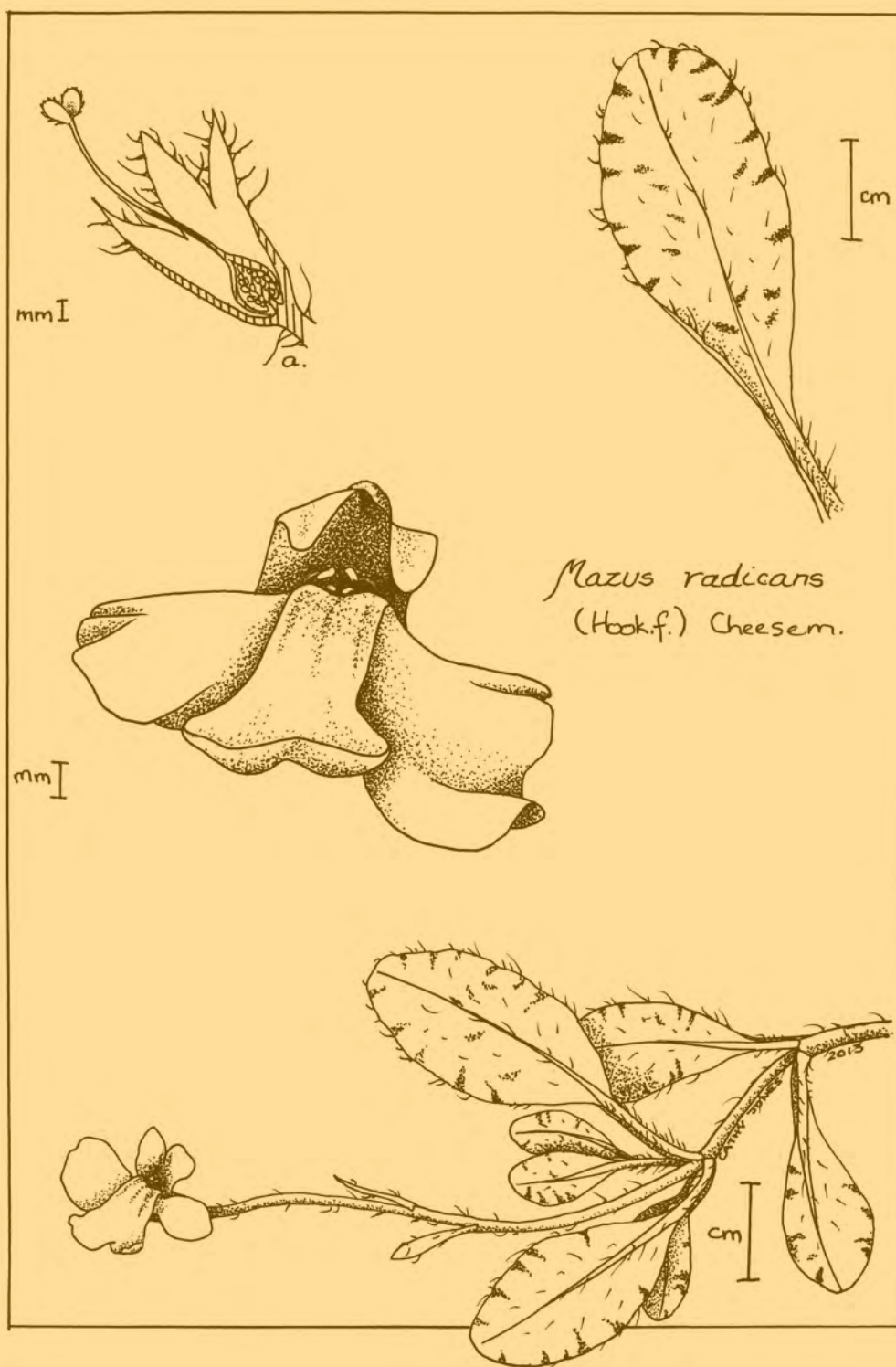


NEW ZEALAND BOTANICAL SOCIETY

NEWSLETTER

NUMBER 114

December 2013



New Zealand Botanical Society

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Subscriptions

The 2013 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 March 2014 issue is 25 February 2014.

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

Mazus radicans, drawn by Cathy Jones from a cultivated plant on 1 December 2013. a.cross section of calyx containing immature capsule.

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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 2014:

- President
- Secretary/Treasurer
- 3 Committee Members

Nominations for all positions opened 1 December 2013 and close on 19 February 2014. 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 March *Newsletter*.

Regional Botanical Society News

■ Auckland Botanical Society

September Meeting

For the plant of the month Neil Davies discussed the native convolvulus, *Ipomoea cairica*, with the southernmost natural population occurring on Tiri Tiri Matangi. Ewen Cameron, who has a special interest in the botany of the Hauraki Gulf islands, spoke on the vascular plants that survive the rigours of life on the edge – the edge of the sea, that is. Some tropical examples were shown first, then the species that inhabit the rocky and sandy shores of our mainland coast and that of the local islands.

September Field Trip

"Seaforth", is a 60ha property near Hatfields Beach that has been owned by the Mackenzie family for 83 years. It was planted in pines in the early years, but they have not thrived on the impoverished soils, and gumland scrub grows under them, with bush remnants in the gullies. The second Bot Soc visit in 23 years was timed to coincide with peak flowering. Kumarahou (*Pomaderris kumeraho*), clematis (*C. paniculata*), *Pimelea longifolia*, *Alseuosmia macrophylla*, *Mida salicifolia* and mairehau (*Leionema nudum*) were all blooming beautifully. The one large hard beech (*Nothofagus truncata*) on the property was visited, and an interesting find was a field of the sundew, *Drosera hookeri*, which seems to be moving southwards.

October Meeting

Teresa Lebel, the inaugural Ross Beever Fellow, is on a two year sabbatical from the Royal Botanic Gardens in Melbourne. Teresa, a mycologist, described two of her current projects, firstly the diversity of the truffles of New Zealand, then she talked about the various interactions between fungi and plants, insects, mammals, birds and lizards. She ended with a plea for members to look for galls growing on glasswort (*Sarcocornia quinqueflora*), as there is an insect/fungus partnership involved.

October Camp

The weather was kind for all but the last morning of our camp at Ahipara. The trip started with a walk along the dunes, guided by interested locals. Garden escapes and dumpings have turned this area into an exotic garden. Local botanists Kevin Matthews and Bill Campbell led us unerringly to the plant treasures of the Ahipara Plateau gumfields. *Phylloglossum drummondii* was the undoubted star of the trip, but we were lucky enough to see *Lycopodiella serpentina* and a late flowering *Thelymitra malvina*, with mauve cilia, and some of us drove along the 4WD road and saw a good population of *Korthalsella salicornioides* parasitising the manuka. The next day was spent in the environs of Lake Ohia, and again local knowledge allowed us to view rarities such as *Plumatechilos tasmanica*, *Linguella puberula* and an early flowering bearded *Calochilus herbaceus*. Lake Waiporohita is home to vagrant Australians, *Gratiola pedunculata* and *Juncus polyanthemus*, and we then drove to Coopers Beach to see Bill's pet population of *Todea barbara*. Highlights of a day spent on a track in Herekino Forest were northern friends, *Ackama rosifolia*, *Halocarpus kirkii*, *Petalochilus bartlettii* and masses of the minute filmy fern, *Hymenophyllum armstrongii*.

October Field Trip

John and Gale Matheson, who farm at Hakaru, near Mangawhai, have joined the growing number of farmers who are fencing their bush blocks and undertaking pest control. The most notable

species on the farm is a population of c. 16 trees of *Halocarpus kirkii*. A bewildering array of leaf forms of *Alseuosmia* finally fell into place as two distinct entities – a form with largish, shiny dark leaves with red petioles that fits comfortably into one form of *A. quercifolia*, and the rest were good *A. banksii*. The farm is c. 10km north of Logues Bush, where this latter species also grows. As it was orchid season, a dozen orchids were added to the species list, several of them in flower.

November Meeting – the Lucy Cranwell Lecture

Jennifer Bannister, Research Associate from the Botany Department, University of Otago, was our lecturer for 2013. "Botanising in the Miocene" led us on a fascinating tour of a maar lake deposit in Central Otago. Jennifer prepares the cuticles and other leaf features to attempt to identify fossil leaves from the laminated diatomite.

November Field Trip

That paragon of Waitakere botanising, Sandra Jones, led the walk from Te Ahuahu to Karekare. As promised, the cliff views were spectacular, and special plants were found around every corner. *Thelymitra longifolia* was present, but was outshone by the abundant, entomophilous *T. aff. longifolia*, with flowers wide open in the sun. *Scandia rosifolia*, *Celmisia major* and the endemic *Myosotis pansa* were other flowering treats, and Sandra's pet plant of *Botrychium australe* showed one sterile frond.

Forthcoming Activities

11-17 January 2014	South Island camp, Tautuku Outdoor Education Centre, Catlins
15 February	Saddle Island, Mahurangi
5 March	Lucy Cranwell recipient, Corin Gardner: <i>Utricularia</i>

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■ **Rotorua Botanical Society**

October 4-6 Weekend Trip: East Cape #7

On Friday we met with 12 Friends of the Domain at Hukutaia Domain. The reserve was originally set aside to protect a very large puriri of local Maori significance and its surrounding forest. The area has had a long history of plantings of species from other areas but, over the years, weeds, natural regeneration or the spread of more vigorous additions has overtopped many specimens. As a result many of the labels no longer clearly related to particular specimens. Our aim was to identify plants and their associated labels. We found that few of the special plantings remain.

On Saturday we headed to a patch of bush near the Motu Bridge. The typical puriri and kohekohe coastal forest was mainly on a flat at the bottom of a slope. Over much of the area the coastal forest shared dominance with tall old kanuka. Patches of wetland were dominated by young kahikatea, which tended to pure kanuka near the bridge. A recent slip also produced several introduced species of interest amongst the pampas and gahnia. The up river riverbank revealed *Jovellana sinclairii*.

On Sunday we went to a young tanekaha stand within pine plantation at Houpotu Rd (near Motu). Key finds were *Pterostylis montana* and *Pimelea tomentosa*, but the stand was mostly dense tanekaha. We climbed to the ridge picking up the odd interesting species including *Corybas cheesemanii*. We then headed to a large wetland with dense *Carex geminata* and *C. secta* especially on the northern side, with a fringe of *Baumea tenax* and *B. rubiginosa*. The highlight was *Sparganium subglobosum*.

Young Wetlands and Waitangi Soda Springs Mire Orchid Trip

A small group met at Young Wetlands adjoining Tumurau Wetland and Tarawera River on Rangitaiki Plains at Braemar to search for rare orchids in flower, such as *Pterostylis paludosa* or *P. micromega*. These species have been seen in similar grey willow (*Salix cinerea*) dominated wetlands in BoP in recent years. There was little of interest around the edge of the open water until we got further into the intact grey willow forest. Here were *Carex secta*, *Coprosma tenuicaulis* and scattered *Cyclosorus interruptus*. Unfortunately occasional plants of royal fern (*Osmunda regalis*) were seen and removed, along with a kiwifruit (*Actinidia deliciosa*) vine. None of the target orchid species were noted, with the only orchid of note *Drymoanthus adversus* growing on Chinese privet (*Ligustrum sinense*).

A quick stop at Waitangi Soda Springs mire enabled a trip into the wetland. Pushing through dense *Machaerina rubiginosa* and *Carex secta* with scattered manuka (*Leptospermum scoparium*) and

Coprosma propinqua made for slow going and little suitable orchid habitat was presented and none seen. Of note were three plants of *Ileostylus micranthus* growing on *Coprosma propinqua*.

FUTURE EVENTS

2 February

Umurua Scenic Reserve and Lake Rotohokahoka, Mamaku Plateau

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Secretary: Elizabeth Miller (07) 343 5013

rotoruasbotanicalsociety@gmail.com

Web Page: www.wildland.co.nz/botanical.htm

■ Taranaki Botany Group

September 15: Mimi Scientific Reserve and Mimi Estuary Key Native Ecosystem

The Mimi Scientific Reserve was our first stop, with the aim being to find the 'range restricted' herb *Brachyglottis turneri*. It was easily spotted high on the papa cliff above the road, its distinctive heart shaped leaves obvious below the drooping leaves of the *Machaerina sinclairii* that was growing near the cliff top. Some plants were also seen lower down, again sheltered below other vegetation. While none were accessible for closer study we were pleased to have seen them. It was too early for the yellow flowers but mental notes were made to drive this route in November.

The Mimi Estuary KNE is located on crown and private land approximately 5.5km north east of Urenui in North Taranaki. It is made up of the Mimi riverine estuary, estuary margins and the main foreshore of sandy, driftwood areas to the immediate north and south of the river mouth. These areas contain a variety of rare habitat types. Notable 'Regionally Distinctive' species we saw while exploring the southern edges of the estuary included saltmarsh ribbonwood (*Plagianthus divaricatus*) many plants heavily in flower and coastal tree daisy (*Olearia solandri*) some of which appeared to be very old trees. Around the margins were a range of plants well suited to brackish and salt water including *Apium prostratum*, *Apodasmia similis* and *Selleira radicans*. The beach was also visited, with a sighting of royal spoonbills. Over the last 17 years much planting has been done in the paddocks running down to the estuary by the private owners; this appears to be thriving. After our botanising they also opened their gallery for us and were happy for us to eat lunch at their picnic table.

October 13: Te Henui Walkway

Eleven keen native plant enthusiasts had an excellent morning under the guidance of local orchid expert John Dodunski exploring the upper reaches of the Te Henui Walkway in New Plymouth. Local Forest and Bird members have been very active in trying to control weeds by the Walkway. Unfortunately it is a huge challenge as plant material has often escaped from or been discarded by neighbouring gardens.

Stuart Collins kindly pointed out *Mida salicifolia* and *Pittosporum cornifolium* within easy reach of the track. One curious feature is the occasional interloper epiphyte on some trees, including bromeliads and Australian *Dendrobium*. Perhaps these may upset the native purist, but surely they are less intrusive than the exotic weeds and there is no suggestion at this stage of them naturalising. Inland of Cumberland Street John showed us clay banks with an interesting range of ground orchids, including several *Thelymitra* species and *Orthoceras novae-zelandiae*. He has had some success working with maintenance staff in trying to preserve the heathland type habitat by judicious spraying, weed eating etc. By the more shady banks he explained the distinctive features of six different *Nematoceras* orchids, and flowering *Drosera auriculata*. New Plymouth is fortunate to have people like John who have spent so much time observing local plants, and in having an impressive range of walkways and various native plant habitats within the city boundary.

November 17: Tom and Don's Bush

Tom and Don's Bush is a 15 hectare reserve, one of the few remnants of mature lowland forest in Taranaki. Located between Mt Taranaki and the sea, 2.6 km east of Okato, it has been protected under a QEII covenant since 1991. In 1992 it was gifted to the Forest and Bird Society, with the request that it be known as "Tom and Don's Bush", and in 2006 it came under the guardianship of the North Taranaki Branch. The 15-25 metre high canopy of tawa (*Beilschmiedia tawa*), pukatea (*Laurelia novae zelandiae*), kohekohe (*Dysoxylum spectabile*), with occasional rewarewa (*Knightia excelsa*) and rimu (*Dacrydium cupressum*), and sparse sub-canopy of mainly mahoe (*Melicytus ramiflorus*) and tree ferns, towers over kawakawa (*Piper excelsum*), thickets of knee-high pukatea and kohekohe seedlings and smaller, slow-growing young nikau (*Rhopalostylis sapida*). Investigation of an area showing little regeneration suggested that the mat of tough tawa roots could be hindering the process

of germination and early growth. The lower tier also contains numerous epiphytic and terrestrial ferns, including several filmy fern (*Hymenophyllum*) species, one being *H. flexuosum*, and it was pleasing to see *Pterostylis banksii* flowering and other orchid species present. A large, out-of-season tiered, gilled fungus was identified later as *Agrocybe parasitica*.

FUTURE EVENTS

We would be delighted to welcome any visiting botanists, so please get in touch if you want to join us.

- 19 January Omoana Bush (NZ Native Forests Restoration Trust). 333 acres of protected forest, 35km east of Eltham, towards the Matemateonga Ranges; a head catchment of the Patea River. <http://www.nznfrt.org.nz/reserve/omoana-bush>
- 16 February Moumahaki Lakes & Catchment (Mt Hiwi Key Native Ecosystem) – another attempt. Near Waverley so this will be an early start. The access down to the lake is very steep, and getting in is weather dependent.
- 16 March Dactylanthus in Egmont National Park. Exact location TBC closer to the time. This is likely to be the last year DOC finds and cages these plants, as they are hoping to meet their target of 1,000. Those who are able to will help hunt and cage; but just looking will be fine too.

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Janica Amore 06 7520830. Email: waiongona@clear.co.nz

■ Nelson Botanical Society

August Field Trip: Boulderbank Walk

Eight members boated from Wakefield Quay across to the lighthouse and one met later on the Boulderbank. Around the lighthouse we saw mostly exotic plants including jonquils, freesias, *Sedum album*, asphodel and *Oxalis pes-caprae*. On the 'native' score sheet were *Suaeda novaezelandiae*, *Cotula coronopifolia*, *Juncus kraussii* var. *australiensis*, *Muehlenbeckia complexa*, *Plagianthus divaricatus*, *Metrosideros excelsa*, *Melicytus* 'Waipapa', *Dichondra repens*, *Disphyma australe*, *Thelymitra longifolia*, *Tetragonia implexicoma* and *Myoporum laetum*. Wetter areas and the estuary-side hosted *Sarcocornia quinqueflora*. In addition we encountered grape hyacinth, agapanthus, aloes, agaves, *Carpobrotus edulis*, *Lupinus arboreus*, *Pinus ?radiata*, and *Myoporum insulare*. The afternoon revealed ferns like *Asplenium flabellifolium*, *A. flaccidum*, *Pellaea calidrupium*, *Pyrrosia eleagnifolia* and a localised population of *Cheilanthes sieberi*.

August Evening Meeting: 'Lord Howe Island', Helen Lindsay and Chris Ecroyd

Two members of our society gave an informative talk on Lord Howe Island. Chris went there on holiday and Helen Lindsay went there in 2006 and 2008 as a weeder. Lord Howe Island is 770 km NE of Sydney and is 1455 hectares in a narrow strip with steep mountains up to 875 m. It has a mild, but windy climate and the rocks are volcanic or calcarenite. It has the southernmost coral reef in the world and was uninhabited until discovered in 1788. The population is now about 350 with visitors restricted to 400. Many of the plants were familiar to us although some are different subspecies. Amongst the ferns were *Microsorium pustulatum* subsp. *howense*, *Histiopteris incisa* and *Hymenophyllum howense*. The shrubs include *Macropiper excelsum* subsp. *howense* and *Dodonaea viscosa* subsp. *burmanniana*. There were kohekohe and pohutukawa lookalikes, a kowhai and a close relative of wandering Willie with a blue flower. Among the few large trees on the island were *Syzygium fullaga* with huge buttresses and *Ficus macrophylla* subsp. *columnaris*. There are only 12 orchid species and four palms, including the well-known *Kentia* palm. Lord Howe has huge weed problems with three varieties of asparagus, cherry guava and veldt grass amongst other pest plants.

September Fieldtrip: Peninsula Walk, Lake Rotoiti

Thirteen arrived at Lake Rotoiti on a sunny, but cold morning. Before we entered the bush, *Alepis flavida* was spotted on *Nothofagus solandri* var. *solandri*. One of the features of the Peninsula track was the abundance of hybrids. There were examples within the podocarps (snow, mountain and needle-leaved totara), the beeches, and in *Raukua* and *Gaultheria*. Another noticeable feature was the abundance of trees and shrubs showing different juvenile and adult leaf forms, such as *Raukua simplex* and *Elaeocarpus hookerianus*. On the way, we spotted *Dracophyllum filifolium*, *Carmichaelia australis* and at West Bay, *Discaria toumatou*.

September Evening Meeting: Orchid key workshop, Chris Ecroyd

Thirteen members received instruction in the use of Landcare Research's Orchid Key. This is just one of eight botanical keys that are now available for public use at the Landcare Research website

[www.landcareresearch.co.nz/resources/identification/plants]. Use of the key is much easier if good photographs and notes are taken at the time of finding the orchid. The key is in four parts occupying a single page. A list of "Features Available" allows the user to enter appropriate data relating to the orchid being considered. As the data are entered the possible identification is narrowed down to the most likely species. In theory, if all the features available are fully and correctly identified just one orchid will remain in the "Entities Remaining" list. However, it is usually better to check through the information on each species when there are still a few remaining. The key includes photographs, definitions of botanical terms and links to other plant sites.

October Field Trip: Wairoa bush remnant weedbusting

Our adopted Wairoa Valley bush remnant was the subject of our yearly attentions again this month with a trip by eight Botsoc weed-warriors. The main weedy offenders were old man's beard and blackberry. Openings created by last year's barberry removal are quickly being filled with native saplings, resulting in a wholly native and healthy looking forest. This was our sixth weeding visit and many were amazed at the difference our control had made. The *Teucrium* were thriving, as were the forest margin *Coprosma obconica* and *Brachyglottis sciadophila* that would otherwise have been consigned to oblivion. We worked through the forest interior, mopping up old man's beard and re-acquainting ourselves with infrequently encountered species such as *C. rubra* and black maire saplings. Our efforts are transforming this little remnant into a forest that will be viable long-term.

FUTURE EVENTS

December 15 Herring Stream Rd, Upchurch QE II, Motueka Valley: Kay Jackson 03 5477264
January 19 Beeby's Knob Alpines, Richmond Forest Park: Uta Purcell 03 545 0280
January 31-February 3, 2014. Waima Valley Camp, South Marlborough: Cathy Jones 03 546 9499
February 16 Staircase Rd, Mt Patriarch, Richmond Forest Park: Cathy Jones 03 546 9499

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■ Canterbury Botanical Society

August Field Trip

First stop: Eyrewell Scientific Reserve – permit required. The kanuka has replaced much of the open grassland at the site in the last 40 years, as identified in Brocherhoff & Eckroyd 1995. Despite being well botanised in the past, we were able to turn up one or two new records, including *Clematis paniculata* at about 400mm. A number of orchids were emerging but not revealing enough of themselves to nail down the species but we were at least able to state that some were *Thelymitra* with some certainty. Also notable were a *Helichrysum lanceolatum*, two *Coprosma intertexta* and a scattering of *Brachyglottis bellidioides* and *Leptostigma setulosum*. We also encountered *Carex raoulii*. There was also a scattered but substantial number of broom seedlings (*Cytisus scoparius*), which are being controlled by the Department of Conservation. While there have been substantial changes in species composition over the past 40 years at this site many of the species that have been lost may be contributable to the increased cover of kanuka and the significant reduction in grassland habitat, i.e. we saw no *Raoulia monroi*.

Second stop: Thongcaster Road. This is a surprisingly diverse thin strip of kanuka on the south side of Thongcaster Road. We saw *Coprosma crassifolia*, *C. rhamnoides* and *C. propinqua*, plenty of *Leptocophylla juniperina* and one *Helichrysum lanceolatum*. Of interest were the very small seedlings of kanuka germinating in the road gravels at the edge of the carriageway. One disappointment was the haphazard approach to weed control; there was one tall broom that had obviously been sprayed but did not look to be dying anytime soon, this was surrounded by three *L. juniperina* plants that looked to be faring considerable worse than the broom from the effects of the herbicide.

Third stop: Dagnum – part of the Ecan Waimakariri River Regional Park. A broad open paddock with the undulations of old river channels throughout, bounded on two sides with pine plantation, greeted us as the last stop on our August field trip. The site is studded by a handful of trees – well a woodland teacher's handful anyway – there was only one kowhai and two kanuka. Progress was slow, as much of it was on hands and knees, but we did manage to cover a good deal of the site. While one of the species that we were unable to find may have been a misidentification (*Coprosma intertexta* from 1995 may have been a *Coprosma* hybrid with *C. acerosa* as one parent) the other was *Leptinella serrulata*, which could very easily be overlooked. Alice Shanks was able to add *Hymenochilus tristis*

(leaf only) to the list. The rabbits and hares had been giving the *C. acerosa* x and *Carmichaelia australis* a hard time and their only chance of reproduction is to grow up through a Matagouri. *Carmichaelia corrugata* and *Raoulia monroi* appeared to be some of the most common native species for this site. There are also some good populations of *Muehlenbeckia ephedroides* and plenty of Matagouri. Trip highlight – *R. monroi* omnipresent and even dominant in places at Dagnum.

September Field Trip - Great Island – aka Rakaia Island

Ignoring a foul weather forecast we set off to explore another of the scattered fragment of the Canterbury Plains, this being Rakaia Island. The western end of the island is administered by Ecan, with the remainder farmed. Following a brief river crossing in our 4WD convoy we emerged onto an area of grassland with a good scattering of Matagouri. We parked up next to a fenced area that encloses a restoration trial of *Olearia adenocarpa* – not to keep it in but to keep out the rabbits and hares. One of the issues with many of the small leaved *Olearia* is the near total failure to recruit. One of the issues for *O. adenocarpa* has been the propensity for rabbits to nibble the existing plants right down to the ground – preventing them from even flowering, let alone setting seed. If the plants do manage to set some seed then they has to germinate at one of the driest times of the year all the while competing with exotic grasses. *Olearia* seed soon loses viability if it does not germinate quickly. In the enclosure there has been some recruitment, indicating that the plants will require intensive management in the form of total competition control to be sustained.

We also botanised the grassland and riverbed and encountered a not surprising but previously overlooked *Muehlenbeckia ephedroides*. On the riverbed there were huge areas of *Raoulia monroi* and *R. australis* was also very common. Another surprise was a single *Asplenium trichomanes*. After lunch we headed off to look through some of the kanuka woodland. We spent a while crashing through the understory, which almost exclusively consisted of blackberry, with the occasional native. One pleasant surprise was a single *Teucrium parvifolium*, also of note was the occasional *Myrsine divaricata* and *Corokia cotoneaster* was just beginning to show a few flowers. There was a bit of debate about the identity of the *Carex* we were encountering, which later keyed out to *C. flagellifera* and a single *C. dipsacea*. On the river bed heading up towards the farmed end of the island *Senecio quadridentatus* was abundant.

October Field Trip

A wet week with a suspect forecast saw 11 participants plus a few family members opt for the relative safety of our reserve venues – Medbury and Culverden Scientific Reserves. This visit mirrored previous visits to dryland and kanuka remnants near Oxford and on Rakaia Island, and reinforced the fact that these sites are ecologically complementary, each supporting many species in common but also having their own individual features.

At Medbury Reserve we first listened to Ronny Groenteman who explained at little about her research into bio-control agents for the exotic *Hypericum perforatum*, and the implications for our native *H. involutum* (currently ranked Declining), both of which occur in dryland remnants. Armed with Colin Meurk's original 1988 species list we then weaved our way through the kanuka woodland and mossy grasslands. Given that kanuka was the only species higher than eye level, our eyes were largely directed downwards towards the ground. A patch of kanuka revealed several species of groundsel including *Senecio quadridentatus*, *S. glomeratus* and a particularly attractive brown-leaved taxon which although keying out moderately well to *S. dunedinensis*, differs markedly from the 'typical' form of the species (ranked Nationally Vulnerable). Nearby the exotic *S. sylvaticus* resembled *S. glomeratus*, but with more finely dissected leaves and a pungent aroma. Further on Danny Kimber (DoC ranger specialising in threatened plants) lead us to a small patch of *Leptinella filiformis* (Nationally Critical), planted under kanuka and just coming into flower (see Canterbury Bot Soc journal 38, 2004, pages 87 – 93). This species' leaves had a most distinctive dimply appearance. Later in the morning we also found *L. pusilla*, a new record for the reserve. The first challenge set was to locate the cryptic groundcover *Muehlenbeckia ephedroides* (Declining), this time the sharp eyes of Geoff Henderson were first to succeed, finding a lone plant atop a dry knoll. Just before lunch DoC botanist Nick Head texted us a message promising a bottle of wine (we naturally presumed each) if we could find *Korthalsella salicornioides* (Naturally Uncommon). Our eyes all looked upwards and within ten minutes Nick was in debt, with a single kanuka tree found hosting several clumps, unfortunately the host tree appeared to be on its last legs and we were unable to find the mistletoe again on any neighbouring kanuka plants. Jason Butt and Melissa Hutchison both spotted small patches of *Hymenochilus tristis* (Declining), just coming into flower. The *Thelymitra* orchids seemed very variable with both floppy broad-leaved specimens and upright narrow-leaved specimens, leading to an unresolved discussion as to whether there were two entities present – a good excuse for a

return visit when they are in flower. Like other dryland sites visited recently there were literally thousands of *Microtis unifolia* orchids all through the moss-fields.

At Culverden Reserve we met with Brian Patrick who had just identified the tiny matagouri leaf-roller moth *Acroclita discariana* (Nationally Vulnerable) living on the matagouri shrubs, previously recorded from only from three other sites. Its larvae form a 'nest' within the plant composed of silk, dead leaves and bark, with several larvae feeding from within this. With the impending prospect of the invertebrate inventory outshining the botanical inventory, members set about compiling a plant species list for the reserve. As it turned out the Bot Soc list was not all that large, with a relatively small number of natives and quite a few exotics being recorded. The highlight for most was a huge patch of *Coprosma intertexta* (Declining), plus numerous outlier plants. Closer inspection of the flowers revealed all to be males, leaving us wondering whether these might all have been derived by suckering from a single original plant. Again we found the brown-leaved form of *Senecio dunedinensis* growing under the kanuka canopy. Participants all expressed our appreciation for Danny Kimber's work with threatened plants and wished him well in his role. We hope to reschedule a visit to Laidmore at a later date.

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NOTES AND REPORTS

■ *Dicksonia fibrosa* – naturalised in the Auckland area

Maureen Young, youngmaureen@xtra.co.nz

Pat Brownsey et al argue that that the herbarium collections of *Dicksonia fibrosa* from Auckland northwards may be from naturalised plants. North of Auckland is my stamping ground, and I am familiar with all the northern populations quoted in the article, plus one more specimen found in the Puhoi Valley within the last month. It has never seemed to me that they were anything but natural occurrences, so I would like to present a differing view.

Firstly, some of the plants obviously have some age to them, and "sculptural" gardens are a relatively modern fashion in the country. Farmers' wives grew roses, dahlias and pansies in their gardens, not tree ferns. I don't know where the spores would have come from.

Secondly, the comment that Cheeseman wouldn't have overlooked such a species right on his doorstep is spoken from the mouth of modern man. When Cheeseman died in 1923 the north was largely roadless. Warkworth was almost completely served by steamer, as road travel was so appalling. Local museums can come up with any number of photos showing horses up to their bellies in mud. There is no way he could have easily accessed the isolated areas of Makarau, Kaipara Hills, Kaipara Flats, Puhoi, Waiwhiu and the Matakana Hills.

To my way of thinking a more likely explanation is that this colder climate plant was more widely spread in the north during the last ice age, and has been slowly moving southwards as the weather has warmed. There are several other species that are retreating from the north, or are stranded at higher altitudes. *Griselinia littoralis* and horopito (*Pseudowintera colorata*) grow on the summit of Tutamoe. *G. littoralis*, *Pseudopanax colensoi* and other colder climate plants are found on the summit of Hauturu (Little Barrier), and black beech (*Fuscospora solandri*) has an anomalous presence on Hauturu also. While hard beech (*F. truncata*) is scattered over Northland, it is slowly retreating, with many large trees dying and few seedlings to replace them. I have seen pokaka (*Elaeocarpus hookerianus*) at four Northland sites – two of them as single trees in Lower Northland, but there is no evidence that they are naturalised.

I suggest that the single tree on the property of Geoff Ray in the Matakana Hills is the most northerly known naturally occurring *D. fibrosa* in New Zealand.

■ Tenth Indigenous New Zealand Vascular Plant Threat Listing Assessment published

Peter de Lange, Chair, New Zealand Indigenous Vascular Plant Threat Listing Panel, Science and Capability Group, Department of Conservation, Private Bag 68908, Newton, Auckland 1145, New Zealand, pdelange@doc.govt.nz.

The May 2012 threat assessment of the New Zealand Indigenous Vascular Plant flora is now published (see de Lange et al. 2013). The list, which covers the entire indigenous vascular plant flora, including 166 informally recognised, 'tag name' entities, is now available at <http://www.doc.govt.nz/publications/science-and-technical/products/series/new-zealand-threat-classification-series/> as a free downloadable PDF.

The listing was undertaken by a panel of experts appointed by the New Zealand Department of Conservation and *New Zealand Botanical Society*. The panel has a wide representation of experts from Crown Research Institutes (NIWA, Landcare Research), museums, universities and the Department of Conservation.

In a departure from previous threat assessments, which have been published through the peer-reviewed scientific periodical '*New Zealand Journal of Botany*', the 2012 listing has been published in a new series established by the Department of Conservation, the '*New Zealand Threat Classification Series*'. These publications are also peer-reviewed. The series was set up to ensure that anyone in New Zealand or the rest of the world could obtain free of charge the threat listings for all of New Zealand's biota. The current plant listing, which is the 10th to be published for the New Zealand flora continues a process pioneered by the late David Given in 1976. Given was arguably the first New Zealander to draw to world attention the plight of our native flora.

Since Given's first listing, eight native plants have now been listed as extinct, including *Logania depressa* that was seemingly simultaneously discovered, and wiped out by missionary botanist William Colenso in the early 1840s. The most recent list addition is the newly described scurvy grass, *Lepidium amissum*, which went extinct in 1917 but was only recognised as a distinct species in 2013.

While the current list of extinct flowering plants involve taxa whose loss happened prior to, or around 1954, it's clear that we are potentially facing a new wave of plant extinctions. These will be extinctions that can no longer be justified using the excuse of historical ignorance. Indeed it may surprise New Zealanders to learn that even such iconic taonga as the kakabeak are still facing imminent extinction despite 32 years of being listed as 'Endangered' or 'Nationally Critical'. Of the two species, one, the eastern North Island *Clianthus maximus* now exists with a national wild population of c.120 individuals, whilst the other, the Northland endemic *C. puniceus* is still only known from one wild plant.

Indeed, since the last listing was prepared in 2008, there has been an increase of 46 taxa in

the category 'Threatened', bringing the total number facing a high risk of extinction to 289 (12% of our known flora). This is an alarming trend which reflects a wide range of threats to our native plants which include not only the familiar 'loss of habitat', 'predation from introduced animals', 'competition from weeds', and 'changing land use practises', but also the spread of plant diseases, including exotic viruses, which are increasingly being found in our indigenous flora. In the case of viruses it is not yet clear whether this is a new trend, or simply that we are seeing part of a process that has been going on for a long time, but which we are only now just beginning to research, and so detect.

However, a big factor in the increase of threatened plants has also been, ironically, better science. It is estimated that 20% of our vascular flora still requires formal description. As those scientists concerned with the naming of our native plants and animals review our biota, many new species are being discovered, or often as not 'rediscovered', and not surprisingly many of these are threatened or extremely uncommon. A prime example is the June 2013 publication in the international journal *PhytoKeys* of a revision of Cook's scurvy grass (*Lepidium oleraceum*), where 10 new species were segregated from Cook's scurvy grass. All of these species are seriously threatened. For New Zealand, this situation is not that unusual, and indeed more threat listings (and possibly a few extinctions) are anticipated when on-going revisions on *Craspedia*, *Cardamine* and *Euphrasia*, two of which are due for completion in 2014. Nevertheless while it increases the proportion of threatened plants in our flora, the process is encouraging in that it shows that the full extent of our indigenous biodiversity is finally beginning to be recognised. This is critical if we, as a nation, are to make sensible decisions about managing our flora and fauna.

Threat listing is a critical pathway toward ensuring we have a better understanding of our countries conservation issues. The listings are used by many different walks of life, such as researchers, students and organisations to determine conservation priorities and establish more effective networks toward preventing further erosion of New Zealand's biodiversity. It is a salutary lesson that with the publication of each plant threat listing there have been corresponding increases in the numbers of people empowered by that process, and who want to help, and who go out there and look. This is to be applauded; particularly as threat listing is only as good as the data that flows in to support it.

Reference

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■ Charles Knight and New Zealand mosses (1852-1875)

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

Charles Knight (1808-1891) arrived in New Zealand in November 1845 from South Australia with Sir George Grey when he took up his position as Governor. In February 1846, Grey appointed Knight as Auditor-General where his knowledge of financial matters and official routine was to prove valuable to Grey and especially to his successor Richard Henry Wynyard (Scholefield 1940; Galloway 1990, 1998). Knight had wide scientific interests but was especially attracted to botany. Although he is most often remembered these days for his work on New Zealand and Australian lichens, his first special interest in New Zealand Botany was in fact with mosses, as a letter that he wrote to Sir George Grey in September 1852, with its attached notes on mosses that he collected and examined, clearly shows:

"...Auckland, September 28th/52

My dear Sir George,

Poor Lynd¹, a few days before his death gave me a number of M.S. Books (which, as he said, were of little value, except for the blank leaves remaining in them) – with his Paris Diploma. He gave me a whole morning for his last interview. I was struck by his kind expressions and manliness of interest. I began to wonder how a man of so much leisure had done so little; had gained no distinction in the field he had chosen for his intellectual labours. But when I examined his M.S. Books I found he had completely wasted his time and abilities in endless attacks on the outposts of almost every field of Natural History; copying the useless nomenclatures and systematic arrangements of men like Swainson², Sowerby³ & Newman⁴ but no where any sign of a deeper insight into the wonderful labours of Cuvier⁵, Owen⁶ or Scleiden⁷ [sic], or an intelligible adoption of their methods of anatomical

and physiological Research. He seemed to have no idea of the essentials of things; and unmindful of the advice he had copied into his M.S.S. "Finish all things quickly; the mind should triumph!" An emulative desire to try my strength, led me to investigate the mosses of New Zealand. I have very imperfect means for doing so, my microscope being imperfect, and useless for dissecting purposes. I send herewith a few tracings of the results, I do not know whether they are worth transmitting to the Hookers at a time when they are preparing under authority a complete descriptive work on the Botany of New Zealand; but if your Excellency is of the opinion they are worth the trouble of transmission to Europe I beg you would do me the honor of transmitting them. The idea occurred to me a few days since; so that I had no time to complete anything more than slight tracings of my drawings. You will observe that I commenced with copies on writing paper. It strikes me that if the Botany of these Islands is of sufficient interest in Europe and to the Government of Great Britain to warrant a large outlay on the subject, it is at least of sufficient interest here to make it most desirable to have in our Museums at Auckland and Wellington a collection of our plants correctly named. Should these sketches prove of any value or interest, one can with better grace request to be furnished with the names of the mosses. I have not myself ventured to give the specific names I have found for them, as we have no complete descriptions here. I am so ill provided with specimens as to be scarcely able to furnish one for each of the sketches.

In looking over a late number of the Annals of Natural History, I was interested in the perusal of a paper on Australian Fishes by Sir John Richardson⁸ in which he speaks in very complimentary terms of the valuable assistance he had received from a collection of drawings made by Depy A. Commissioner Neill, in 1841, at King George's Sounds, particularly on account of the notices it contains of the habits and qualities of the fish. He says the drawings are so characteristic that most of the species are easily recognised, but some novel forms could not be systematically described without specimens. An opportunity however had been lately afforded him by Mr Gray⁹ of inspecting a number of dried skins prepared on the spot by Mr Neill – In Sir John Richardson's notices of the Ichthyology of the Voyage of the Sulphur and of the Antarctic [sic] voyage of the Erebus and Terror, considerable use was made of Mr Neill's drawings.

I also found in the same number of the Annals a description of a new genus and several new species of terrestrial, fluviatile, and marine molluscous animals inhabiting New Zealand, collected by Major Greenwood¹⁰ near Auckland and described by Mr J.E. Gray. Among them is the "Helix Dunniae", named in honor of Mrs Dunn, a relative of Mr Joshua Elder, from whom Mr Gray received the first land shell from New Zealand. I notice another H. Greenwoodii, dedicated to Major Greenwood who enabled him to add the genus Helix and several species of it to the New Zealand Fauna. The new genus is named "Latia" and is allied to the Ancyclus.

The Toad described and figured in your Travels in Australia under the name of Breviceps Gouldii has been raised by the Prince of Cassino into a new family if we may judge from the name the creature has gained under the new registration. It must now be termed the Myobatrachus Gouldii. A learned German doctor of the name of H. Schlegel, Curator of the Royal Zoological Museum at Leyden was engaged in this, the Leyden Museum having been lately enriched by a new Toad discovered at Swan River by Dr Preis¹¹ [sic] and named the M. paradoxus. These animals have been found to have teeth in the intermaxillary which it seems are not present in the S. African Breviceps.

You will smile at these matters, and wonder at my wasting your time in this manner; - of local matters I have not left myself room to write about. Our receipts of Customs for the quarter will be sadly retrenched by the numerous demands on the Treasury for Drawback of Duties; - £600 or more during the quarter. The sudden demand for food in N.S. Wales opened a new market for our merchants; but of course we shall not consume a less quantity of goods on this account. Our farmers are in excellent spirits. Major Greenwood has lately sold 88 acres of his land at £3 per acre for what he gave only £1. Even Dr Sinclair is bitten by the mania for farming and he prattles of sheep and fat oxen. He has purchased a large portion of Dr Geddes land in the Manakau. I am sure you may be proud of our rapid advances! Pray give my respects to Lady Grey.

Believe me

Yours very faithfully

Charles Knight.

Rough Notes on Mosses

- 1) The microscope used in the preparation of the original drawings is of a very inferior description.
- 2) The drawings were made on my first examination of mosses. Owing to the imperfection of the Instrument and my want of knowledge on the subject many points have been overlooked, which I now find are of importance. I shall wait the receipt of one of Smith & Beck's dissecting Microscope before proceeding in these investigations.

3) I observe that the tissue of the leaves of the true Hypnum is prosenchymatous; the length of the cells being many times greater than the width. In the Leskea and Hookeria the cells are hexagonal, thus; [small drawing of five hexagonal cells] The Hypnum with hexagonal cells are almost generically different from the true Hypni. Payer's¹² arrangement which separates so widely the Leskeas from the Hookerias must surely be defective.

Funaria. There are two or three species of Funaria No 21, 99 & 69. The transverse projecting lamellae in No 21 are singular; without a dissecting microscope I am unable to push the investigation further; probably the inner peristome is originally attached to these lamellae.

Bartramia No 65 & 89. Probably a Bartramia. The well defined transverse lamellae or bars of the outer peristome are characteristic.

Trichostomum. The T. perichaetiale of Hooker has not been discovered among the Auckland collections. The Barbula No 64 (a) (seldom with twisted teeth) resembles it. There is another Barbula (Tubular) No 86. As Raoul's catalogue contains no Barbula, is there a mistake about the Trichostomum? Is it Barbula no 64a?

If my memory serves me Endlicher describes the genus Leucodon with short teeth. Leucodon calycinus No 20 has not by any means short teeth. The hood perhaps is not truly mitriform. Are the teeth of the peristome awl shaped?

No 74 Quite different from any other genus found in the northern part of N. Zealand. The teeth are opaque and the divisional line, semi transparent.

Ceratodon. - Two species No 91 & No 64 only one mentioned in Raoul.

No 71. Hookeria; the capillary filaments are not to be mistaken for Veins of a Leaf -

No 76 Possibly a Hypnum. Only one plant found in flower with the peristome nearly destroyed. The remains of the inner peristome are shown in the tracing. It is[...] ? sulcate but the tissue of the leaves is hexagonal.

No 39a & 39 are similar. In 39 the mouth of the sporangium is oblique; the branches pinnate.

No 44 & 77 the common leaves have hexagonal cells.

No 50, 50a, 63a & 75a are probably the same. They are certainly not the same as No 56 which I take to be the true? 92 (a) closely allied to the above but the leaves veinless.

No 45a differs from the H. comosum in the point of the leaves being much shorter.

Charles Knight
Septbr 28th 1852..." (Knight 1852)

Sir George Grey sent a copy of part of Knight's letter to Sir William Jackson Hooker, Director of the Royal Botanic Gardens at Kew [this, plus the Rough Notes is preserved in Director's Correspondence Vol. 74, letter 87, in the Archives at Kew], together with the notes that Knight had made on the mosses, plus the numbered specimens [these are now housed in the herbarium of the Bryophyte Section of the Department of Botany at the Natural History Museum]. To this Hooker replied:

"... Royal Gardens Kew. April 24, 1853.

My Dear Sir George,

I cannot tell your Excellency how much I am obliged to you & Dr Knight for the beautiful packet of Mosses, accompanied by the truly excellent drawings of that gentleman. They come too just in the nick of time, when Dr. Hooker is preparing the Cryptogamic portion of his Flora Novae Zealandiae for the press.

I do not think we have in England (at least I am sure I am not that person thought I have dabbled a good deal in Mosses, who could observe so well with the microscope and draw so well what he sees as Dr. Knight. They are the very perfection of Cryptogamic Botany & the young Colony may well be proud of such a man of Science & such an artist. He will I am sure continue his researches & kindly communicate with me or with Dr. Hooker (for tis one and the same) portions of his discoveries, But I write to him myself, & venture to send him a Book where some of the earliest discovered new Zealand Mosses (those found by Menzies in Vancouver's Voyage) were figured.

The Duke of Newcastle¹³ kindly gives me leave to send a parcel through the Colonial Office and I take the liberty of addressing it to your care. I presume it will reach Auckland before you leave it. If not Dr. Sinclair will open it. To make the parcel more acceptable I enclose a packet of Garden Seeds of various kinds, which I so wish will succeed well in your climate. When you return to England I hope to have the honor of showing you & Lady Grey our Garden: - our Palm House & our new Victoria House & our Museum.

Brown¹⁴ were on a visit with me at the very moment your packet arrived & very much pleased at being remembered by her Ladyship & you. He is wonderfully well for his years: but is about to retire

(in May) from the Presidency of the Linnean Society.

Believe me my dear Sir George,
Your Excellency's faithfully & truly obliged,
W.J. Hooker..." (Hooker 1853).

With such enthusiastic support from the Director of Kew, himself a very distinguished bryologist and the author of several major bryological texts (Hooker 1816, 1818, 1820), Knight wrote again from Auckland and sent Hooker further tracings, having also purchased a good dissecting microscope. With it, his enthusiasm knew no bounds and he began studies also on New Zealand liverworts. His letter to Sir William is full of interest:

"... Auckland November 26, 1853

My Dear Sir William

An unexpected opportunity of enclosing a letter to you offering itself this morning, I made a few tracings of Mosses collected a fortnight since on the Island of Kawhau – if new I trust they will arrive in time for Dr Hooker's interesting work. Having only three or four specimens of the *Physcomitrium* (69b) I made a careful dissection of it; the tympanic covering of the columella was loosely attached to the capsule; there was not a trace of peristome. This was my first dissection with a new achromatic dissecting microscope of Beck and Smith, sent out to me – this admirable instrument has opened a new world to me – I may truly be said to have been working hitherto in the dark. To try my strength with this new aid I made an examination of the pistillidium and antheridia of a *Bryum* found together with the same plant. I send the sketch of the dissection. Being struck with your remarks in the *Musci Exotici* [the book that Sir William Hooker had sent Knight earlier to encourage him] on the peristome of the *Leptostomum macrocarpon*, I made also an examination of the Capsule of that moss (vide tracing). The internal membrane of the *Leptostomum* is cellular, attached firmly to the mouth of the capsule – below the attachment is a fold of the membrane shown by a dark line in the drawing, above the membrane becomes thin, but is not easily dissected off entire. The pseudo-teeth are the irregular torn edges of the membrane. These teeth following the contour of the covering operculum, necessarily bends inwards.

I have just commenced the Hepaticae. I shall have an opportunity of ending you tracings of my work on the return of Sir George Grey from the Islands adjacent to New Caledonia where he is gone with Bishop Selwyn.

You smiled I dare say at my presumption in fancying that the existing arrangements of the Mosses are unsatisfactory. But it seemed to me that at least the genus *Leskea* must sooner or later break down; and now I see in the *Musci Exotici* that you yourself have entertained the same view. When the genus *Omalia* which I find in Endlicher¹⁵ is a Leskean genus, and therefore should have no intermediate ciliola, has not only these appendages, but so closely does the double peristome in both *Omalia oblongifolia* (76b) and *O. auriculata* (77b) resemble that of the *Hypnum distichum*, that in drawing the plants it seemed a waste of time to make separate drawings. Of the peristomes and I simply noted that "the inner and outer peristomes are as shown in sketch 77 (*Hypnum distichum*) - I may here mention that in the tracings of 77b and 76b. I copied in addition (at least such is my impression) the drawing of the peristomes of the *Hypnum distichum*, but neglected to make a note of it for your information. Again the *Hypnum falcifolium* which has also intermediate ciliola is, I find, to be arranged besides the genus *Omalia*, although its leaves have the peculiar reticulation of the true *Hypna*, which the *O. oblongifolia* & *auriculata* have not; while, on the other hand, the *Hyp. furfursum* which has the hexagonal cells like the *Omalia* is retained among the *Hypna*. Then the *Racopilum australe* which at the first glance, and on careful examination closely resembles the *H. furfursum* with the exception of the mitriform hood (vide specimens herewith) is placed by Payer next to the *Jungermannia*, although the *H. furfursum* is arranged next to the Ferns. You will observe that in both these mosses the hoods are covered with confervoid hairs.

Mr Wilson¹⁶, for whose List of N.Z. mosses I am much indebted, observes on No. 69 (*Physcomitrium*) that the specimen is too scanty for complete determination but he saw no trace of peristome. I thereupon sent him two or three other specimens. I am now able to send a tracing of a careful dissection of the only specimen I have. I find no trace of teeth; the internal membrane is exhibited in the drawing; the detached but slight discolorations on the edge of the membrane seem to arise from the decomposition of the contents of the cells of the operculum above – nothing of these would probably be seen in a fresh plant.; in these was seen no trace of cells in the membrane, but of course it is cellular in its structure. The shading round the edge of the operculum and the mouth of the capsule is intended to represent the coloured ring which is frequently seen in other mosses and may perhaps be the annulus, but I could not succeed in demonstrating its presence. As Mr Wilson is now richer in specimens than I am, he will probably have already determined whether there is an annulus.

Mr Wilson will be interested in the new Physcomitrium (79b). I trust he will have an opportunity of inspecting the tracing.

Believe me
Dear Sir William
Faithfully yours
Charles Knight" (Knight 1853a).

Barely a month later, Knight sent sketches of the Hepaticae to Hooker with the following note:

"... Auckland, 29 December 1853

My Dear Sir William

Since writing to you on the 26th of November, Sir George Grey has returned from the island of Mare and from visiting other islands in the vicinity of New Caledonia. You will see by the accompanying sketches that I have been busily engaged on the Hepaticae. I have had to collect and work at the drawings contemporaneously, so that what with my anxiety to do as much as possible before Sir George leaves for England, and my own official duties, I have not allowed myself sufficient time to arrange and complete what I have undertaken. I find on looking over the drawings many deficiencies and imperfections. Indeed when I commenced on the Hepaticae about two months since, I did not even know what to search for in my dissections. It was some time before I noticed the abortive pistillidia. You must make large allowances for a student entirely cut off from systematic works on the subject of his pursuits, and often without any clue to the characters. The slides if they reach you safe will be interesting and must be useful additions to your collections. Will you be good to inform me whether they reach you in good order – the specimens are preserved in glycerine and sealed with gold size, and are my first attempts Those sketches marked "Frullania" have never more than one abortive pistillidium. I notice that the width of the spiral thread varies considerably in different species (vide 18a & 18 b. b. b.)

The involucre leaf (2) of (18b) is shown with an appendage of four segments. I suspect an oversight here. Perhaps the middle laminae although united together are separate from outer laminae – these last being the appendages of the involucre leaves; but I have not time to determine this at present.

Sir George Grey thinks the sketches are worth being lithographed; but I do not think they are fit for publication in their present state; the original drawings were not made with any reference to publication, and many parts of them would require to be reduced and drawings of the entire plant supplied. Sir George does not mean that the publication would pay, but that the loss would not be more than about half the cost; while the publication would be useful and creditable to the colony. Possibly the Ray Society would cooperate and bear part of the expense in which case I would complete the drawings and render them more deserving of publication. I should certainly like to be informed whether the Society, if I furnished drawings of minute cryptogamic plants of unquestionable merit and novelty, would consider the publication of them at their expense as within the objects of their association, and whether or not they would be likely to publish them.

I shall be obliged if you would introduce my name to Mr Mitten as I should be happy to receive any communication from him or furnish him with any information respecting the Cryptogamic botany of these Islands I am able to afford him.

Believe me
Dear Sir William
Very faithfully yours
Charles Knight..." (Knight 1853b)

The following year W.J. Hooker wrote to Grey acknowledging Knight's additional notes on New Zealand mosses, and the drawings of the hepaticae, and again his tone is encouraging:

"...Royal Gardens, Kew, June 4, 1854

My dear Sir George,

I have examined the drawings & read the letters relating to them, of Dr. Knight, with very great interest. Many of these Mosses &c. ought to be published, if it can be managed: but the sale for such productions, & the cost of engraving, or lithographing is so great, that it will require much consideration. But I shall write to him very soon on this subject. Many of the species are recently engraved for Dr. Hooker's Flora. And this could be done but by Govt. (in this case Admiralty) aid. Now why should not Dr. Knight prepare a supplement of his new species? & why should not the Col. Office

give £100 towards the publication? & it might be done.

Anything you have for me, if not very bulky, can be let at Mr Lovell Reeves, Bookseller & Publisher, 5 Henrietta Street Covt. Garden. Anything bulky I can send a careful person for. If from the Docks, an order for receiving them will be required.

I have no morning engagements till the Crystal Palace opening day (Saturday the 10th) & any time that you can conveniently spare to come & see the Garden will suit me: especially if I can have a note to say so the day before.

Most faithfully

my dear Sir George

Yours,

W.J. Hooker..." (Hooker 1854).

Knight collections from Auckland account for 13 different taxa in the account of Musci prepared by William Wilson for the second part of *Flora Novae Zelandiae* (Wilson 1854) while 23 years later in the *Handbook*, Knight collections are recorded under 48 different names (Hooker 1867). However, not long afterwards Knight turned his attention virtually solely to lichens and in a letter to Joseph Hooker written on 14 April 1856, Knight was in buoyant mood about his progress:

"... I have been busy with the lichens. I have completed about 80 drawings of the asci, sporidia etc. I now draw with the aid of the Camera and have no difficulty in using it. I persevere. I am not quite certain that you are correct in your opinion that hair splitting and species mongering is owing as you state to a deficiency of early education in "Natural History as with all studies taken up late in life". What is meant by "late in life" I don't exactly know; but if you mean that when the intellect is sharpened by the work of years and when its tendency is to doubt, that it is then least fitted for original and new investigations then I believe you are mistaken. But I see clearly that it takes necessarily a long time to become acquainted with the facts of natural history, and while ignorant of them, you cannot generalise, and are likely to attach undue value to minute differences but those are the fault of the young; not of the tried and practiced intellect that knows where and how to find errors.

Even those who have given the better part of their lives to a particular pursuit have a strong love for species making. Wilson in his singularly painstaking work on the Byssaceae really annoys one by his doubts about species; and then his suspicion that all the *Hymenostroma* might be only varieties of *Weissia controversa* is too bad! Well may the philosophical student exclaim with you - "This is hair-splitting!" and refuse to admit genera which even if regarded as species shade away into each other for I have never yet seen the *Weissia controversa* with a trace of a peristome even by light transmitted through the operculum..." (Knight 1856).

Lichens continued to occupy Knight's spare time, virtually for the rest of his life, but he did not altogether abandon mosses and when opportunities arose he both added to his herbarium with collections of foreign mosses, and also collected local mosses and worked on them microscopically as the following letters show. In 1861 Knight wrote to Joseph Hooker about purchasing British mosses from William Mitten¹⁷ with whom he had just collaborated in a paper on New Zealand lichens (Knight & Mitten 1860):

"... A long time since Mr Mitten volunteered to send me a set of British Mosses. I did not like his giving them to me; so in reply I offered to take them on the usual terms. He sent me about 80 specimens with a promise to send the remainder; and I have heard no more from him. Those he has sent are of little use unless completed. I should wish to get the remainder on the usual terms; but I cannot tell whether Mitten dislikes selling them, as he has never alluded to the price. It may be he has found no time for looking them out... (Knight 1861).

In 1863, Knight wrote three times to Joseph Hooker about mosses. Firstly asking for a set from William Wilson: "... I hear nothing of Wilson's Mosses – Don't forget that I am purchaser of a good collection of South American or East Indian Mosses – Would Spruce¹⁷ supply a set of South American Mosses and Lichens? If he would I leave you to make terms with him, if he is a correspondent of yours and you have time to attend to such a troublesome person as I am..." (Knight 1863a). Then in October, while Joseph Hooker was wrestling with his account of mosses for the *Handbook*, Knight sent a more revealing letter, showing that his intentions for mosses were still alive:

"... I should have been delighted to be with you at work on the Mosses and the Jungermanniae. I have many useful drawings by me. I am thinking seriously of publishing an atlas of drawings of the Mosses. I can work on these with the crayon as? do most amateurs, but drawn in the style of T. West; I think I can catch his manner capitally. I have two or three times had in my mind to offer you a brochure on the Mosses in aid of the *Handbook* – I am sure some of Wilson's species will

not stand – especially some ODF the Brya and Hypna, but I cannot satisfy myself without I could inspect an authentic collection.

I notice what you say about the keys for the Mosses – I have not seen Sir William's edition of the Flora Britt. I have Wilson's. I agree with you that the binary system is not the best; if tabulated it spreads itself laterally to an inconvenient extent, as you may see in Jussieu's neat little work "Cours élémentaire d'Histoire Naturelle". Lindley's, or as you would write Bentham's, plan is capital.

But all this only makes me the more regret that I am so far away from you - even now, if you send me a set of the Mosses of which if I have time I will write a list, I will engage to let you have a paper on the Mosses with complete keys for the Genera & species which you may use or not as you please and I will return your plants with the proposed paper. I do not see any difficulty about the mode of sending them – They can be sent as a book parcel by mail; through Smith Elder & Co and two months after getting them I would return them through the Governor's despatch bag to the Colonial Office. At any rate I shall commence my work immediately and am quite satisfied that whether you can get it or not it will repay me for the trouble.

The natural arrangement of Mosses is full of difficulties. I cannot for the life of me satisfy myself what are the distinction characters of the genus Isoetecium. I think you would do well to transfer the whole batch of Wilson's species to the genus Hypnum. No two Botanists agree about them. Mueller has Wilson's nine species scattered right and left here a Neckera and there a Hypnum. Wilson has the Hypnum gracilis both among the Isoetecia and the Hypna - (a novel way of getting over a difficulty) – while Mitten refers to Stereodon along with I. arbuscula. Again Mitten changes the I. spininervium into Trachyloma [~~comosa~~ crossed out] arcuata and the I. Comosum into Trachyloma comosa while Mueller would make a Racopilum of the former one. Altogether it is a Babel! Yet it is not advisable to depart unduly from the arrangement adopted in your Flora unless it is very necessary. Supposing you keep to the Flora. I have just tried my hand at a key to the genus and this is the result.

Leaves nerveless or two nerved, operculum conical

Leaves widely ovate

Seta short, arcuate above

I. arbuscula

Seta longer, serpentine (somewhat sigmoid)

I. pulvinatum

Leaves narrow

I. angustatum

Leaves nerved

Capsule smooth, operculum conical

I. Menziesii

Capsule striated, operculum long, beaked

Nerve of leaf toothed at the back

Leaves marginate

I. marginatum

Leaves not marginate

Seta long, leaves distichous

I. spininervium

Seta short, leaves quadrifaceus

inner peristome without cilia

I. sulcatum

Nerve of leaf not toothed areola roundish

I. pandum

I may remind you that possibly Bentham's Introduction will require some addition to include phraseology of the Mosses. Hepaticae & Algae.

I will now refer to yr Flora for the names of the Mosses I am in need of. It is now 4 o'clock & the Mail closes this evening..." (Knight 1863b).

Five months later Knight was commenting on his efforts with *Sphagnum*, and acknowledging moss collections from Kew:

"... I hope you may have thought it best not to send me the specimens of New Zealand Mosses which I wrote to you about. This delectable war brings so many new duties upon me that literally I have not a moment to spare. If the Mosses come I will do what I can, and will certainly return them to you quickly... I have this morning been looking over my memo & analyses of the Sphagna of the Northern Island. I have not yet met with S. cymbifolium. The S. australe (?) herewith, resembles it, but is certainly distinct – the empty cortical cells of the stem (about 5 series of them) distinguishes it at once – both species however have spiral threads in the cortical cells of the branches, and this, supposing it to be the S. cymbifolium of Wilson, may have misled him as I see in the Bry. Britt. he lays much stress on this character as a peculiarity of S. cym. The only specimen of the S. cymb. I have seen is that in the W.A. collection of Drummond¹⁹.

I shall be greatly obliged to you if you can supply me with South American Mosses and Lichens as you kindly hold out the hopes of doing – You have already sent me Drummond's American Mosses and the 54 species of the Indian Mosses for which I am much indebted to you. The Indian Mosses were particularly welcome – Drummond's Mosses were a present from Sir William whom I have already thanked for his considerate kindness. You ask if I have received any antarctic Mosses or

Tasmanian Mosses from you – I have not received any. Nor have I seen Spruce's Pyrenaeian Mosses nor Drummond's Scotch Mosses – both of which I should [line missing] ...purchase them for me. - Tuckerman's also especially the Lichens..." (Knight 1863c).

In February 1865, James Hector was writing from Dunedin to Joseph Hooker "... Is there any one at work in the mosses at home? You know I suppose that Dr. Knight is bringing out a monograph of the N.Z. ones. Shall I let him have all Buchanans? B. finds he has nearly twice as many as those which are exhibited by Dr. Knight for the N. Island..." Burns & Nathan 2012: 57). John Buchanan's Otago mosses had five years earlier reached William Wilson, the leading British bryologist to whom the Hookers referred most questions on mosses (Galloway 2012a, 2012b). However, nothing came of Knight's intention to publish on New Zealand mosses and he evidently didn't consult Buchanan about his Otago discoveries either. In 1866, Knight wrote to Hooker to thank him for purchasing a set of Schimper's mosses:

"... In reply to your note of the 13th May 1865, in which you kindly informed me that you had purchased of Schimper²⁰ a collection of 200 rare Mosses, I remitted a P.O. Money Order for £4.2.6 -

As neither the Mosses have reached me nor you written about them further, I am uncertain whether the M. Order has reached you or Schimper's Mosses miscarried. Will you kindly tell me about them. The Government has disposed of the whole of its copies of the Handbook. How are you getting on with the second volume. I have very little time for the study of Botany. The Government has of late taken up my whole time by sending me about the country on Commissions, of which as I am always the President, the greatest portion of the work falls on me. Grey wished me to undertake the illustration of the Lichens Mosses and Grasses of New Zealand – I was to engrave them on stone with the needle after the manner of West. The expense of printing and paper was to be borne by the Governor. I had no sooner assented to the undertaking, then alarmed at the obligations I was about to incur I hastily withdrew my promise. I am busy building in Wellington trying to settle down. But these removals first to Wellington and then from one house to another make complete "pie" of my collections and things. These removes are as bad as a "fire". If it were not that my official duties suit me so exactly I would sell off and retire to England.

I am waiting daily in the expectation of hearing that you may be congratulated on your appointment to the Directorship of Kew Gardens – I trust it will not be long before I hear the news.

Dr Munro is now Sir David, & he is again elected Speaker of the House of Representatives. Lady Munro is in Wellington – a most amiable, gentle creature!..." (Knight 1866a).

When the set of mosses arrived safely, Knight acknowledged them thus:

"... I have allowed myself only a few minutes before the Mail closes to inform you that Schimper's Mosses arrived last week and I suppose in a week or two I shall be in receipt of Spruce's Crypts for which I return you many thanks for the trouble you have taken. I enclose two P.O. Money Orders for £15.17.0..." (Knight 1866b).

The following year, 1867, Knight was pleased to receive a consignment of Richard Spruce's lichens from South America (17th April 1867) and on 8 October he wrote to Hooker "...I send today to your address a collection of New Zealand Mosses in return for those you forwarded to me from Dr Schimper – Will you kindly forward the parcel to Dr Schimper & let me know what expense you incur..." (Knight 1867). Thereafter, there are no further comments on mosses in his correspondence with Joseph Hooker.

Knight's final contributions to New Zealand bryology were in two papers in the *Transactions of the New Zealand Institute*. The first in 1875, where he published descriptions and drawings of five new species of the moss genus *Gymnostomum* (*Pottiaceae*) (Knight 1875), and a description of a new species of *Fabronia* (Knight 1876) later shown by Dixon (1927: 278) to be a synonym of *F. australis* Hook. Although these two papers showed a continuing interest in moss taxonomy, and his ability at dissection, drawing and composing the illustrative plates (lithographed by John Buchanan) that accompanied the descriptions, none of Knight's new species gave details of date and place of collection (a common and infuriating difficulty for later students and monographers, and especially true for his lichen names) and most were later synonymised by Robert Brown *tertius*²¹ (Brown 1894a, 1894b) and H.N. Dixon (1927). However, two currently accepted moss names in New Zealand have Knight basionyms. These are: *Tortula areolata* (C.Knight) Fife and *Wiessia patula* (C.Knight) Fife (Fife 1995).

William Mitten described *Tortula knightii* Mitt. (in Wilson 1859: 174) [= *Tortella knightii* (Mitt.) Broth.],

and the liverwort *Marsupidium knightii* Mitt. (in Hooker 1867: 753-754; Hodgson 1958: 576-577) for Knight, honouring his contribution to New Zealand bryology (Wilson 1859: 174).

Notes

- 1 Robert Lynd (1816-1851). English soldier. Barracks Master from 1847 in Auckland. "...A man of scientific interests and considerable literary attainments, Lynd studied natural history in New South Wales and was a close friend of Dr Leichardt...He was associated with many charities and was a Vice President of the Auckland Mechanics' Institute..." (Scholefield 1940: 511). The Auckland auctioneers, Connell & Ridings, placed an advertisement in the *Daily Southern Cross* for 3 October 1851 (Vol. VI, issue 445, p. 2) "by order of the executors of the Late Robert Lynd Esq." of an auction to "sell by Public Auction at the residence of the late Mr. Lynd, Chapel-street, On MONDAY next, 6th inst., at 11 o'clock", "...THE HOUSEHOLD FURNITURE...A CABINET OF SPECIMENS. A handsome Cedar Cabinet, with drawers filled with arranged specimens of Natural History, Insects, Shells, &c., &c.
A large Collection of Botanical Specimens, from New South Wales, Norfolk Island, New Zealand, and elsewhere. These specimens are carefully preserved, arranged, and named, and will be accompanied by Catalogues and manuscript observations by their late owner.
- A Splendid Collection of stuffed BIRDS of Australia.
A NUMBER OF VALUABLE BOOKS A fine copy of *Don's Botanical Dictionary*, quarto – Lindley's Vegetable Kingdom – Lindley's Introduction to Botany – Botanique de Richard – Philosophy of Plants – Hooker's British Flora – Quetelet's Natural Philosophy – Mantell's Medals of Creation – Delabèche's Geological Manual – Bridgewater Treatises – Sprengel's Cryptogamous Plants – Swainson's Zoological Illustrations, 6 vols., coloured plates – Chambers' Information – Swainson's Birds – Erasmus Selby's Ornithology – Coleopterists' Manual – Humboldt's Travels – Mudie's Birds, Carpenter's Zoology – Maunders' Treasury of Natural History – Resolves (printed 1634) – Kerby's Creation – Greek Lexicon – Johnson's British Zoophytes – Loudon's Encyclopaedia – Cuvier's Animal Kingdom – Sowerby's Shells – Introduction to the Birds of Australia – Chambers' Journal – Hooker's Botany – Smith's English Flora – American Ornithology – Schlegel's Philosophy of Life – Quarterly Review – Philosophical Magazine – Edinburgh Review – Tract Societies Monthly Series, and about 100 volumes of Miscellaneous Works... Medallion of Leichardt, with autograph. Microscope. Backgammon Board and Men, and a variety of Miscellaneous Articles..."
- 2 William Swainson FRS (1789-1855). English naturalist, author, encyclopaedist and illustrator. A Committee Member of the New Zealand Company, who settled in New Zealand (Fern Grove in the Hutt Valley) in 1841. He was an adherent of W.S. Macleay's discounted Quinarian system of biological classification (Galloway 1978; Knight 1986; Natusch & Swainson 1987).
- 3 George Brettingham Sowerby (1788-1854). British naturalist (especially conchology) and illustrator. Second son of James Sowerby whom he assisted in the production of illustrated natural history books.
- 4 Edward Newman (1801-1876). British entomologist, botanist and writer. Editor of *The Entomological Magazine* and author of *A History of British Ferns and allied Plants*.
- 5 Georges Cuvier [Jean Léopold Nicolas Frédéric] (1769-1832) French, naturalist, zoologist, palaeontologist and anatomist, whose work is foundational to the study of vertebrate palaeontology.
- 6 Richard Owen FRS (1804-1892) English biologist, comparative anatomist and palaeontologist. First Director of London's Natural History Museum and an opponent of Darwin's theory of evolution by natural selection.
- 7 Matthias Jacob Schleiden (1804-1881). German botanist, and co-founder of the cell theory with Theodor Schwann and Rudolf Virchow.
- 8 Sir John Richardson (1787- 1865). Scottish naval surgeon, naturalist and arctic explorer. Co-author of *Fauna Boreali-Americana* (1829-1837).
- 9 John Edward Gray FRS (1800-1875) British zoologist; Keeper of Zoology at the British Museum from 1840 to 1867, when the natural history collections moved from Bloomsbury to South Kensington.
- 10 Joseph Greenwood (1818-1861). British soldier. In New Zealand from 1847 as Brigade Major on staff of Major-General George Dean Pitt and Major-General Robery Wynyard. He served in first and second New Zealand Parliaments, and on the Auckland Provincial Council. He had extensive property in Mangere. He died in London aged 42.
- 11 Johann August Ludwig Preiss (1811-1883). German botanist and plant collector who made large collections of plants from Western Australia between 1838 and 1842.
- 12 Jean-Baptiste Payer (1818-1860). French botanist, author of a well-illustrated account of cryptogams (Payer 1850) which Knight was evidently familiar with.

- 13 Henry Pelham Fiennes Pelham-Clinton, 5th Duke of Newcastle (1811-1864). Secretary of State for the war and the Colonies (1852-1854) in Lord Aberdeen's administration, and later Secretary of State for the Colonies (1859-1864) under Lord Palmerston.
- 14 Robert Brown FRS (1773-1858). Possibly the greatest of all British botanists – *facile Princeps Botanicorum* as he was designated by Humboldt. Discoverer of the cell nucleus, of protoplasmic streaming and the nature of pollination and fertilisation in plants. First Keeper of Botany at the British Museum (Mabberley 1985).
- 15 Stephan Ladislaus Endlicher (1804-1849). Austrian botanist and author of an important work, *Genera plantarum secundum ordines naturales disposita* (1836-1840), promoting a new system of classification. The section on Musci (pp 46-58) was obviously known to Knight.
- 16 William Wilson (1799-1871). British bryologist who contributed the accounts of Musci to both parts of *Flora Antarctica* as well as to those of *Flora Novae Zeelandiae*, and *Flora Tasmaniae*.
- 17 William Mitten (1819-1906). English pharmacist and bryologist specialising in liverworts. He wrote the accounts of Hepaticae for both *Flora Novae Zeelandiae* and *Flora Tasmaniae* and contributed in a major way to Joseph Hooker's treatment of the Hepaticae in the *Handbook of the New Zealand Flora*. Mitten's daughter, Annie, married Alfred Russel Wallace.
- 18 Richard Spruce (1817-1893). English botanist and explorer, who collected widely in South America and the Pyrenees
- 19 James Drummond (1787-1863). Scottish botanist and collector, Curator of the Cork Botanical Gardens 1808- 1829. He emigrated to Western Australia where he farmed (naming his farm *Hawthornden*), and made large botanical collections for later sale in England (Erickson 1966).
- 20 Wilhelm Philippe Schimper (1808-1880). French bryologist. Professor of Geology and Natural History in the University of Strasbourg, 1862-1879.
- 21 Robert Brown *tertius* (1821-1824?-1906). Scottish naturalist and shoemaker who emigrated to Christchurch in 1876. He became interested in mosses, travelling widely to collect them in South Island. He published 22 papers on New Zealand mosses between 1892 and 1902 (Simpson 1993).

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BIOGRAPHY / BIBLIOGRAPHY

■ Biographical Sketch – Cedric Smith (1891-1963)

Val Smith, 80 Mill Road, New Plymouth 4310.

Cedric Smith was born at Invercargill on 16 January 1891, the son of Robert Smith and Ada Emily née Bliss. He attended Southland Boys' High School and studied surveying and civil engineering at Otago University. His studies were interrupted by war service overseas and although he finally graduated in 1923, war disabilities left him unable to do much survey fieldwork. In 1921 he married Elsie (Elizabeth Keith Annand Simmers), the daughter of George Annand Simmers, rector of Timaru Boys' High School, and his wife Bella (Isabella Glen née Wallace). They honeymooned at Stewart Island, where Cedric had enjoyed holidays after his sister Ethel's marriage to Fred Traill.

Cedric spent a few years doing survey work in Timaru and Gore, then retired to Stewart Island on a full war pension, eking this out during the depression years by writing newspaper articles, selling insurance and doing survey work on the island. He and Elsie were both interested in natural history, and for 40 years they made collecting excursions from their homes at Mill Creek and then Halfmoon Bay. In the early days they sailed their 20-foot clinker dinghy *Marigold*, built by and purchased from Walter Traill, the postmaster, storekeeper and ranger on Ulva Island. Visitors with natural history queries were referred to Cedric and Elsie, and as their three children left the island for higher education, they began to specialise. Cedric worked on the orchids, and in 1947 suggested to Auckland botanist Dan Hatch that the Stewart Island form of *Thelymitra uniflora* was in fact *T. cyanea*, and sent him living material to prove it. About 50 of Smith's specimens are now in the Hatch Herbarium in the Auckland Museum. In 1952 Hatch described a variant of what we now regard as *T. cyanea*, naming it *T. venosa* var. *cedricsmithii* ... "gratefully dedicated to Mr Cedric Smith of Stewart Island, whose enthusiastic assistance has proved invaluable." Elsie painted the orchids, and Cedric also shipped fresh samples packed in moss for their daughter Judith, at school in Invercargill, to illustrate.

He then took up mosses, lichens and fungi until 1954, when the establishment of a Stewart Island museum took priority. When Rakiura Museum officially opened in 1960 he was the founding (honorary) director. Elsie made a comprehensive collection of Stewart Island shells for the museum, and another local resident, Eileen Willa, donated a herbarium of Stewart Island seaweeds and plants. Three years later, while Elsie researched at the Canterbury Museum, Cedric negotiated the repatriation of a Stewart Island artifact. The next morning, 27 June 1963, at their son's Christchurch home, he succumbed to a persistent heart condition. He was 72.

Elsie was a recognised expert on microscopic molluscs of southern New Zealand. Her scientific paper *Studies in the Stewart Island Mollusca* was meant to be the first in a series, but after Cedric's death she was unable to carry on. She donated her collection to the Dominion Museum (now Te Papa) in 1965, left the island soon after, and died in 1970. Her Stewart Island orchid watercolour paintings and drawings, with a few by Judith Robinson (née Smith), were compiled by Ian St George and published in 2012 as Number 18 in the New Zealand Native Orchid Group's *Historical Series*.



Thelymitra cyanea

Thelymitra cyanea

Orchidaceae

Thelymitra venosa var. *cedricsmithii*

Thelymitra (Greek: *thelys*, female; *mitra*, turban; referring to the hood of the column) is a genus of over 50 species, most of them Australian, of our most colourful ground orchids. The flowers open on dry days (hence the common name 'sun orchids') and are relatively simple compared to other orchids, having almost regular flowers without a differentiated hood or lip. *Thelymitra cyanea* (Greek: *kyanos*, blue) grows in lowland to low alpine swamps and bogs, up to 25 cm tall with a single linear, rounded fleshy leaf about half the length of the flower stem, and usually two bluish flowers from November to March.

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PUBLICATIONS

■ Publications Received

Wellington Botanical Society Newsletter, September 2013 Upcoming trips and meetings, submissions made, President's report, awards available, trip reports including Te Marua Bush, Wright Hill reserve.

The New Zealand Orchid Journal 130, November 2013 *Pterostylis irsoniana*, Marlborough Sounds orchids, the Western Australian adopt an orchid project, *Caladenia minor* family.

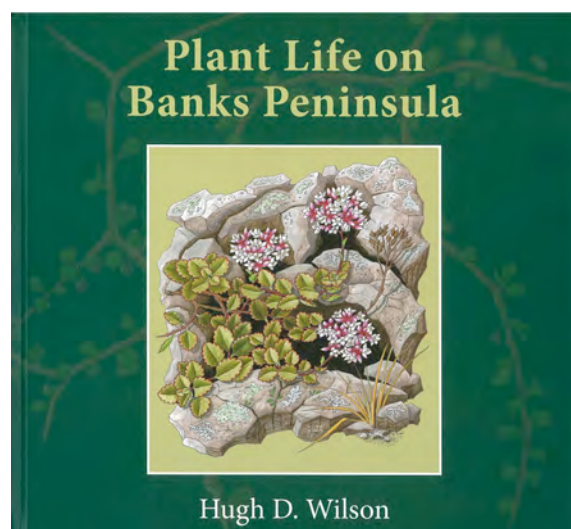
Canterbury Botanical Society Newsletter, September 2013 Upcoming meetings and trips, talk on streambank vegetation for whitebait, trip report.

Canterbury Botanical Society Newsletter, October 2013 Upcoming meetings and trips, talk on new botany tools, trip to Great (Rakaia) Island.

■ Book review - Plant life on Banks Peninsula

By Hugh Wilson
Published by Manuka Press, Cromwell,
New Zealand, 2013
Hardback, colour photos and drawings, 412 pages,
265 × 245 mm
ISBN 978-0-9583299-6-5
\$NZ90.00
Reviewed by Murray Dawson

The legendary Hugh Wilson needs little introduction to botanists, conservationists, ecologists and readers of his field guides. For more than 30 years, Hugh has been managing Hinewai Reserve on Banks Peninsula, Canterbury. Hinewai is a 1230 hectare reserve of regenerating native bush that is privately-owned and open to the public.



Following his precursory work, *Natural history of Banks Peninsula* (Wilson, 2009¹), Hugh is uniquely qualified to write this more extensive offering, *Plant life on Banks Peninsula*, which focuses on plants rather than overviewing the flora and fauna in his earlier title.

As these books tell us, Banks Peninsula is a volcanic landform jutting into the Pacific on the doorstep of the South Island's largest city, Christchurch. Once forested, Banks Peninsula was stripped of nearly all its trees and much of its original wildlife by two consecutive waves of human colonisation, Polynesian and European. However, the Peninsula remains a unique, biodiverse landscape.

¹ Reviewed in the *New Zealand Garden Journal*, 2009, Vol. 12, No. 2, pp. 29–30.

Publisher Manuka Press have a long association with Hugh Wilson. They have previously produced his popular field guides: *Small-leaved shrubs of New Zealand* (1993), *Field guide: Stewart Island plants* (1994), and *Wild plants of Mount Cook National Park* (1996). As stated on their website, Manuka Press is a small publishing company producing books primarily with a botanical theme from a home office in their spare time. In my view, the high production values and lack of typographic errors in this latest offering puts the proofreading of some larger New Zealand natural history publishing companies to shame.

The layout of *Plant life on Banks Peninsula* really is superb and the author and publishers have opted for a larger format (dare I say coffee-table style book?) than Hugh's portable field guides. This was a great decision; each page is laid out mainly in two columns, with text on the left and drawings on the right, but with enough flexibility to display Hugh's fantastic artwork at their best. Richard Broadhead and Colin Webb of Manuka Press should be thoroughly congratulated for translating Hugh's clear (originally handwritten!) text and drawings into a near flawless work.

As opposed to a photographic account of a local flora, such as those displayed so nicely in *Plants of Pukeiti Forest* (MacKay, 2011²), Hugh has prepared his own botanical drawings. Some black and white line drawings have been recycled from his earlier field guides, but the majority of his colour drawings are new. There are apparently more than 500 botanical drawings, of which more than 160 are in colour. To my admittedly untrained eye, the quality of Hugh's artwork seems at least as good as Audrey Eagle's (e.g., Eagle, 2006, 2013). Hugh displays a rare talent as an artist and botanical writer – it is an amazing achievement to have produced so much original artwork especially for this book, and to have written an extensive text for it, while also being fully committed to the management of Hinewai Reserve. More than 60 photographs are also included, taken by Hugh and those contributing images to the book.

I recognise some of the introductory chapters from *Natural history of Banks Peninsula*, expanded for this current work and entirely appropriate as a similar story needs to be told – the eyewitness accounts of fires and chronological figures (3.1–3.5) of deforestation are particularly sobering. Likewise, species distribution maps and checklists have been adapted from the earlier title and located towards the rear of *Plant life on Banks Peninsula*. The addition of ticks in these checklists shows which species are illustrated compared to a total vascular flora of >1100 species, more or less equally divided between native and naturalised, to be found on Banks Peninsula.

After the first 47 introductory pages covering natural history (e.g., Banks Peninsula past and present, human influences, altitude, climate, rainfall and soils), the main body of the book profiles species groups arranged by chapter (pp. 48–338). This arrangement works well; there are the usual groupings you would expect (e.g., trees, shrubs, climbers, ferns, grasses, rushes and sedges, native orchids), and also some less orthodox groupings that nevertheless make sense for Banks Peninsula (e.g., chapters entitled “Gaudy succulents from Mediterranean climates”, “Plants on rock outcrops – bastions of biodiversity”, “Nowhere else – endemic to Banks Peninsula”). Cryptogams, the non-vascular plants including mosses, liverworts, lichens and fungi, are not overlooked and have a chapter dedicated to them.

It's great to see inclusion (in a chapter entitled “Rare, going, gone”) the rediscovery in February 2012 of *Pittosporum obcordatum* on Banks Peninsula, after a gap of 170 years (p. 314). *Piptochaetium depressum* (Chilean rice grass), a new grass weed for New Zealand found at Camp Bay on Banks Peninsula, is also listed (p. 372). Discoveries and rediscoveries such as these on Banks Peninsula are documented by Hugh Wilson in a recent *New Zealand Botanical Society Newsletter* article (June 2013, No. 112, pp. 18–20).

Text at the beginning of each chapter makes for fascinating, and at times entertaining, introductions to the species entries that follow. Species are numbered according to their order of appearance, with naturalised species prefixed by asterisks. Species are followed by their family name in brackets. Meanings of the binomials are usefully provided underneath, first for the genus, and on the next line down for the species (and indented to line up with the species epithet). Common and Māori names are right justified. Underneath these names are concise botanical descriptions followed by a paragraph (in smaller font) on habitat and distribution notes of each species found on Banks Peninsula. This is much the same style as Hugh's field guides (Wilson, 1994, 1996). Some botanical

² Reviewed in the *New Zealand Garden Journal*, 2011, Vol. 14, No. 2, pp. 24–25 and the *New Zealand Botanical Society Newsletter*, March 2012, No. 107, pp. 23–24.

names used follow a conservative taxonomic approach (e.g., *Hebe* instead of *Veronica*, and some older genus names for the orchids), and the alternative names are provided in brackets.

I have always considered that descriptions are notoriously difficult to present in a popular work – they need to be technical enough to accurately describe a species, but simple enough to be understood by the majority of readers. Hugh achieves this balance brilliantly and seemingly effortlessly. Hugh's descriptions are never dry and his clear and easy writing style always presents the information needed.

Differences between similar species are explained clearly and concisely throughout and demonstrate Hugh's remarkable knowledge of the local (and wider) flora. For example, I took a recent photograph of a poroporo in flower at Hinewai. Hugh's book explains that two very similar species occur on Banks Peninsula – *Solanum aviculare* and *S. laciniatum*. He clearly explains and illustrates the floral differences that distinguish them – *Solanum aviculare* has smaller flowers that are a paler blue, and star shaped, with pointed petals, whereas *S. laciniatum* has bright purple blue flowers that appear frilled and are notched at the top of each petal (p. 91).

Similarly, I photographed a *Parsonsia* (a native jasmine) growing at Orton Bradley Park on Banks Peninsula. Due to leaf variability and lack of flowers, I was not confident to assign it to a species. Hugh's book confirms that both *P. capsularis* and *P. heterophylla* grow on Banks Peninsula, and "Although highly variable in leaf shape nationwide" he reassures that "*Parsonsia capsularis* differs from *P. heterophylla* on Banks Peninsula in the very narrow ... wavy-edged adult foliage...". He then clearly illustrates these differences by colour drawings (p. 105).

Concluding chapters present plant distribution patterns and maps (pp. 339–348), checklists of plants (native and naturalised vascular plants, and hybrids; pp. 349–380), a reference list focussed on Banks Peninsula literature (pp. 381–382), glossary (pp. 383–388), and an index of botanical, Māori, and common names (pp. 389–411).

Hugh's previous field guides to Stewart Island and Mount Cook are regularly used by people identifying native and naturalised plants from other regions in New Zealand, because the majority of species treated are not confined to the regions in the guides. The same is true for the Banks Peninsula flora, so this new book has wider utility.

This excellent book is a rare fusion of science, art, clear writing style, and flawless layout. Moreover, *Plant life on Banks Peninsula* provides an indispensable guide for appreciating the special plants of the peninsula adjacent to the "car infested swamp" of Christchurch that "invades the lower spurs of the Port Hills" – to use Hugh's sentiments – and the flora beyond.

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