natural heritage, highlighting the importance of habitat and habitat protection, threat mitigation and management.

Cathy also loves plants, she grows them, she paints them, and she draws them. Her art has graced many a cover of the New Zealand Botanical Society Newsletter – probably now more consistently so than any other contributing artist. Cathy is not paid to do this either, she does it because she wants to.

Administratively and in an advocacy sense, Cathy has contributed hugely to botany in New Zealand through her contribution to many botanical societies as President, committee member, field trip leader, summer camp organiser, guest speaker and teacher.

Cathy's paintings are recognised not only by professional peers and native plant enthusiasts but as outstanding works within the art world.

Cathy may not have discovered new species, or named one, she may not have fought major environmental issues or published prestigious papers in internationally recognised journals, no, rather her contribution has been passive education, and so probably in the long run way more important in bringing in new people to the world of plants.

The breadth and depth of her expertise means that she consistently provides accurate advice and increases the skill level and knowledge of people that she works with, as well as providing and generating enthusiasm for flora amongst those she works with.

Cathy's competent leadership and in-depth knowledge of the regional floras has inspired the members of the society and has been a significant contributor to increasing our membership to around 100 – no small feat for any provincial society these days.

Professionally, Cathy has contributed much to the knowledge and management of plant communities and threatened flora in New Zealand. In a private capacity, through Botanical Societies and other groups, she continues to work tirelessly to nurture an enthusiasm and knowledge of the New Zealand flora in others.

Cathy will receive the Allan Mere at the last monthly meeting of the year for Nelson Botanical Society on 17 September with Anthony Wright making the presentation.

Regional Botanical Society News

- **Auckland Botanical Society**

June Meeting

Anne Gaskett's Plant of the Month talk highlighted her interest in plant/animal interactions, with a description of the trigger mechanism that gives some plants in the family Stylidiaceae the common name of "trigger plants".

Janeen Collings, Senior Regional Advisor, Flora, for Auckland Council, was involved with the conservation of the Three Kings Island endemics, *Tecomanthe speciosa* and *Pennantia baylisiana,* in her previous role with the Department of Conservation in the Far North. Both plants, each represented on the main island by only one surviving individual, are nationally critical threatened species. *Tecomanthe* has been propagated widely by cuttings and seeds, but as the *Pennantia* is dioecious only clones could be grown. Janeen paid tribute to the work of Ross Beever in manipulating hormones to remedy this sexual imbalance. She spoke of the in-situ population enhancement programme started in 2003 with the aim of achieving self sustaining populations for both species.

June Field Trip

Two bush remnants at Tauhoa were visited to see the results of farmers fencing out stock and undertaking regular pest control. In the morning David Whistler guided us through one of the patches that he has managed for nearly 20 years. Karaka (*Corynocarpus laevigatus*) and nikau (*Rhopalostylis sapida*) saplings were abundant under the largely broadleaf canopy, though a few kauri (*Agathis australis*) were present in one corner. A large tree of maire montana (*Nestegis montana*) was a nice surprise, and a few seedlings of kaikomako (*Pennantia corymbosa*) were present. Lunch was eaten sitting on hay bales on the edge of the Kaipara Harbour at John Lambert's coastal remnant. This graded from mangroves through a healthy salt marsh to coastal bush containing ngaio (*Myoporum laetum*), wharangi (*Melicope ternata*) and a swarm of *Coprosma* hybrids. Weeping matipo (*Myrsine divaricata*) was the special plant of the day.

July Meeting

For the Plant of the Month, carnivorous plant enthusiast, Brian Quinn, spoke of one of our seven *Drosera* species, the endemic *D. stenopetala.*
Last year Ewen Cameron holidayed in the Canary Islands, and the night's talk highlighted the plants that he saw on the two islands that he visited – Tenerife and La Gomara. After an explanation of how the islands were formed off the west coast of Africa by the upwelling of magma from a fault line along the Atlas Mountains, he then outlined the interesting flora of one of the biodiversity hotspots of the world. On Tenerife the presence of El Teide, a mountain as tall as Mt Cook, means that several contrasting vegetation zones contain a varied flora.

July Field Trip
Point View Reserve, Dannemora, near East Tamaki, is another of those surprisingly good Auckland bush remnants surrounded by the trappings of civilisation. Although a great deal of planting had taken place, there was good natural vegetation, including a grove of king fern (*Ptisana salicina*) and a small patch of dense rimu (*Dacrydium cupressinum*). Control of privet (*Ligustrum lucidum*) was obviously an on-going practise.

August Meeting
Kristy Hall, a keen horse woman, celebrated the Olympic equestrian medal by talking about horse's mane weeds, *Ruppia megacarpa* with branching stems and *R. polycarpa* with branching rhizomes.

As a Fulbright Scholar studying at Princeton University Dave Pattemore looked into the role of vertebrates in the pollination of plants. As so many of our birds, reptiles and mammals have become extinct or rare on mainland New Zealand, he compared the pollinators there with those on Hauturu Little Barrier Island. Hauturu still has the full suite of honey eating birds and also the short tailed bat. Over-night video cameras showed that bats are very active pollinators on Hauturu, but on the mainland, rats and silver-eyes take over this task. There is a downside to this, however, as rats eat so many seeds and silver-eyes often rob plants of the nectar.

August Field Trip
Clevedon Scenic Reserve, clothing the hills behind Clevedon Village, has a range of forest types, including taraire forest and kauri groves, with kahikatea growing commonly in the lower reaches. The reserve is well tracked, with robust wooden steps. Seedlings of kaikomako (*Pennantia corymbosa*) were scattered throughout, and several young king ferns (*Ptisana salicina*) grew on the trackside banks. After completing the loop track a short walk to the former quarry revealed the source of the sporeling king ferns – large and small plants lined the stream banks. Few weeds were evident.

FUTURE EVENTS

15 September	Waitakere Ranges, Leader, Sandra Jones
27 October	75th Jubilee
7 November	"Northern & Southern Spain". Alison Wesley & Ewen Cameron
17 November	Saddle Island, Mahurangi Heads. Leader, Ewen Cameron
1 December	Christmas picnic, Auckland Botanic Gardens

Auckland Botanical Society, PO Box 26391, Epsom, Auckland 1344
President: Mike Wilcox
Secretary: Kristy Hall
aucklandbotanicalsociety@gmail.com

- **Rotorua Botanical Society**

June Field Trip: Rangatikei Oxbows Trip
We set out for the southern end of Kaingaroa Forest to four areas scattered along 5 km of the Rangataiki River Headwaters. The first area was a shallow (summer dry?) sedgeland, one of several along this section of the river. It was dominated by *Machaerina rubiginosa*, which we trudged through, the highlight being *Ranunculus macropus* in the deeper water areas. The area was fringed by gorse and manuka along the margins of which were a variety of sedges and herbs currently flooded. Species included very large *Carex echinata*, *C. geminata, C. secta, C. sinclairii, Sparganium subglobosum*, *M. arthrophylla, M. rubiginosa*, *M. tenax*, *Juncus bulbosus, J. edgariae* and *Hydrocotyle pterocarpa*.

Next we drove to a stand of very tall *Olearia virgata* with an understory of *Blechnum novae-zelandiae*,

Sticherus cunninghamii and shrubs such as pokaka, *Corokia cotoneaster* and *Aristotelia fruticosa*. As we backtracked we decided to examine a typical monoao stand with patches of 5m tall kanuka on the higher ground. Highlights included *Raoulia albosericea*, *Coprosma decurva* and sloshing through slippery wet lichen. Our last stop was one of the few stands of bog pine remaining within the forest.

July Field Trip: Matawharu Bluff SR

A good-sized group met on Hongi's track to climb to the cauldera. Discretion prevailed so rather than the steep slippery direct ascent we headed along the shore of Lake Rotoehu and took a gentle route via a farm track and an easy ridge. The route passed through rewarewa and young kamahi forest with the odd mangeao at first with a good variety of ferns and shrubs. As we reached the "summit" plateau the forest changed to tall tawa with large rimu and mangeao. After a long walk along the summit we reached a cliff top trig lookout over Rotoiti. Here there were new scrub plants including manuka, kanuka, *Gaultheria antipoda,* tawari and even pohutukawa*.* Beneath there was *Blechnum vulcanicum, Astelia trinervia, Gahnia paucilflora* and flowers of the tiny orchid, *Diplodium trullifolium*. The long walk back led to a few more discoveries including, after the usual debate, *Cyathea cunninghamii*.

FUTURE EVENTS

9 September	Lathams Track
29-30 September	East Cape revisited
17 November	Waewaetutuki Wetland, Little Waihi Estuary
2 December:	Broken Hills, Coromandel

President*:* Paul Cashmore (07) 348 4421 pcashmore@doc.govt.nz **Secretary:** Elizabeth Miller

- **Taranaki Botany Group**

The first programme of this new group is below. These are all field trips; and alternate between a Sunday and a Thursday. Leaders are the co-convenors of the group, contact details at the end. We would be delighted to welcome any visiting botanists, so please get in touch if you want to join us.

FUTURE EVENTS

16 September	Onaero River Scenic Reserve. Southernmost record of *Metrosideros carminea*; and, we think, *Sophora microphylla* & *S. chathamica* both occur here.
11 October	Arawhata Rd Beach & Stent Rd Beach coastal turfs. Many plants of interest including *Crassula manaia* and the annual *Myosotis brevis.*
11 November	York Rd. Terrestrial *Brachyglottis kirkii*.
6 December	Ahukawakawa Swamp (Mangorei Track). *Melicytus drucei*; *Olearia quinquevulnera*
3 February	Moumahaki Lakes & Catchment KNE near Waverley. *Olearia townsonii* (which should be in flower) is near its southern limit here.

Contacts: Barbara Hammonds 06 7597077; Email: barbara_h@xtra.co.nz
Janica Amoore 06 7520830. Email: waiongona@clear.co.nz

- **Wanganui Museum Botanical Group**

FUTURE EVENTS

2 October	Gordon Park fieldtrip – past, present and future, followed by members' evening (show and tell)
27 October (note change of date)	Hands-on workshop on the family Boraginaceae (forget-me-knots). Colin Ogle.
3 November	Bushy Park fieldtrip. Esther Williams.
1-2 December	Raurimu fieldtrip. Doris Hamling.
4 December	Christmas social evening.

President: Clive Higgie (06) 342 7857 clive.nicki@xtra.co.nz
Secretary: Robyn Ogle (06) 3478547 22 Forres St, Wanganui. robcol.ogle@xtra.co.nz

- **Wellington Botanical Society**

Wairarapa: 3 December 2011

Led by Pat Enright we explored the Mangatoetoe Valley; an interesting area that warrants another visit at another time of year. In the car park was the seldom-seen *Pelargonium inodorum* in flower. On cliff faces and rock outcrops in the valley were *Brachyglottis greyii*, and native fuzzweed (*Vittadinia australis*), in flower. Most orchids were in seed, apart from *Thelymitra longifolia* agg. Jersey fern (*Anogramma leptophylla*) was almost past its best. Locally common were *Coprosma virescens*, the native carrot (*Daucus glochidiatus*), and the small maidenhair fern (*Adiantum aethiopicum*). We found the 'Nationally Critical' *Crassula peduncularis* in an "ephemeral wetland" (really just a large puddle). This brings to four the number of native crassula species in this valley. Also of note was 11 clover species, including the uncommon narrow-leaved clover (*Trifolium angustifolium*).

Taranaki: 20–28 January

Day 1, Gordon Park Scenic Reserve and Waverley beach: The Whanganui Museum Botanical Group led us through the reserve, a swamp forest remnant, near Whanganui. Divaricates including *Melicope simplex* and *Melicytus micranthus* edged the tawa-tītoki canopy near the car park. In the damp, partly-shaded interior we saw the unfamiliar *Gratiola concinna* and patches of *Mazus novaezeelandiae*, *Cardamine* sp., *Callitriche muelleri* and *Stellaria parviflora.*

The coastal turf of Waverley Beach, with its base of *Zoysia minima*, was a wonderful introduction to Taranaki's coastal turfs. We noted one round-tipped leaf *Crassula* that we assumed to be *C. manaia*; to our knowledge, the southern-most record of this species. *Apium prostratum*, *Sarcocornia quinqueflora* and beds of *Selliera radicans* grew near the cliff edge. Other areas were overgrown with planted marram (*Ammophila arenaria*) and catsear (*Hypochaeris radicata*).

Day 2: Kakaramea and Rotokare Reserve: At Kakaramea north of Patea the Kaikoura Stream drops over cliffs at least 30m to the sea. Scattered *Ficinia nodosa* appeared seriously deformed from wind action. Damp recently disturbed areas were covered in mats of *Limosella lineata* in flower, next to beds of *Zoysia minima* supporting *Colobanthus muelleri*. Elsewhere grew *Gunnera arenaria, Lachnagrostis littoralis* and *Leptinella tenella*. Next was Rotokare Reserve, a 230ha native forest 12km east of Eltham. This community project is New Zealand's largest animal pest-free mainland island. Project co-ordinator Kara Prankerd outlined the work of the trust. On the walkway around the lake we identified *Diplazium australe*, *Hypolepis ambigua, Pteris macilenta* and *Paesia scaberula.*

Day 4, North Egmont, Pouakai range and Ahukawakawa swamp: Val Smith led us around the Ngatoro and Veronica loop tracks, and the Nature Walk. The drive from the park boundary indicated a good flowering year for *Cordyline banksii* and *Senecio rufiglandulosus* (a difficult name to remember, until it is broken down to its Latin derivation: *rufus,* fox-red; *glans,* glands-"with small red glands"). At the road-end our initial dismay at the rabbit population, weeds and poor condition of plantings was offset by the prolific flowering of *Olearia ilicifolia,* after which Holly Hut near Ahukawakawa Swamp is named, and robust *Hebe* sp. (*H.* "egmontiana") in bud. We entered gnarled kāmahi "goblin forest" draped with the moss, *Weymouthia mollis,* with other mosses, liverworts and filmy ferns. The lush understorey included *Leptopteris superba*. Terrestrial orchids included *Aporostylis bifolia*, *Simpliglottis cornuta*, *Singularybas oblongus*, *Pterostylis venosa*, *P. humilis*, *P. patens* and *P. irsoniana.* Over our climb the vegetation changed with pāhautea (*Libocedrus bidwillii*) and *Podocarpus cunninghamii* becoming dominant, and then giving way to leatherwood (*Brachyglottis elaeagnifolia*) and *Chionochloa rubra*. At the track edges *Viola cunninghamiii, Oxalis magellanica*, *Myosotis forsteri*, *Lobelia angulata* and *Carmichaelia australis* were in flower. Additions to the plant list included *Fuchsia excorticata*, *Rubus cissoides*, *Viola filicaulis*, *Oreobolus* sp., *Poa anceps*, *P. cita*, *Rytidosperma gracile*, *Uncinia ferruginea*, *Cardiomanes reniforme* and *Hymenophyllum villosum.*

The other half of our group went up the Mangorei Track to Pouakai over to the swamp and back. En route we discussed the distinctions between *Coprosma tayloriae* and *C. dumosa*, bearing in mind the recent work of David Glenny. We saw *Blechnum nigrum*, and learnt to identify *B. novae-zelandiae, B. procerum* and *B. montanum*. Before sidling Photographer's Peak, the trackside vegetation included *Abrotanella linearis*, an unusual daisy because of its small size and composite flower comprises only a few individual florets, and *Gentianella grisebachii.* Other plants included *Cyathea colensoi*, growing close to *C. smithii,* and, on a *Libocedrus bidwillii*, a patch of *Hymenophyllum malingii*. *Pterostylis graminea* was flowering in the forest, and *P. patens* on the more open trackside. Near the hut were tiny blue-green cushions of *Agrostis muscosa*, and flowering *Bulbinella hookerii*. After lunch, some of

us went east towards Henry Peak to see the endemic *Melicytus drucei*. The rest of us headed for Ahukawakawa Swamp were we saw *Carex coriacea, Chionochloa rubra* var. *inermis, Melicytus drucei* and *Olearia quinquavulnera.* A highlights of the day was *Ranunculus nivicola* on the tops.

Day 5: Plateau and ski fields: The walk from the cable-way, along the foot of bluffs in the Manganui River gorge, and up to the ski-field huts, had the usual range of low alpines. Near the tunnel, a major interest was in the coriarias - including *Coriaria pteridoides, C. sarmentosa* and perhaps *C. arborea*. On the bluffs we saw *Wahlengergia pygmaea* var. *pygmaea*. The local *Hebe stricta* var. *egmontiana* was also present. At the bottom of the run, the introduced *Carex ovalis* dominated the wetter parts, with some *Gentianella grisebachii* in flower. Many introduced grasses grow on the drier slopes including *Festuca rubra, Holcus lanatus* and *Anthoxanthum odoratum*. A highlight was mats of flowering *Celmisia gracilenta*.

In a large gully beside the ski-field we found *Deschampsia tenella*, *Trisetum lepidum* agg., *Polystichum cystostegia*, *Cystopteris tasmanica* and *Schizeilema colensoi* in flower. On the upper slopes was an unstable area held together by the matted roots of *Coprosma perpusilla* subsp. *perpusilla*. Hare damage was apparent even up there. *Euphrasia cuneata*, *Forstera tenella*, and *Montia calycina* were in flower. Back on the damp mown area was *Juncus novae-zelandiae* and the finer-leaved *J. pusillus*. There was also scattered *Kelleria dieffenbachia, Gunnera monoica, Microtis parviflora* and *Oreobolus pectinatus*. On the way down Potaema swamp featured huge rimu and kāmahi, *Astelia grandis*, *Gahnia xanthocarpa*, swamp maire, and *Hypolepis rufobarbata*.

Day 6, Coastal herbfields and coastal forest remnant: Though the herbfield remnants are tiny, we could not fit more than three sites in the day. There were small areas of undisturbed turf at Puketapu Road, but most of the cliff top areas are overrun with exotic grasses. There were scattered clumps of *Pimelea carnosa*, and mats of *Agrostis mucosa*. The ledges of a pathway down to the sea were refuges for *Coprosma acerosa*, with *Ficinia nodosa*, *Apium prostratum*, *Tetragonia implexicoma* and *Samolus repens*. Further down was *Asplenium appendiculatum* subsp. *maritimum*.

At the Opunake sewage ponds Kikuyu grass (*Pennesitum clandestinum*) had all but overgrown the herbfields. *Leptinella squalida* was trying to repel the invasion. We saw *Myosotis pigmea* among *Zoysia minima* and scattered *Colobanthus muelleri*. *Disphyma australis* thrives along the cliff edge. At the car park was *Plantago triandra* subsp. *masonii*, *Crassula manaia, Chaerophyllum novae-zelandiae*, *Colobanthus muelleri*, *Ranunculus acaulis* and *Zoysia minima*. Much of the fenced-off area was overrun with white clover but *Lepidium flexicaule* was thriving. Both forms of *Myosotis brevis* were on a small area of turf, and a few plants of what was probably *Dichondra brevifolia*.

At a nearby 2ha coastal forest covenant a battered canopy of kohekohe and tītoki sheltered almost impassable lianes - *Freycinetia banksii*, *Passiflora tetrandra*, *Muehlenbeckia australis* and *Ripogonum scandens* filled every gap. The ground was covered in seedlings of *Rhopalostylis sapida, Knightia excelsa* and *Laurelia novae-zelandiae*, and ferns including *Asplenium bulbiferum*, *A. oblongifolium*, *A. polyodon* and *Deparia petersenii* subsp. *congrua*. Larger trees were covered in epiphytes including *Collospermum microspermum*, *Earina mucronata* and *E. autumnalis.*

Day 7, Toro Road, Purangi: Dean Caskey, Taranaki Regional Council Biodiversity Officer, outlined the history of this 260ha covenant. While one group worked their way up the valley, the rest followed Dean around the ridge tops as he checked the trap lines. *Metrosiderous robusta*, *M. diffusa*, *M. perforata*, *M. fulgens* and *M. colensoi* were all present. Three maire, *Nestegis cunninghamii*, *N. lanceolata* and *N. montana*, and two tōtara; *Podocarpus totara* and *P. cunninghamii* were found, as were *Earina mucronata*, *E. autumnalis* and *Winika cunninghamii*.

In a gully with a small swamp we saw *Hymenophyllum flabellatum*, *H. franklinii* and *H. revolutum*. In the swamp we saw *Uncinia forsteri* and *Carex maorica*, before returning through *Quintinia serrata* and *Laurelia novae-zelandiae,* under which was *Rhabothamnus solandri*. We found *Botrychium biforme* and *Pittosporum cornifolium*. The cliffs were edged with *Dracophyllum strictum* and the track cuttings were covered in *Drosera binata*. On a farm road leading to the eastern ridge the high hilllside banks provided habitat for *Dracophyllum strictum*, *Lycopodium scariosum*, and *Nematoceras oblongus.* Near

the top of the ridge, a flowering *Metrosideros perforata* covered at least 2m². Under the tawa canopy *Blechnum colensoi* was noted on a well-drained spur.

Day 8, Kererū Keep, Tikorangi: Janica Amor led this trip. Neil and Jackie Whitehead explained how they engendered the community to assist with the management of their three QEII bush covenants, each of 3ha. The first block had a canopy of large tawa, kohekohe and pukatea with a few emergent kahikatea and miro. We descended a track lined with king fern (*Ptisana salicina*), then crossed a swamp festooned with *Elatostema rugosa*. Emerging from the bush we saw a lone *Syzygium maire*. The second covenant featured a large rimu, extensive *E. rugosa* and numerous king fern.

FUTURE EVENTS

17 September	Kevin Hackwell "Why the Denniston Plateau is worth fighting for"
29 December-7 January	Field trip: Arthur's Pass. Contact Rodney Lewington (rodneyjl@clear.net.nz) to register expression of interest in attending.

President: Chris Moore, 04 479 3924. Moore.c@xtra.co.nz
Secretary: Barbara Clark, 04 233 8202. Bj_clark@xtra.co.nz. http://wellingtonbotsoc.org.nz/

- **Nelson Botanical Society**

May field trip: A fungal foray at Pelorus Bridge Scenic Reserve
Karen McKay, who studied Fungi in the Pelorus Scenic Reserve for her Teacher Fellowship with the Royal Society of New Zealand, led the trip and explained how the bush was divided into two distinct fungal areas; one under the tawa trees and the other under beech forest. We walked along an undulating track finding many shapes, sizes and colours of fungi including club fungi in cream, yellow, orange and red shades, waxgill fungi, cup fungi and the beautiful emerald green *Gliophorus viridis*, red pouch fungi, bracket fungi, and small *Mycena* species. To see the mauve-purple coral fungus was a first for many of us. One of our group spotted 'stick' emerging from the forest floor, which turned out to be a vegetable caterpillar, *Cordyceps robertsii*. This fungus infects soil dwelling caterpillars and when it has consumed the host caterpillar it sends up a spore-bearing stalk. This was dug up to show the mummified caterpillar attached to the stalk. An earthstar was found and also a large clump of honey fungus (*Armillaria limonea*) on a beech stump.

May evening talk: *Motuora – a small island with a big future* by Helen Lindsay
Motuora is a predator-free island in the Hauraki Gulf and a recreational reserve. Helen began working on Motuora in 1997 and now manages weed control, looks after the nursery, propagation, planning, planting, and organises the volunteers. The island was previously cleared and used as a dairy farm. It came to the Crown in 1966 and was administered by DoC since 1987. Forest and Bird became involved in 1998 and then the Motuora Restoration Society has run it since 2003. In 1999 it became a kiwi crèche. There were few native trees remaining and many species such as taraire, kohekohe, puriri, and tawapou have now been planted. There are giant weta, common and Duvaucel's gecko and it is hoped that diving petrels from Tiritiri Matangi will create a new colony. Young birds were placed in artificial burrows and fed until they fledged. Gannet decoys have been placed on top of a cliff and calls of gannets and fluttering shearwaters transmitted in the hope of attracting these birds. Whiteheads have been successfully introduced and in the future more native species will hopefully make it their home.

June evening talk: The use of pingao and spinifex for dune restoration. David Sissons.
David gave a brief history of New Zealand's coastal flora, explaining the loss of native dune plants, the resulting migration of dunes and the planting of marram and lupins to stabilise them, followed by radiata. He also talked about erosion, the role of natural foredunes and the fact that only about 30% of our dunes remain. Today dune lands are recognised as unique and valuable ecosystems. "Coast Care" is a community-based programme where volunteer groups around the country, supported by DOC, local councils and businesses, are successfully working to restore dunes with native plants, particularly pingao and spinifex to both beautify our beaches and protect the land behind them.

July evening meeting: Crown purchases of areas of biodiversity – Simon Moore.
Simon is a DOC ecologist in Nelson involved with the formal protection of biodiversity on private land. When landowners realise that they have areas of particular interest they are often willing to protect

them by covenant or occasionally sell to the government. First there was the Reserves Act, then the RMA and now councils have taken over much of the lead role in protecting native habitats. The Nature Heritage Fund supports the purchase of special areas. DOC covenants are mainly registered now for threatened species. One special area on d'Urville Island, Moawhitu (Greville Harbour), was purchased by the Nature Heritage Fund, completing a belt of protected natural areas from coast to coast. There is a wide variety of plants and habitats at Moawhitu including depleted ultramafics where an interesting group of plants struggle to survive. Fortunately there are no goats or possums but there are rats, stoats, deer and pigs. Threatened plants include *Melicytus crassifolius, Hebe urvilleana,* and *Sophora molloyi*.

Oaro Scenic Reserve, south of Kaikoura, was purchased in 2002-3. This 71,000ha added to a network of scenic reserves and is a great place for birds. Also in South Marlborough, in the Wairau Valley, Boundary Creek Reserve was created in 2005.This is a very significant area of primary forest. There is a stand of matai and also *Melicope simplex* and *Teucridium parvifolium* which are rare or absent elsewhere in South Marlborough. Simon lastly described a reserve created to protect *Powelliphanta gilliesi brunnea*, one of our carnivorous snails. In 1991 only 150-200 were left in a small area at the mouth of the Patarau River, its only known locality. This 0.3ha coastal scrub remnant now has a rat proof fence around it and the snail population has increased to about 1200. This rescue has been a great example of the landowner, Tom Sturgess, supporting a very important project.

FUTURE EVENTS

16 September	Field Trip: Brown River Scenic Reserve. Leader: Uta Purcell 03 545 0280.
17 September	Evening meeting: Craig Potton speaking about the forests of Poland.
14 October	Threatened Plant Weeding, Inches' property, Wairoa Valley. Leader: Shannel Courtney 03 546 9922
19-22 October	Labour weekend camp to South Marlborough lowland limestones. Leader: Cathy Jones 03 546 9499.
18 November	Editor Hill/Bridle Track, with BBQ afterwards at Sally Warren's bach in Duncan Bay. Leader: Cathy Jones 03 546 9499
14-16 December	Cobb Valley camp. Leader: Diana Pittham 03 545 1985

President: Cathy Jones 03 546 9499. Flat 1/47A Washington Rd, Nelson. cathy.jones@xtra.co.nz
Treasurer: Uta Purcell 03 545 0280. 60 Marybank Rd, Atawhai, Nelson. mupurcell@xtra.co.nz

- **Other Botanical Society Contacts**

Waikato Botanical Society
President: Paula Reeves paula_reeves@wave.co.nz **Secretary:** Kerry Jones km8j1s@gmail.com
Our newsletters are available on http://cber.bio.waikato.ac.nz/Waibotsoc/WaikatoBotSoc.html

Manawatu Botanical Society
Jill Rapson: Ecology Group, Institute of Natural Resources, Massey University, Palmerston North. Ph (06) 350 5799 Ext 7963; G.Rapson@massey.ac.nz

Canterbury Botanical Society
President: Jason Butt (03) 355 8869 PO Box 8212, Riccarton, Christchurch 8440
Secretary: Alice Shanks Website: www.canterburybotanicalsociety.org.nz
Wakatipu Botanical Group
Chairman: Neill Simpson (03) 442 2035
Secretary: Lyn Clendon (03) 442 3153

Botanical Society of Otago
Chairman: David Lyttle djlyttle@ihug.co.nz http://www.botany.otago.ac.nz/bso/
Secretary: Allison Knight, P O Box 6214, Dunedin North.

ANNOUNCEMENTS

- **A celebration of John Buchanan FLS (1819-1898): explorer, artist, botanist and geologist**

Patron: Sir David Skegg

When John Buchanan died in 1898, Sir James Hector wrote that he was: "…one of the greatest naturalists we had ever had in New Zealand". However, Buchanan, who contributed so much over many years to both New Zealand Art and New Zealand Science, has never been publicly recognised and honoured in any fitting way. To redress this imbalance, a multidisciplinary Symposium is to be held at **Knox College, University of Otago, Dunedin, November 29-30, 2012** under the auspices of the Friends of the Knox College Library, to discuss aspects of his life, work and legacy to us.

Organising Committee
Prof. Liam McIlvanney (University of Otago)
Prof. Linda Tyler (University of Auckland)
Dr David Galloway (Landcare Research, Dunedin/ President, Friends of the Knox College Library)
John Timmins (Hewitson Librarian, Knox College)
Sandra Goodchild (Sec./Treas. Friends of the Knox College Library)

PROGRAMME

THURSDAY: 29 November – Day I

8.30	Registration
9.00	Welcome
9.10-10.00	Prof. Liam McIlvanney (Otago University) – The Glasgow background
10.00-11.00	Prof. Linda Tyler (University of Auckland) – The achievement of John Buchanan: a biographical overview
11.00 – 11.30	MORNING TEA
11.30-12.00	Dr Roger Collins (Dunedin) – Buchanan the artist
12.00 – 12.30	Dr Gary Blackman (Dunedin) – John Buchanan's Dunedin
12.30 – 1.00	Dr Donald Kerr (University of Otago) – Buchanan's books
1.00-2.00	LUNCH
2.00 – 2.30	Prof. Ruth Barton (Auckland University) - Theism and transmutation: John Buchanan, Darwin and evolution
2.30 – 3.00	Dr Simon Nathan (GNS, Wellington) John Buchanan, James Hector and the Geological Department
3.00-3.30	AFTERNOON TEA
3.30 – 4.00	Dr Graham Bishop (Dunedin) John Buchanan and Alexander McKay, a geological friendship
4.00 – 4.30	Geoff Norman (Wellington) Buchanan and NZ ornithology
5.30	PUBLIC LECTURE Otago Museum @ the Hutton Theatre Dr Jim Endersby (University of Sussex, Brighton, UK) – "Imperial Science: the invention of New Zealand's plants"

FRIDAY: 30 November – Day II

8.30	Registration
9.00- 9.30	Dr Peter Heenan (Landcare Research, Lincoln) – Buchanan the botanist
9.30-10.00	Dr Kelvin Lloyd (Wildlands, Dunedin) – Retracing Buchanan's botanical journeys in West Otago and Fiordland – a modern perspective
10.30-11.00	MORNING TEA
11.00-11.30	Dr Peter Buchanan (Landcare Research, Auckland) – Buchanan and Fungi
11.30-12.00	Dr David Galloway (Landcare Research. Dunedin) – Buchanan's lichens: James Stirton and the Glasgow connection
12.00 – 12.30	Emeritus Prof Sir Alan Mark (Otago University) – NZ's alpine grasslands since Buchanan's time
12.30 –1.30	LUNCH
1.30-2.00	Sue Scheele (Landcare Research, Lincoln) – Buchanan, Maori and vernacular plant names
2.00-2.30	Prof. Len Bell (University of Auckland) – John Buchanan's collection of photographic images of Maori subjects
2.30 – 3.00	Mr Geoff Bil (Dept of History, University of British Columbia, Vancouver) – TBA
3.00-3.30	AFTERNOON TEA
3.30-4.00	Panel Discussion – "Buchanan in Perspective"
4.00-4.15	Closing Remarks

5.30 Reception and opening of Buchanan Exhibition, "Art in the Service of Science: Dunedin's John Buchanan" Hocken Library Gallery

SATURDAY (morning): 1 December - Day III - A Buchanan walk to sights of interest. His house/property in NE Valley, and his grave in the Northern Cemetery.

For enquiries and details regarding registration:
The Hewitson Libraria
Knox College, Arden Street, Opoho
DUNEDIN 9010
Tel: 03 473 0771 Email: hewitson@knoxcollege.ac.nz

NOTES AND REPORTS

- ***Dactylanthus taylorii* flowers in threatened plant garden**

Elizabeth Overdyck, eg3@waikato.ac.nz

The rare and unusual root parasite *Dactylanthus taylorii* (dactylanthus) has established from seed sown by the Waikato Botanical Society in the society's Threatened Plant Garden on the Waikato University campus. Inflorescences were found for the first time this summer confirming successful establishment 5 years after seeds were sown. The seed had been collected in Pureora Forest Park and sown with the help of DOC's Dr Avi Holzapfel. Thousands of tiny seeds were sown in three sites under *Myrsine australis* and *Pittosporum tenuifolium*, with dactylanthus successfully establishing under the latter species. Twenty-seven female inflorescences were counted. As the main body of dactylanthus, a tuber, grows under the surface, it is often difficult to tell how many plants are at a site. However, because the inflorescences were arranged in a single ring-pattern, it seems likely that they all came from a single tuber. The time of emergence after sowing might seem long but is consistent with recent seed-sowing trials in the wild, where first emergence was noted 4 years after sowing. Here, too, the majority of inflorescences were female, in contrast to established populations where male inflorescences dominate. Given the number of inflorescences and the size of the ring these formed on the ground, it is possible flowering could have occurred already in the previous year but had not been detected. Some seeds were also experimentally sown into two large pots in 2007 with *Melicytus ramiflorus* and *Pittosporum colensoi* host trees, but these have shown no signs of establishment yet.

The successful cultivation of dactylanthus in a garden situation is very exciting for this unique species, which is threatened in the wild due to habitat loss and recruitment failure because of browsing of the inflorescences by possums, rats and pigs. Establishing a population at an educational institute will hopefully provide great opportunities for future research and advocacy for dactylanthus. The use of hand pollination will be considered next year to encourage seed set on the existing plant, so we will be watching very closely for the re-emergence of flowers.

- **Abbreviated Annual Report of Te Papa's herbarium, WELT, 2011/2012**

Leon Perrie, leonp@tepapa.govt.nz; 04 381 7261; Te Papa, PO Box 467, Wellington 6011.

Staff
Permanent: Jennifer Dalen (Collection Manager), Antony Kusabs (Collection Manager), Carlos Lehnebach (Curator), Leon Perrie (Curator), with part-time technical support from Kent Chamberlain (Technician) and Matthew Chaplin (Technician).
Contract: Patrick Brownsey (Research Fellow), Helen Mechen (Technician), Heidi Meudt (Research Scientist), Barry Sneddon (Collection Manager), Julia Wilson-Davey (Data Officer).
Research Associates: Peter Beveridge (bryophytes), Wendy Nelson (NIWA, marine algae), Barbara Polly (lichens), Barry Sneddon (flowering plants).
Students & Fellows: Michael Gemmell (MSc, Victoria), Wendy Hogg (RSNZ Primary Science Teacher Fellow), Jessica Prebble (PhD, Massey).
Volunteers: Lydia Chin (mounting).

Support

Additional responsibilities: including Threatened Bryophyte committee (Pat), NZ Virtual Herbarium governance group (Pat), postgraduate supervision (Heidi, Carlos, Leon), editorial capacity (Pat – *Tuhinga*, Leon – *Australian Systematic Botany* and *Wellington Botanical Society Bulletin*).
Exhibitions: Botanical contributions to: *Oceania: Early Encounters* (Banks & Solander specimens); *Tai timu, tai pari, Tainui: Journey of a people* (King Tawhiao's ferns); Tairawhiti Museum's transit of Venus exhibition (Banks & Solander specimens).
Enquiries: 198 (130 professional, 46 public, 22 internal).
Tours: 21, comprising 156 people.
Visitors: 71, from 42 visits.
Collections Online: notable additions are Te Papa's list of New Zealand marine macroalgae; common New Zealand ferns; Te Papa's list of Fijian ferns. All databased specimens of non-threatened species now viewable at **http://collections.tepapa.govt.nz/**.
Te Papa Blog: 30 posts, see **http://blog.tepapa.govt.nz/category/plants/**

Collection Management

Loans: Outgoing – 15 sent (213 specimens, 9 institutions), 18 returned (635, 13); Incoming – 20 received (957, 8), 16 returned (559, 8).
New accessions of specimens: 967 Te Papa field collections (Bryophyte Workshop 674, Landcare subcontract research 146, other 147); 495 incoming exchanges (mainly AK 430), 4017 donations/gifts (including WELTU from Victoria University of Wellington 3541, NIWA 200, Don McLean 50, Joe Zuccarello 44).
Collection and database summary: total specimens c. 270000; total registered 211953; total databased 157370 (all indigenous lichens, bryophytes, ferns, and gymnosperms, and c. 2/3 angiosperms).
12057 new specimens were added to the database in 2010/2011 (includes backlog and new registrations) – 757 algae, 198 liverworts, 74 lichens, 539 mosses, 399 ferns, 10090 seed plants.
The families with the largest addition of databased records (largely reflecting backlog databasing): Apiaceae (3988), Asteraceae (2585), Pittosporaceae (792), Violaceae (673), Onagraceae (543), Plantaginaceae (431), Scrophulariaceae (381), Rosaceae (378), Rhamnaceae (357), Oleaceae (347).

Scientific Research

Programmes: systematics of marine algae (Jenn), New Zealand and Pacific ferns (Pat and Leon), *Plantago* (Heidi), *Myosotis* (Heidi, Carlos, and Jessie), *Nematoceras* (Carlos), and *Pseudopanax* (Leon).
Publications: 12 peer-reviewed (**http://collections.tepapa.govt.nz/theme.aspx?irn=2309**), 5 popular, 13 conference and community presentations.

- **The biostatus of *Pteris vittata* in New Zealand: response to Brownsey & Perrie (NZ Botanical Society Newsletter No. 108, p. 19-21.)**

Chris Ecroyd, 72 Chelsea Ave, Richmond, 7020, ecroyd@orcon.net.nz, and **Elizabeth Miller**, Scion, Private Bag 3020, Rotorua, Elizabeth.Miller@scionresearch.com

Brownsey & Perrie (2012) discuss the biostatus of *Pteris vittata* in New Zealand and conclude that "the plant should be recognised as naturalised rather than as a coloniser". They correctly state that Ecroyd observed the species on the banks of Lake Rotomahana in 2007 where it was growing very close to hot springs in an area likely to be frost-free. This location is 19 km south-east of Rotorua, more than 4 km from the nearest house. Because it is in an area of steep, unstable ground and geothermal activity, access is very difficult except by boat. The most likely way it could have reached this site is from wind-blown spores.

Pteris vittata is a relatively new arrival at Lake Rotomahana growing on a site previously searched several times since the early 1970s. The geothermal areas between Rotorua and Taupo and in the wider Bay of Plenty were checked diligently during the 1970s and 1980s for less common plant species, and various ferns recorded. These surveys included several boat trips around Lake Rotomahana. If *P. vittata* had been present at that time, it must have been very small and inconspicuous, under other vegetation, unlike the conspicuous colony seen in 2007.

It has been suggested (J.F.F. Hobbs pers. comm.) that it could perhaps have been introduced to the area on contaminated clothing or horse feed when horses were used to take tourists to the Pink and

White Terraces located on the shores of the former, much smaller Lake Rotomahana, but it would have had to survive the Mt. Tarawera eruption and remain unseen for more than 120 years. The area was completely changed by the eruption in 1886 (*after* Buchanan's report in 1882), which formed a deep crater where the original Rotomahana had been, and blanketed the region in thick ash. Re-colonisation would be more probable than survival. Given that the prevailing wind direction is westerly and that the species is "common in Eastern Australia" (Brownsey & Perrie 2012) it is far more likely that *P. vittata* has recently self-established in New Zealand from Australia.

Fig. 1 John Hobbs at the hot springs site at Tarawera near the Napier-Taupo Highway in 2007.

Brownsey & Perrie (2012) draw attention to the specimens discovered in Auckland and Napier, as described by Cameron & Parris (1998), and considered to be naturalisations from cultivated material. Occasional easterly storms could possibly have been a carrier of spores from the Hawke's Bay direction, but the known populations are small, reducing the likelihood of these being the source of the Rotomahana population. Easterly and south-easterly winds tend to drop rain on the eastern side of the ranges which would not be conducive to the transport of wind-borne spores. There is also a remote chance that spores could blow to Rotomahana from the few plants growing around the Auckland region but considering wind direction required and population size this appears far less likely than arrival from the much larger eastern Australian populations. The dispersal of biological material from Australia is well documented (Close et al. 1978). Other species which have self-established in the Rotorua district from Australia are the orchids *Simpliglottis valida* and *Sullivania minor*.

Pteris vittata is not the only fern to have recently established near Lake Rotomahana. It has been interesting to note the establishment of other fern species at new sites in the nearby Waimangu geothermal area since the early 1970s, especially *Dicranopteris linearis,* recorded from Rotomahana prior to the Tarawera eruption, but not seen in the vicinity for almost a century, although present in other geothermal areas in the Rotorua-Taupo geothermal region.

Small plant populations at specialised sites can be somewhat ephemeral. Local examples include fern populations at geothermal sites e.g. *Thelypteris confluens* at Rotoehu, reported and vouchered (NZFRI 12626) in the 1980s but not re-located recently. A similar situation is likely to have occurred with an historic population of *P. vittata* (if, in fact, it was that species), at Tarawera on the Napier-Taupo road as geothermal activity has waned.

Brownsey & Perrie (2012) state "that an assumption has been made that Buchanan's record came from Lake Tarawera". We certainly did not make this assumption and in fact, with the assistance of John Hobbs, the sites of two hot springs at Tarawera, close to the Napier-Taupo highway (some 90 km to the south of Lake Tarawera) were explored for *P. vittata* in September 2007 (see Fig. 1). This was considered more likely than Lake Tarawera to be the place that Buchanan (1882) mentioned as the site of *P. longifolia* L. *Pteris longifolia* was at this time confused with *P. vittata*. Cheeseman (1925) specifically refers to the Buchanan (1882) record 'stated to have been gathered at Tarawera, between Napier and Taupo, but of which there are no indigenous specimens in any New Zealand herbarium.'

Although *P. vittata* might have grown at the geothermal site near the Napier-Taupo Highway in the 1870s the site is now highly modified with very little surface geothermal activity and it is very doubtful whether there is any suitable habitat for this species. It is not currently known from any geothermal areas in New Zealand other than at Lake Rotomahana.
Pteris vittata is indigenous to, and very widespread, in tropical to warm-temperate parts of Asia, tropical Africa, Australia (Kramer & McCarthy 1998) and on many Pacific Islands (AK 177739, AK157186 etc.). It is naturalised in areas such as the Southern United States, West Indies and South America (Nauman 1993; Cameron & Parris 1998).

It is suggested that *P. vittata* is quite different in habitat preferences to the widely naturalised *P. cretica* and unlikely to become widespread. Barbara Parris (pers. comm.) suggests that in her

experience "*P. vittata* is much more demanding in its growth requirements than *P. cretica*; the former dies in my acid garden clay, while the latter flourishes and self-sows." Perhaps both species were cultivated in New Zealand in the in the late 19th century but *P. cretica* was found naturalised near Taupo (Tapuaeharuru) as early as 1872 (Colenso 1881). The specimen supporting this record (AK 135538), the type specimen for *P. lomarioides* reported as "not seen" by Brownsey & Perrie (2012) was found and confirmed as *P. cretica.*

It has been suggested that *P. vittata* is associated with calcareous habitats such as concrete structures and cracks in buildings (Nauman 1993) but Bostock (pers. comm.) who is familiar with the species in Australia suggests that it is "happiest when the toxic load is greatest". This includes sites with high arsenic content but with a moderately good water supply. *Pteris vittata* can concentrate arsenic to very high levels and has been used in phytoremediation. The pH of the soil in which the *P. vittata* at Rotomahana was growing near a geothermal vent, was 6.1, which is slightly acidic. It seems probable because of its tropical origins and the sites such as brick and scoria walls from which it is recorded in New Zealand, that a warm substrate is preferred.

Our conclusion is that the source of the Rotomahana colony of *P. vittata* is speculative, but direct wind-blown arrival from Eastern Australia cannot be ruled out, and seems much more likely than spread from other material cultivated or naturalised in New Zealand. Although clearly naturalised in urban areas, *P. vittata* should be recognised as a self-established species in the Lake Rotomahana area, which is unlikely to spread beyond the geothermal areas or other suitable warm habitats and could in future be a useful species for remediation of contaminated frost-free sites.

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- **Lichen notes 3: Lichens in our cemeteries**

David Galloway, Landcare Research, Private Bag 1930, Dunedin 9054 gallowayd@xtra.co.nz

In cemeteries lichens form mosaics of colour, especially on stonework or old iron railings, adding to the character and scientific interest of these environments. They vary in form from simple, powdery scatterings and crusts to more elaborate leafy or even bushy structures. Although they contribute a major addition to the living landscape of a cemetery (increasing in numbers and diversity as the cemetery ages), they are, to a large extent, overlooked or worse, actively removed from headstones by enthusiastic "cemetery tidiers" as being unsightly encumbrances. Admittedly an active lichen growth can obscure the inscription, as has happened spectacularly on the grave of Dr Andrew Sinclair on the Rangitata riverbed at Mesopotamia Station. But in this particular case, I am sure that the incumbent would be grateful for the lichen covering that decorates so completely, the outward surface of his final resting place. More of Sinclair's grave below. However, it is important to realise that the largely undisturbed surfaces present in a cemetery, offer a living indicator or response yardstick of local environmental conditions, over time, for development of lichen communities, that have a fascinating story to tell if we but know how to "read" it. The ecological/environmental possibilities inherent in lichen communities in cemeteries are discussed further below.

Being an Opoho resident and a dog-owner, most mornings I take our Jack Russell terrier for a walk around the perimeter of the Alhambra Rugby Club playing field and into the upper reaches of Dunedin's Northern Cemetery. This cemetery was opened in 1872 and is home to a plethora of illustrious southern personalities (the botanist John Buchanan has his grave there for example) and is dominated by the splendidly restored mausoleum designed by the famed Dunedin architect, R.A. Lawson (also buried in the Cemetery) for the family of the politician William Larnach. The Larnach tomb, which is a kind of First Church in miniature, was completed in 1881 and is largely constructed of Oamaru Stone, a pale honey-coloured limestone that seems not to have very many lichens on it. However, the stone coping separating the mausoleum from the surrounding mown grass paths and which provides a supporting base for the elaborate cast-iron railings surrounding the mausoleum, has a rich covering of lichens. One of these proved to be *Trapelia placodioides*, a lichen not recorded previously from New Zealand. Subsequent searches showed this lichen to be surprisingly common beneath old rusty railings in the Northern Cemetery and it also occurs in similar, iron-rich habitats in Dunedin's older Southern Cemetery (dating from 1858) (see Galloway & Ledingham 2012). Late last year I found it also on an old grave in Napier's historic cemetery (Pope 2008). On closer investigation, other iron-rich lichens were found in Dunedin's Northern Cemetery, *Acarospora sinopica, Lecanora epanora* and *L. handelii*, all first records for New Zealand. On basic rock grave surrounds in the Southern Cemetery, healthy colonies of *Lecanora campestris* were found, another first record for New Zealand. It therefore seemed sensible to start a lichen list for the Northern Cemetery and also to undertake surveys in the other cemeteries that are included within Dunedin's city boundary. This is work in progress and will be discussed in more detail in a future instalment of this occasional series of lichen essays.

When I worked in the Lichen Section of the Natural History Museum in London (1973-1994), two of my Museum colleagues, Jack Laundon and the late Frank Brightman (1921-1996), used to take a guided lichen "wall tour" in Kent every year, that attracted a devoted following. This soon developed into a wider appreciation of lichens growing on the walls of churches and on the walls and headstones of surrounding churchyards (Greenoak 1985; Gilbert 2000). By 1990, interest was such that a separate Churchyard Lichen Group formed under the enthusiastic leadership of the late Tom Chester, and this interest group has gone from strength to strength (Chester 1994, 1999, 2002; Pedley 2004). Frank Dobson published a field guide to the more common lichens found in and around churchyards (Dobson 2003) and Janet Ledingham and I are currently planning a similar introductory illustrated guide to lichens in New Zealand cemeteries, to help generate a wider interest in these fascinating symbiotic associations that are often so richly developed in our cemeteries and what they might be telling us of conditions there. The British Lichen Society maintain a very useful section on Churchyard Lichens on their website, www.britishlichensocity.org.uk and it is well worth looking up.

Cemeteries interest lichenologists for several reasons. They provide a stable, unchanging environment (often of long continuity) for lichens. They have a variety of substrata suitable for lichen establishment and growth (concrete, stone, glass, iron railings, worked wood, trees (trunks, branches and twigs), paths, exposed soil, clay banks, fences and buildings). Headstones provide dated surfaces from which useful information on lichen growth rates can be obtained. And some of our long-established cemeteries (such as the Northern and Southern Cemeteries in Dunedin) have such lichens as *Acarospora sinopica* and *Trapelia placodioides* (see above) that are extremely rare, if not largely unknown elsewhere in New Zealand. Long-established cemeteries may have 50 to 100 or more different lichens, which is a surprising tranche of biodiversity in a relatively small area. Lichens respond to underlying geology, texture, pH and composition as well as to aspect, local climate and atmospheric pollution, so that lichen communities in our cemeteries constitute a unique, but as yet a much neglected, resource for the study of local environmental conditions.

Lichens are important elements in our landscapes since they have vital roles to play in monitoring various environmental changes (atmospheric and terrestrial pollution, ozone depletion, radionuclide and heavy metal accumulation, and global warming for example), as well as being useful biological fertilizers (many of them are nitrogen fixers, utilising cyanobacterial nitrogenase) and early components of plant successions (Galloway 2012a). For far too long they have been neglected by both professional and amateur botanists and naturalists, but this period of "lichen ignorance" is now coming to an end as many special-interest groups (such as local Botanical Societies, Forest & Bird groups and U3A classes for example) come to realize the importance of lichens in so many of our rural, urban and natural environments.

I would be very interested to hear from anyone regarding a cemetery in their area, with any observations or queries that they may have. Do start poking around in cemeteries and look at the lichen communities developed there, you may well be surprised at what you turn up. To help things along I append a list of lichens that grow in some of the cemeteries that I have visited to date – if their names don't mean much, then look them up in the NZ Lichen Flora (Galloway 2007), or in some of the books and papers referenced below. So what lichens might we find in a New Zealand cemetery? Here is a preliminary list from a range of New Zealand cemeteries, from Te Hapua in North Auckland our most northerly cemetery spectacularly placed overlooking the Parengarenga Harbour, to Oban on Stewart Island, again with a wondrous sea view. Others will doubtless be added once more cemeteries are looked at carefully.

Lichens to look out for in New Zealand cemeteries

*Acarospora fuscata, A. sinopica, Amandinea punctata, Arthonia lapidicola, Aspicilia calcarea, Austroparmelina labrosa, Bacidia subcerina, Bagliettoa baldensis, ?Belonia nidarosiensis, Bilimbia sabuletorum, Buellia aethalea, B. dunedina, B. griseovirens, B. subdisciformis, B. stellulata, Caloplaca citrina, C. decipiens, C. holocarpa, C. saxicola, ?C. teicholyta, Candelaria concolor, Candelariella vitellina, C. xanthostigma, Chrysothrix candelaris, Cladia aggregata, Cladonia chlorophaea, C. darwinii, C. neozelandica, C. pyxidata, Clauzadea monticola, Collema crispum, Diploschistes muscorum, D. scruposus, ?Diplotomma alboatrum, D. hedinii, Flavoparmelia haysomii, Hyperphyscia adglutinata, Hypogymnia subphysodes, Hypotrachyna, Jackelixia ligulata, Lecania erysibe, Lecanora albescens, L. campestris, L. carpinea, L. dispersa, L. epanora, L. galactiniza, L. handelii, L. intricata, L. polytropa, L. rupicola, L. semipallida, Lecidea fuscoatrula, L. lapicida, ?L. lithophila, Lecidella scabra, Leparia chrysodeta, L. incana, L. lobificans, L. vouauxii, Leptogium crispatellum, Menegazzia neozelandica, M. subpertusa, Micarea peliocarpa, Parmelia cunninghamii, P. sulcata, Parmotrema perlatum, P. reticulatum, Peltigera degenii, P. didactyla, P. dolichorhiza, P. membranacea, P. tereziana, *Phacopsis oxyspora* (on *Punctelia subrudecta*), *Phaeophyscia orbicularis, Physcia adscendens, P. caesia, P. dubia, P. poncinsii, P. undulata, Placopsis cribellans, P. perrugosa, Placynthium nigrum, Polysporina simplex, Porpidia crustulata, P. macrocarpa. ?P. soredizodes, P. tuberculosa, Protoblastenia rupestris, Pseudocyphellaria crocata, Psilolechia lucida, Psorotichia schaereri, Punctelia borreri, P. subrudecta, Ramalina celastri, Ramboldia petraeoides, Rhizocarpon geographicum, R. grande, Sarcogyne regularis, Scoliciosporum umbrinum, Stereocaulon ramulosum, Teloschistes chrysophthalmus, T. velifer, Tephromela atra, Trapelia placodioides, Trapeliopsis flexuosa, Tremolechia atrata, Usnea cornuta, U. inermis, U. rubicunda, Verrucaria nigrescens, Xanthoparmelia scabrosa, X. verisidosa, Xanthoria parietina* and *X. polycarpa.*

Possibly New Zealand's most lichen-rich gravestone?

Out among the stunted matagouri bushes on the exposed bed of the Rangitata River at Mesopotamia lies the grave of Dr Andrew Sinclair (1796-1861). The inscription reads "In memory of Andrew Sinclair, M.D., late secretary to the General Government of New Zealand under the administration of Sir George Grey, He was drowned crossing the Rangitata on the 1 April, 1861 (Maling 1960: 22). Today, much of this inscription is obliterated by an almost continuous mosaic of crustose lichens, but a number of the words are still visible, albeit with difficulty. The date mentioned on the gravestone of 1 April 1861, is incorrect as it was 26 March when Sinclair was drowned and he was buried on 29 March (Haast 1948; Galloway 1976, 2012b, see figs 1 & 2; Burrows 2005). The gravestone is one of the most lichen-rich in the country and very probably also one of the most densely lichen-covered comprising species of *Acarospora, Aspicilia, Caloplaca, Candelariella, Diploschistes, Immersaria, Lecanora, Lecidea, Ramboldia, Rhizocarpon, Rinodina, Tephromela, Usnea* and *Xanthoparmelia*. Interestingly too, it is very close to the type locality of the lichen *Usnea ciliifera* Mot. (Motyka 1937; Galloway 1985, 2007). The type specimen in Vienna's Natural History Museum was collected by Sinclair and sent to the Museum by Haast, and is annotated "Am Rangitata Flusse bei der Leiche" which translates as "from the Rangitata River near the grave" [of Andrew Sinclair]. Thus, a lichen collected by Sinclair just before his untimely death by drowning, commemorates both the man and also his final resting place.

So next time you walk through or drive past a cemetery, stop for a while and take some time to look at the lichen communities growing there. Tune in to the slow, calm, long-lived story they may be telling you. I'll let a British Lichen Society friend, the late Tom Chester, have the last word "…lichen colonies [are] minute, self-maintaining gardens that provide a natural cladding for the stone. They are beautiful, endlessly fascinating, especially when viewed through a hand-lens. Stone denuded of them looks cold and impersonal. Like those of us who come to churchyards [or in our case, cemeteries] for many and varied reasons, they thrive best in a stable, undisturbed and *healthy* environment. If we care for these

places of rest and spiritual refreshment, we will show both respect for death and reverence for life in all its forms. Please help by allowing the lichens to rest in peace" (Chester & Palmer 1994).

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- **"Hoping to hear from you soon…": John Ross's letters to John Buchanan (1860-1867), an early Glasgow-Otago botanical connection. Part I (9 May 1860 – 6 August 1861)**

David Galloway, Landcare Research, Private Bag 1930, Dunedin 9054, gallowayd@xtra.co.nz

John Buchanan (1819-1898) emigrated from Glasgow in 1851 on the sailing ship *Columbus* reaching Dunedin, the bustling young capital of Otago in February 1852. From the late 1850s until 1862, when he joined James Hector's Otago Geological Survey, he collected plants from the environs of his property in North East Valley, Dunedin, and from the Tuapeka, for Dr John Ross (1808-1871) of Busby [a village in East Renfrewshire and now part of greater Glasgow], who in turn sent the Otago mosses to William Wilson[1] (1799-1871) in Paddington near Warrington, and the ferns, flowering plants and seaweeds to Prof. George Walker Arnott[2] (1799-1868) in Glasgow. These collections, discussed in 18 letters from Ross to Buchanan and from Ross to Wilson and Walker Arnott, shed light on Buchanan's ability as a self-taught botanical collector and are a valuable record of some of the earliest botanical collections made from eastern Otago. Indeed, by May 1860, Ross was to write to Buchanan "…Between Wilson and Arnott you will soon be (if you are not already) the best Cryptogamic Botanist in New Zealand" (see below). The Ross-Buchanan letters[3] show also how Buchanan was selected to join Hector's Otago Geological Survey staff in 1862. It has not been possible to trace the whereabouts of the specimens that Buchanan sent to John Ross, though there

possibly may be material in the William Wilson collection at the BM, and in Walker Arnott's collections at E. Any of Buchanan's personal collections from this time appear not to have survived (see Adams 1990b, 2000).

Although many of the details of John Buchanan's early life are now fairly well known (see Hamlin 1966; Adams 1990a, 1990b, 2000), details of John Ross's life are much more sketchy. John Scott Macvicar, an East Renfrewshire local historian has extensively researched Busby Village, its industries and its notable people and his still unpublished books (Macvicar 2005, 2011), provide the most useful information on John Ross. Dr John Ross (1808-1871) became a medical licentiate in June 1828 and soon afterwards commenced practice in Busby. For the ensuing 40 years he dedicated himself to the health and well being of the people of Busby. In 1844 he established the first bank in the village, a branch of the National Security Savings Bank, which was established in 1836 "to provide for the safe custody and increase in small savings belonging to the industrious classes". In February 1852, Ross founded the Busby Penny Savings Bank. It was thought a penny bank "would be useful in training the juvenile portion of the community to habits of economy and foresight". A subscription was raised in the village in order to provide 6% interest on all deposits, and Busby came to be seen as the most successful of all "penny banks" (Ross 2002:32).

John Ross was also much interested in Botany, collecting local plants, building up a library of botanical books and corresponding with some of the leading botanists of the day. In his youth as a medical student he no doubt came under the lively botanical influence of William Jackson Hooker (1785-1865) who was Regius Professor of Botany at Glasgow University from 1820 until 1841 when he was appointed first official Director of the Royal Garden at Kew (Galloway 2004; Endersby 2008). He was also friend and mentor to John Buchanan and his circle of friends from the drawing shop of Henry Monteith & Co, and no doubt introduced them to interested botanists active in Glasgow at that time such as Roger Hennedy[4], William Gourlie[5] and William Keddie[6]. He would also have very likely accompanied them on the field excursions that were then such an established part of botanical education (Allen 2000).

Since the contents of the Ross letters throw light onto both John Buchanan's botanical collecting and collections *before* he joined James Hector's Otago Geological Survey staff in 1862, and also onto the early history of Otago Botany, they are reproduced here in full, rather than the selected tantalizing glimpses of their content given in Nancy Adams's earlier excellent accounts of Buchanan where John Ross is first presented to us as Buchanan's friend and mentor (Adams 1990b, 2002). For reasons of space, the letters to Buchanan from John Ross are divided - this part records the first 9 letters received by Buchanan, from May 1860 to 17 July 1861. The remaining 9 letters, additional notes, acknowledgements and text references will appear in the next issue. The letters all open formally with "My Dear Sir" and conclude optimistically with "Hoping to hear from you soon…". Buchanan's letters to Ross, which would of course be extremely informative and valuable to have, appear not to have survived.

The Letters

(1) "…Busby 9 May 1860

My Dear Sir

I received your letters containing the Mosses Ferns and Hepaticae but in consequence of being confined to bed at the time I could not write you sooner. I have transmitted to Mr Wilson the mosses of which he wished specimens telling him it was all you had at the time but when those growing were ripe you would send a plentiful supply. I also sent all the new Mosses and Hepaticae with the request that he would furnish me with the name to each number. When he writes I will immediately transmit the information to you.

With regard to the Ferns I have compared them with those in my collection (a number of New Zealand ones which I got from the late Mr Gourlie) and can give you the names of some of them. Those whose names I do not give I will send to Professor Arnott or some other Botanist in order to get the names

A Polypodium grammitis Br.
B Hymenophyllum minimum A.Rich.
C (I don't know)
D Polypodium avium
E probably a variety of Asplenium laetum
F Asplenium laetum
G Asplenium glabellifolium

H Adiantum setulosum
I Hymenophyllum demissum
J Hymenophyllum multifidum
K Niphobolus bicolor
L I have never seen & hope it is new – it bears some resemblance to Hymenophyllum varium but it is serrated or toothed and is rather a [illegible]
M is like a fern. It is a pity it wants fruit – however I will send it with the other two. I have examined the leaves of No's 27, 39 & 53 thro the microscope and must say that they bear a considerable resemblance to one another, they are all nerveless, all falcate and none of them appear to be serrated. No. 53 however is much broader and shorter than the rest or cordato-ovate falcate shortly acuminate; 38 the longest & narrowest being linear lanceolate falcate & peliform, 27 somewhat between the two, the capsule of 39 is however different in shape from 27 and there may be other points of difference only to be noticed after reading the description. I must try and get some work on the subject. Hoping to hear from you soon & with best wishes. I remain
Yours very truly
John Ross

PS I think I mentioned to you that Mr Keddie read your geological letter sent to me to the Glasgow Philosophical Society[7] and shewed your Photographs. He was to write me and give an account of the discussion which followed which he has not done – I must write him about it and send you word in my next… JR…"

(2) "…Busby 21 May 1860
My Dear Sir

After my last letter of the 9th Instant I sent the four ferns which I did not know C, E, L & M to Professor Arnott requesting to have the names and had the following answer.

"…C is Asplenium flaccidum Forst. (Coenoptera flaccidum Linn. and Darea flaccida Willd.) It is a most variable plant, sometimes pendulous from trees sometimes rect.
E is Asplenium obtusatum Forst. a species which in New Zealand takes the place of Asplenium marinum with us,
I is Hymenophyllum tunbridgense var. β cupressiforme Hooker it is the Hymen. tunbridgium Brown Prod. Pl. Nov. Holl. and also Hymen. cupressiforme Labill. and Hymen. revolutum Colenso
M is the seedling of some fern which one it is difficult to say. There are however only two in New Zealand which I think likely to produce young plants like this. The one is Gymnogramme leptophylla Sw. (the Gymn. Novae Zelandiae of Colenso) the other Asplenium flabellifolium. The last is the most probable."

I will feel obliged by you sending me a specimen of E when you fall in with it, as Dr Arnott kept the one sent.

In his letter Dr Arnott says "…You might impress on your friend that to send single specimens so far is next to useless…In general Botanists make it a rule never to name specimens for others unless a corresponding specimen is kept for their own Herbarium. This is necessary on account of the way species are now split up so that what the Botanist nay consider a mere variety of another, a second will maintain to be different, and therefore no Botanist will hold himself responsible for what he does not actually possess and keeps a proof of his corrections. When therefore specimens are sent to this country it is absolutely necessary to send duplicates. Indeed it is only a few marked species that can be made out from single specimens." Dr Arnott then says "…I wish you could induce your friend to send you (for me) such small sea weeds as he finds on the rocks especially those which are what are called dirty; that is not dirty with mud but with microscopical parasites. They ought not to be spread out on paper nor even washed in fresh water, but sent in the rough after being hung up in the air (on a string) to dry.."

In reply to this I immediately wrote Dr. Arnott saying that as you was very fond of knowing the name of every plant you saw (especially cryptogamic) if he would have the kindness to name all the sea weeds you sent, I was pretty sure he would have a plentiful supply. That your attention hitherto had mainly been directed to Mosses and Ferns but I thought you would readily include sea weeds also if you saw a prospect of getting forward.

Enclosed in this letter I sent the only New Zealand sea weeds I had (eight in number) to him and requested him to name them saying I would send them to you to start you in the new line.

After two days I got as letter from him complaining that the specimens were imperfect and that he found some difficulty with them. In this note he says "…If the specimens are so prepared that I can easily determine the Genus then I have only to go to the Genus in my Herbarium and see if I have it but if it is not well dried (and all Algae that adhere to paper ought to be accompanied by a

piece with fruit or laid out on slips of mica or talc for in no other way can they be examined by the microscope without destroying the whole species) no one can name them. No good specimens of Algae can be picked up on the beach, the dashing of the waves often breaking them or destroying quite their proper appearance. Your friend should collect his specimens in the pools in the rocks or attached to large Algae. Also let him throw away all those that are not in fruit. Even if correctly named these can be of no use, but it is next to impossible to name them. There is but one Book to guide us. Hooker's Antarctic Flora[8] where the Algae were done by Harvey[9].

I believe I have got specimens of most of them but if I cannot determine the Genus by the Microscope and the book it is impossible to find it in my Herbarium".

In a letter which I received next day (yesterday) he says "…Since I wrote you I have endeavoured by means of Hooker's Antarctic Flora and my Herbarium to make out the names of the Algae sent but the names may be wrong in consequence of the want of fruit and the plants not being in their usual or normal condition. If there had been anything remarkable in them I would have sent them to my Friend Dr. Harvey who wrote the part containing the Algae for Dr Hooker's Antarctic Flora but even he I suspect would have returned them without names for the trouble in naming half a dozen isolated specimens is as much as to name a large collection and never so certain as when there are 10 or 20 specimens of each because then the varieties of each are seen and besides there is no temptation for any one to give up three or four days or more to single specimens. In mercantile Muscology "it does not pay" at least does not repay one. In my own collection I have had single specimens from the coast of Peru, Martinique etc these thirty years and neither Harvey nor I could make out satisfactorily what to call them. Had we possessed 20 or 30 of each and of a sufficient number of species to illustrate all the algae of the particular coast one might have an inducement to examine them carefully & study them". Dr Arnott has retained all the specimens I sent but as I kept little bits of each I send the specimens with the numbers and names and also his remarks on each.

1 Is Codium tomentosum – without doubt
2 Appears to me a stunted form of Laurensia obtusa – which is found all over the world
3 Plocamium coccinum – without doubt
4 Is a Rhodospermous Alga bleached. It may possibly be Gracilaria multipartita but it is a not like any of the varieties I have. I see no fruit.
5 Is a species of Jania (next genus to Corallina) it nay be Jania rubens or rather Jania micrarthodes but I have seen no specimens of the latter and have long had the idea that all the specimens of the genus were but one species
6 Perhaps a young state of Chorda lomentaria but I am very uncertain
7 Polysiphonia cladostephus – at first I thought it might be Polys. versicolor but that seems a rare species and your agree well with my specimens or would do so if yours had been neatly spread out
8 May be a species of Gigartina but I rather suspect it is one of the many forms of Hypnea muscoides – It is not in fruit so I only guess"

I feel much obliged to Dr Arnott for his promptitude in answering the notes I have written to him and for the trouble to which he has put himself in examining the plants sent. I hope you will be able to send him some Algae that will please him and that as you have found some mosses in N. Zealand not hitherto got and described so you will also make a number of discussions in regard to Sea Weeds. It is a great matter to have such an eminent Botanist as Professor Arnott to send them to and thro [sic.] him to Dr Harvey the most eminent Algologist in Great Britain.

Between Wilson and Arnott you will soon be (if you are not already) the best Cryptogamic Botanist in New Zealand. I have not yet heard from Mr Wilson. Hoping to hear from you soon.
I remain
Yours very truly
John Ross".

(3) "…Busby 11 June 1860
My Dear Sir

I have now received from Mr Wilson the Mosses and Hepaticae you sent last and give you the numbers and names sent with the remarks made on each. The Hepaticae were 2 in number Nos 3 & 4. The Mosses 13 in number – viz from No 48 to 61. And first of the Hepaticae
3 is Trichocolea lanata (or the Jungermannia lanata of Hooker) – It is a great rarity to get it in fruit only Menzies[10] having previously met with it in that state; so that you have been very fortunate
4 is Symphogyna subsimplex Mitten

-Mosses-
49 Cladomnion laetum Hook. fil & Wils. This moss should be sent in a better state
50. Macromitrium prorepens Hook., var. 2 or a species intermediate between it and Macromitrium

microstomum H & Grev.
51. Macromitrium incurvifolium Hook. & Grev.
52 Rhizogonium subbasilare Schimper
53 Hypnum cyparioides Bridel
54. Hedwigia ciliata (New to New Zealand)
55. Weissia microcarpa Hook. fil. & Wils (New to New Zealand)
56 Conostomum australe Swartz
57 Bartramia affinis Hooker
58 Bartramia papillata Hook. fil. & Wils.
59. Leucodon tomentosus(Cladomnion Hook. Fil. & Wils.) New to New Zealand – this moss should be sent in a better state
60. Fissidens viridulus var. acuminatus
61. Weissia flavipes Hook. fil. & Wils.

You have thus in last parcel of Mosses sent three which were not previously got in New Zealand and one of the Hepaticae in fruit which was never got in that state before but once. Mr Wilson remarks of No. 41 Neckera laevigata "…There does indeed seem to be two forms of this species one with wide spreading branches unlike what had been previously gathered.

Of No. 32. Hookeria microcarpa Mr Wilson says "…along with this is sent the Hookeria quadrifarium wehich is very different in the larger cellules of the leaf"

I will try to compare the loose Mosses sent with those named and if I find any I cannot identify I will send them to Mr Wilson for his inspection.

Hoping this will find you in good health and with as much botanical ardor as ever and expecting a new supply of Mosses Ferns and Algae soon.
I remain
Yours very truly
John Ross…"

(4) "…Busby 4 October 1860
My Dear Sir

I sent the Mosses which I received in your last letter to Mr Wilson along with one or two single specimens which you previously sent and also some Mosses from Malta, Corfu, and How in Upper Egypt brought by Mr Brown (who leaves today for Australia on his way to New Zealand and who conveys from me an introductory letter to you) and have a few days ago received a reply.

Mr Wilson desires me to thank you for your kind attention to his wishes.

The enclosed specimen marked Otago B is the only one I have but I must send it as you did not number it and therefore will not know it otherwise. It is a new species. Mr Wilson calls it Isothecium succulentum and wishes very much to have some specimens of it and if possible gathered in a better state. I will be obliged by your returning it after you have got a duplicate.

Mr Wilson says that the Macromitrium strictum sent was gathered out of season and that better specimens are very desirable.

The third specimen Mr Wilson calls Hypnum bipenne and thinks is probably an undescribed species hitherto confounded with Hypnum tamarscinum. He cannot examine the specimens satisfactorily being unripe – better specimen he says are very desirable.

The fourth specimen enclosed which you sent me a number of years ago without a number so that you probably have no duplicate he says is a flowering plant out of flower and that it seems to be allied to the Saxifrage family. It is somewhat like a Moss but you may fall in with it in flower when it will be more easily made out.

Hoping to hear from you soon and that you will find leisure for botanising during so much disturbance in the Colony.

I remain
Yours very truly
John Ross…"

(5) "…Busby 18 January 1861
My Dear Sir

I am longer in writing you than I intended having found some difficulty in getting the names of the Ferns you sent. Indeed I have not yet got names for them all but will send them as soon as I c an

I intend buying Lowe's Book of British and Exotic Ferns[11] which costs between five & six pounds and also Miller's Synopsis Muscorum[12] which costs about two pounds (there is a better book

on Mosses viz. Bruch & Schimper's Bryologia Europaea[13] but it costs twenty three pounds!). I will then be able to give you the characters of each species.

I intend seeing Mr Keddie next week about the fossil ferns and Hymenophyllums and will send you the result. He is coming out to give an address at our Penny Bank Soiree.

N. is the Polystichum coriaceum
O. is the Doodia caudata
P. is the Todea hymenophylloides
Q. is the Litrobrochia vespertilionis
R. is not yet named
S. is the Cheilanthus tenuifolia
T. is a Hymenophyllum but I cannot yet tell you its specific name
U. is the Hymenophyllum dilatatum

I have been kept very Busy for a month or two past with professional business, Penny Bank business etc etc, else I might have got further on in getting the ferns named. I will endeavour to have all right by next mail.

I sent an introductory letter to you with Mr Brown who was Chemist at the Busby works but who was under the necessity of going to a warmer climate in consequence of being affected with a cough and spitting of blood. Please let me know in your next whether you have seen him. I should have had a letter from him about this time.

I have just received your two letters of Mosses. Hoping to hear from you soon.

I remain
Yours very truly
John Ross…"

(6) "…Busby 12 February 1861
My Dear Sir

After I wrote to you last I sent the ferns you sent and also the drawings of fossil ferns to Professor Arnott and after about a week got them returned, with the following remarks which I transcribe.

"N. Polystichum (or Aspidium s usually called) coriaceum Presl.
O. Lomaria lanceolata Br.
P. Davallia Novaezealandiae Col. This I only make out by description not having a specimen in my Herbarium
Q. Pteris (Leptobrachia) vespertilionis LaB. Probably – but the specimen is very imperfect and young. It is a large plant
R. Polypodium rugulosum LaBill. So I suppose but the specimen is so much smaller than any I have that I only infer it is so by there having no other species from New Zealand agrees so well
S. Is a species of Hypolepis not H. tenuifolia however but as far as can be judged by description it is H. millefolia Hook. When a form (or any plant) grows usually to the height of 16 or 18 inches, it deceives one much if a baby be selected which I suspect is the case with your correspondent
T. Hymenophyllum mutifidum Sw. var.
U. Hymenophyllum dilatatum Sw.
V. Hymenophyllum demissum Sw.
W. Gleichenia Cunninghami Hook.
X. Hymenophyllum pulcherrimum Col.
Y. Hymenophyllum polyanthus Sw.
Z. Hymenophyllum multifidum in appearance but if so the fruit is imperfect and more like a poor specimen of H. multifidum
8. Hymenophyllum pilcherrimum Hook. a very different variety from X
9. Hymenophyllum demissum Sw.
10. Ditto
11. Hymenophyllum demissum Sw. var.
12. Hymenophyllum demissum Sw. var. these two look very different but appear to me the same species it is very variable
13. H. demissum var. This seems the same state of the plant ads No. 11
14. Hymenophyllum bivalvum
15. Hymenophyllum rarum Br.

I have only kept those of which I have no specimens whatever in my Herbarium – or of which at least I have none from New Zealand presenting the same appearance of the specimen sent by Mr Buchanan. It is much to be regretted that he does not send to this country larger specimens when

they can easily be got and at least half a dozen of each. A single specimen frequently gives no idea of the species whereas a suite of specimens enables one to speak more confidently for what may be imperfectly marked in one may be developed in another. It is quite unnecessary for him to attach the specimens to little bits of white paper. If kept as a collection they must be all transferred to sheets 17 inches long at least. When sent home each species (several specimens of each all loose) may be sent within a double sheet of drying paper or ordinary thin paper like for parcels – say 16 inches long & 10 broad each page. A pasteboard below and above the packet protects them from injury and in that way they may be sent as a parcel all over the world.

The fossil ferns I do not pretend to name"

If the above parcel be kept open at the ends and have only the particular number to each species without other writing it comes under the regulations of the Book Post and if under 4 ounces in weight can be sent here for fourpence. I will write about the Mosses in my next.

Yours very truly
John Ross…"

(7) "…Busby 18 March 1861
My Dear Sir

I have been anxiously expecting some communication from Mr Wilson of Paddington for a week or two past but it has not yet come to hand. I think however it must come soon unless he is laid up from bad health. I will lose no time in writing you after his parcel comes to hand.

I have had no notice of the arrival of Mr Craig in the Country and have not yet seen his Father. I however saw Mr Arnold the Mason from Eaglesham[14] who is well acquainted with his Father and requested him to give Mr Craig's Father the information you sent first time he saw him.

In one of your letters you speak of your inability to discover the fructification of Algae. I am not able to help you much in this. Sir William Hooker says "…the seeds or sporules consist of minute granules, internal, clustered or scattered or embedded in tubercles or peculiar processes arising from the frond. Often two or three different kinds or rather forms of fructification exist in the same species but each apparently in itself capable of becoming a new plant. There is nothing that can be compared to the stamens in phanerogamous plants."

The villagers were very much shocked that Mr James Crum[15] had committed suicide. He proposed taking down the New Mill and building another in its site to cost Forty Thousand Pounds but some difficulties real or imaginary having come in the way he paid off all the men employed in digging the foundations discharged some of his oldest servants and then took his own life.

Hoping this will find you well and that I will hear from you soon.

I remain
My Dear Sir
Very truly yours
John Ross…"

(8) "…Busby 22 March 1861
My Dear Sir

I have just had a communication from Mr Wilson which I think it will be the best way to send you a copy of
"Paddington Nr Warrington
20 March 1861

My Dear Sir

I duly received both of your letters with their enclosures for which I thank you most sincerely and I feel exceedingly obliged to Mr Buchanan for the perfect specimens of <u>Hymenodon pilifer</u> H. f & W. They quite confirm the view I entertained of the Moss when I had none but imperfect specimens much overripe.

Several of the 21 specimens last sent, prove to be new additions to the previous list – of those marked with a double asterisk I should be glad to have more in good state. The male plant of No. 72 and fruited specimens of 82 and 80 are very desirable – also more of No. 65.

I return the specimens of *Fissidens* they were much intermixed and required to be detached from the papers on which they were fastened.
Believe me
Most truly yours
W. Wilson

/ 66 Pottia limbata Wils MSS (new species) unripe
69 Dicranum setosum Hook. fil. & Wils. FL. N. Zel.
/ 65 Campylopus attenuatus Wils. MSS (new species)
68 Campylopus intreoflexus (tall state)
* 64 Trichostomum papillatum W. MSS (new species)
* 80 Distichum aciphyllum W. MSS (new species, barren with Campylopus flexuosus var. barren
67 Grimmia apocarpa var.
74 Leptostomum gracile R.Br.
71 Bryum blandum H.f. & Wils.
62 Bartramia radicalis P. Beauv.
Fissidens bryoides var.
F. viridulus var. acuminatus
F. tenellus H.f. & Wils.
73 [72] F. adiantoides var.? (male fl. or male fruit absent)
75 Calomnion laetum H.f. & W.
76 Neckera laevigata H.f. & W. & Leptodon Smithii
* 82 Trachyloma planifolium (Neckeera) Hooker
77 Hypnum collatum H.f. & Wils. (possibly a state of H. serrulatum Hedw.)
79 H. collatum (larger state)
78 Isothecium pulvinatum H.f. & W. (with I. arbuscula male plant)
** 72 Hypnum ambroseum W. MSS (new species)
70 H. cupressiforme var.
81 H. politum H. f. & W.
63 Hookeria amblyophylla H. f. & Wils."

I enclose the species of *Fissidens* as sent by Mr Wilson. Hoping that you will be able to supply Mr Wilson with the Mosses he wants and that your great success in discovering new species will continue.

I remain
Yours very truly
John Ross…"

(9) "…Busby 17 July 1861
My Dear Sir

Your parcel sent by Mr Craig came to hand about a week ago. It having been received by Mr Craig's father along with his effects. It would appear that (as you anticipated) he died on his passage home when near Calcutta. Accept of my best thanks for the parcel containing such interesting specimens. I will write you whenever I get the names from Professor Arnott and hope that you may be able to turn the tree prevailing so much on your land to good account.

I hope you will be able soon to send Professor Arnott some of what he calls dirty sea weeds as he is I understand busily employed at present in examining the diatoms to be got from them. I have little news of any kind to send you from Busby. The Printworks are rather slack here as throughout the whole country principally from the disturbed state of America. Mr James Hall the Manager leaves Busby next month having thrown up his situation.

I have also to inform you that the late rifle contest at Wimbledon near London for the Queen's Cup Mr William Moody from Busby stood higher than any other rifleman from Scotland having made sixteen points and the Winner eighteen.

Hoping to hear from you soon and to write to you soon.

I remain
My Dear Sir
Yous very truly
John Ross…"

On the 6 August 1861, John Ross wrote to Prof. Walker Arnott:

"…Accept of my best thanks for your kind letter and valuable information. I mentioned to Mr Buchanan what you said previously about the necessity of sending a number of specimens of each kind of plant and the facility with which they could be sent by means of the book post but the parcel which brought the present ferns etc left New Zealand before he received that letter. I hope therefore that in future the specimens of each fern etc sent will be more numerous and in a better state. I will take care to convey to him again your remarks for his guidance in future. I had no idea of your returning the specimens I sent. I was only sorry they were so few. Yours very respectfully. John Ross" (W.A. Arnott Correspondence, BM)

Notes

1 William Wilson (1799-1871). British bryologist noted for his book *Bryologica Britannica: containing the mosses of Great Britain and Ireland* (1855). He collaborated with Joseph Hooker in preparing the chapters on mosses for both parts of *Flora Antarctica*. Hooker generously marked this assistance thus "…I here most gratefully acknowledge the invaluable assistance afforded me in the more complete determination, and in the diagnoses and descriptions, of the mosses, by our old and valued friend William Wilson, Esq, of Warrington; whose accuracy in botanical, and especially in microscopical investigation, and knowledge of this tribe of plants, are beyond praise" (Hooker 1844: 117). See also Lawley (2008a, 2008b).

2 George Arnott Walker Arnott (1799-1868). Scottish botanist who was Regius Professor of Botany at Glasgow University from 1845 to 1868. Toward the end of his life he became much interested in diatoms.

3 The John Ross letters to John Buchanan are part of a bound volume of correspondence that was deposited in the Mitchell Library, Sydney, by Buchanan's brother Peter who, as residuary legatee was left JB's property and effects on his death. The letters were obviously a source of great interest, and at times solace, to Buchanan who held onto them together with his books right to the end. The Mitchell Library Catalogue entry reads: *Buchanan, John [c1866-1888] Correspondence letters containing botanical notes from various persons in New Zealand. Issue Microfilm at CY POS 105 Dup Negs also held ZA 644 Microfilm at CY 107.* The microfilm has the following introductory note "…The volume contains mainly inwards correspondence from people such as Ferdinand von Mueller, T. Kirk, Alex. Mackay, John Munro, John Ross, E.H. Featon and F. Buchanan, and others who were interested in botany either professionally or otherwise. The letters often accompanied specimens and they describe where and under what conditions the specimens were found. Other letters refer to zoology and geology. There are some letters by Buchanan himself on botanical matters". Photocopies of this correspondence are in the Alexander Turnbull Library (Adams 1990b, 2000), and I purchased a copy of the microfilm from the Mitchell Library several years ago. Additional correspondents found in the volume are: Joseph Hooker (Kew), Andrew Burns (Nova Scotia), William Purdie (Dunedin), William Wilson (UK). George Wilson (Gisborne), Peter Buchanan (JB's brother and residuary legatee), George Ross, William Skey, Agnes Small (JB's sister), T.W.N. Beckett (Christchurch), James Park, James Hector and James Stirton (Glasgow). The letters to John Buchanan from James Stirton were published recently (Galloway 2012).

4 Roger Hennedy (1809-1876). Professor of Botany at the Andersonian University in Glasgow (now Strathclyde University) from 1863-1876. Lectured in Botany at the Mechanics' Institute from 1849, where he very likely taught John Buchanan and his pattern designer colleagues, at his botanical evening classes which were very popular and well-attended (Simpson 1878; Curtis 2009). He was also the teacher of the Christchurch bootmaker/botanist Robert Brown *tertius* (see M.J.A. Simpson: http://www.TeAra.govt.nz/en/biographies/2b42/1

5 William Gourlie (1815-1856). Scottish merchant (calico printer) and botanist. Partner in William Gourlie & Sons, 8 South Frederick Street, Glasgow. He collected mosses, shells and fossil plants. He was active in the Glasgow Philosophical Society; local secretary in Glasgow for the Botanical Society of Edinburgh, and local secretary for the 1855 Glasgow meeting of the British Association for the Advancement of Science.

6 William Keddie FRSE (1809-1877). Editor, scientist, collector and author. Sub-Editor then Editor of the *Glasgow Scottish Guardian* newspaper for 23 years. Lecturer then Professor of Natural Science in the Free Church College in Glasgow. A founder member of the Council of the Glasgow Archaeological Association (Mearns 2008), he was also Secretary of the Glasgow Philosophical Society and Editor of its Transactions. He was elected FRSE in 1867.

7 Glasgow Philosophical Society, a learned society founded in 1802 "for the improvement of Arts and Sciences" in the city of Glasgow. It was made a Royal Society in 1901.

8 *Flora Antarctica*, the first part of The Botany of the Antarctic Voyage, published in two volumes (Hooker 1844-1847).

9 William Henry Harvey FRS (1811-1866). Irish algologist, and friend of R.K. Greville, G.A. Walker Arnott, and especially of Sir William Jackson Hooker (Ducker 1988).
10 Archibald Menzies FLS (1754-1842). Scottish botanist, explorer and surgeon. Visited New Zealand (Dusky Sound) in 1791 as Vancouver's botanist on the *Discovery* (Galloway & Groves 1987; Galloway 199; McCarthy 2008).
11 Edward Joseph Lowe FRS (1825-1900). English botanist and meteorologist whose book *Ferns: British and Exotic*, consists of 8 illustrated volumes published in London by Groombridge & Sons between 1856 and 1860.
12 *Bryologia Europaea seu genera muscorum euopaeorum monographice illustrata,* authored by Wilhelm Philipp Schimper (1803-1867), Philipp Bruch (1781-1847) and Wilhelm Theodor Gümbel (1812-1858) and published by E. Schweizerbart in Stuttgart between 1836 and 1856 in 65 quarto fascicles, brought together in 6 volumes comprising 1365 pages of text and 640 plates (Lamy & Robin 2003).
13 *Synopsis muscorum frondosorum omnium hucusque cognitorum,* by Karl Müller (1816-1899), published in 2 vols (1849 and 1851) by A. Foerstner, Berlin.
14 Eaglesham is a village and parish in East Renfrewshire, 10 miles south of Glasgow and south of Busby.
15 James Crum, member of a prominent and philanthropic family who established and ran the Thornliebank printworks.

To be continued.

PUBLICATIONS

- **Publications Received**

Auckland Botanical Society Journal Vol 67 (1) Fieldtrip reports including Torbay reserves, Tuhua, Awhitu, articles including Kermadec expedition, ligules of Auckland grasses and 21st Fungal Foray.

Rotorua Botanical Society Newsletter No 58 June 2012 James Irwin obituary, fieldtrip reports including Whenuakura Plains, Paeroa Water Reserve, Pokopoko reserve and Little Waihi Islands.

Wellington Botanical Society Newsletter June 2012 ISSN 1171-9982 Fieldtrips and meetings, events, awards available, submissions made, reports, trip reports including Taranaki and Western Wairarapa.

Canterbury Botanical Society Newsletter July 2012:7 Fieldtrips, AGM report, subscriptions. New website: http://www.canterburybotanicalsociety.org.nz

Canterbury Botanical Society Newsletter July 2012:8 Upcoming meetings and trips, meeting report – QEII covenant management, trip report – University of Canterbury grounds.

Botanical Society of Otago Newsletter July 2012:66 Upcoming meetings and fieldtrips, articles including alpine *Anogramma leptophylla*, trip reports including Craigieburn Reserve, Quarantine Island.