

NEW ZEALAND BOTANICAL SOCIETY

NEWSLETTER

NUMBER 76

JUNE 2004



New Zealand Botanical Society

President: Anthony Wright
Secretary/Treasurer: Aaron Wilton
Committee: Bruce Clarkson, Colin Webb, Carol West

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Subscriptions

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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 28th 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 September 2004 issue (77) is 28 August 2004.

Please post contributions to: Joy Talbot
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Send email contributions to joytalbot@free.net.nz or talbotj@cpit.ac.nz. Files are preferably in MS Word (Word XP or earlier) or saved as RTF or ASCII. Graphics can be sent as Corel 5, TIF JPG, or BMP files. 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. Macintosh files cannot be accepted so text should simply be embedded in the email message.

Cover Illustration

Geoff Baylis. This Murray Webb caricature was commissioned by David Holdsworth and presented to Geoff for his 90th birthday in November 2003. [Taken from a copy kept by David Holdsworth.]

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New Zealand Botanical Society News

▪ From the Secretary

Resignation of Secretary/Treasurer

Unfortunately I've had to resign mid-term as the NZBS Secretary/Treasurer, as I'm moving to Australia to live. I've enjoyed my time as Secretary/Treasurer and have taken a great interest in the many and varied articles that are published in our Newsletter. There are many people I'd like to personally thank for helping me with all the various tasks but most especially I'd like to thank Joy for all the hard work she's put in as editor during my tenure. I'll still be a NZBS member in Australia and will be keeping a close eye on all the botanical activities back in NZ.

Doug Rogan

▪ From the President

We were very sorry to receive Doug Rogan's resignation as Secretary/Treasurer of the Society, a post he had held since 2002. Doug resigned as Collections Manager Documentation at Canterbury Museum to move to Australia with his wife Gabby and young son Nathan to be closer to Gabby's family. They will live in Canberra; initially Doug will be commuting between home and Sydney, where he takes up a post as Senior Collections Management Consultant with International Conservation Services.

Doug helped with production and mailing of the Society *Newsletter* for many years while at Auckland Museum; for this and his more recent work as Secretary/Treasurer we offer sincere thanks.

I'm pleased to announce that Aaron Wilton has been appointed Secretary/Treasurer for the remainder of the year by the Committee. We are grateful to Aaron for taking on this role; for the time being, the mailing address for the society remains unchanged (see inside front cover). Aaron can be contacted directly, if necessary, at wiltona@landcare.cri.nz or 03 325 6700.

Joy Talbot, our *Newsletter* Editor, has indicated that she may have to step down at the end of 2004 due to pressure of work. Any member interested in this job should contact a committee member in the first instance; meanwhile many thanks to Joy for continuing to produce the *Newsletter* each quarter.

Anthony Wright, c/- Canterbury Museum, Rolleston Avenue, Christchurch 8001

Regional Botanical Society News

▪ Auckland Botanical Society

March Meeting and AGM

The AGM was followed by a video presentation by Geoff Davidson showing some highlights of the December trip to New Caledonia, and a talk with slides by Ewen Cameron on the January trip to Lake Ohau in the South Island.

March Trip

Colin Bradshaw from the Auckland Domain nursery assisted Mike Wilcox in leading members around some of the great variety of planted exotic and native trees that are present in the Domain. Planting started there in the early 1850s. Our visit resulted in the discovery by a couple of our members of an exotic pest, Florida red scale, resulting in the closure of the Wintergarden glasshouse.

April Meeting

We welcomed Cathy Jones, good friend to the ABS, as speaker this month. Cathy spoke on the area in Northern Pakistan where she has worked and trekked four times in the last six years. Her slides illustrated the people, places and plants of this remote and interesting part of the world.

Easter Trip

Fifteen members stayed in the Hamilton Tomo Group's lodge, and visited several reserves in the limestone rich country surrounding Waitomo. A day was spent exploring the frost flats at Pureora, and there the opportunity was taken to view *Dactylanthus taylorii* on the Totara Walk near the HQ.

April Trip

The morning was spent exploring the vegetation along the edge of the Oteha Stream at Albany. While this is a narrow weed-infested stretch, there are also interesting native species, chief of which is a good population of *Leptinella tenella*. After lunch we visited Brookfield Reserve, which is sandwiched between two parts of Massey University. This hidden reserve contains much of interest, including hard beech and *Alseuosmia quercifolia*.

May Meeting

Bec Stanley, Auckland DOC's threatened plant botanist, compared some of Auckland's secret places as they were when Thomas Kirk surveyed the city's plants in 1870, and how they are now. Drainage, development, road works, weeds and animal pests have all taken a toll, but amazingly, some rare species are still clinging on. Bec has the task of deciding how best to protect the plants and enhance the habitat, and left us wondering what her counterpart will find in another 134 years.

May Trip

Murphys Bush is a Manukau City Reserve in Flat Bush. Surprisingly, ABS has never visited this reserve before. With 14 ha on one side of Murphy Road, the reserve has recently been enlarged by the addition of a slightly smaller area on the other side of the road. Kahikatea, rimu and taraire are the main canopy trees, with thickets of nikau beneath, and an abundance of passion vine.

FORTHCOMING ACTIVITIES

2 June	"The NZ Grammitis ferns" Barbara Parris
19 June	Hinton's Bush, Hatfields Beach
7 July	"Reproductive Biology in NZ: mastings, mutualism and mistletoes" Dave Kelly
17 July	Workshop on dicot classification and plant families
4 August	"Origins and diversification of the NZ flora" Steven Wagstaff
21 August	McElroys Bush, Mahurangi

Maureen Young, 36 Alnwick Street, Warkworth. Email: youngmaureen@xtra.co.nz

■ **Waikato Botanical Society**

Maungatautari field trip - 5th October 2003

For this field trip, led by Bruce Clarkson, Waikato folks were joined by some members of the Rotorua Botanical Society and Maungatautari Ecological Island Trust. We began from the Dean property, through pukatea, mangeao and tawa forest, with plenty of supplejack in the understorey. Along the way a few fuchsia (*Fuchsia excorticata*) trees were flowering near the bush edge. As we headed up the ridge the small uncommon shrub *Alseuosmia quercifolia* was seen along with an abundance of other regenerating understorey species such as hangehange (*Geniostoma ligustrum* var. *rupestre*), kanono (*Coprosma grandifolia*), shining karamu (*C. lucida*) and toropapa (*Alseuosmia macrophylla*). *Nestegis* sp. and *Mida salicifolia* saplings and trees were seen on the ascent, and higher up the mountain *Astelia fragrans* and *A. trinervia* all showing signs of successful possum and goat control. A karaka tree was a surprise half way up the mountain, a sign of Maori travellers long before us. Also spotted, *Blechnum vulcanicum*, close to its northern limit, and up on top some of the hardy, sun-loving shrubs and herbs. On a rocky point at 680m *Gaultheria antipoda* and *G. paniculata* formed a hybrid swarm, and *Thelymitra* orchids were not quite in flower. On the descent we saw *Corybas acuminatus* in flower amongst *Pterostylis trullifolia*. Nobody spotted any *Dracophyllum* species, which are unusually absent from the mountain's flora. The highlight - a very healthy population of mistletoe (*Ileostylus micranthus*) growing on a large mangeao in a paddock. This is the first time mistletoe has been recorded on the mountain and the healthy looking plants are likely the result of some diligent possum control on the pasture edge here. The day ended at a remnant patch of swamp maire (*Syzygium maire*) growing in a gully on Bruce Dean's farm. Liz Grove

AGM and Taranaki coastal herbfields – April 5th 2004

The year started off with the AGM, followed by a talk by Douglas Bridge, PhD student at the University of Waikato. Doug gave a fascinating insight into these, for most of us, little known plant communities, battled by wind, salt spray, cattle grazing and invasion by aggressive weeds. There are quite a number of key endangered plants among them, especially in the genera *Ranunculus*, *Oreomyrrhis*, *Limosella*, *Crassula*, *Sagina*, *Myosotis*, *Colobanthus* and *Plantago*. Doug has studied 17 sites in Taranaki, the large majority on private land. Most of the landowners were very helpful, but curious to what Doug was doing in the often dreadful weather. The key factor in the grouping of plants relates to the ratio of *Zoysia minima* to *Selliera radicans*. *Zoysia* forms dense mats, almost cushions, which are favoured by certain plants, but the diversity is quite low. *Selliera* is more moisture loving and forms mats that are

looser, which benefits quite a number of species. Grazing has obviously a major impact on these plant communities. Unfortunately, fencing is not a real solution either. Without grazing, the weeds grow bigger, lusher and more aggressive, and threaten to overwhelm the native plants. To study restoration Doug has cut out squares of turf and transplanted these to a bare spot outside New Plymouth. After some initial worry, the plants are now growing, which is indeed very good news. *Sven Johnsson*

Kinleith Forest Wetlands fieldtrip – May 2nd 2004 (a joint trip with Rotorua Bot. Soc.)

This trip was organised by Paul Cashmore of the Rotorua Bot. Soc. and lead by Robin Black, an environmental planner for Carter Holt Harvey. Robin's role is to oversee the management of significant natural areas within the forest, where the economics of utilising the pine forest is balanced against the protection of these remnants. Our first stop was at one of the few remaining manuka wetlands in the area, a part of the upper Waihou River. Even though we were looking at a narrow strip of wetland, there was a remarkable variety of plants, and a healthy grove of mature cabbage trees (*Cordyline australis*) was a major feature. On the northern edge, were some good stands of regenerating tanekaha (*Phyllocladus trichomanoides*) and kahikatea (*Dacrycarpus dacrydioides*). Two of the more unexpected finds for the day were plants of *Dracophyllum strictum* clinging to the cut over banks above the wetland and, in the last area we visited, the Butler Road Lake, plants of the rare *Ranunculus macropus*. *Doug & Jane Ashby, and Jane Hart*

UPCOMING EVENTS (all on Sundays)

13 June Workshop (Topic and venue to be announced).
4 July Waingaro forest remnant restoration fieldtrip.
8 August Mauao (Mt Maunganui) fieldtrip (with Rotorua Bot. Soc.).
26 September Karangahake Gorge fieldtrip

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Secretary: Liz Grove: egrove@doc.govt.nz

Waikato Botanical Society, c/- Biological Sciences, University of Waikato, Private Bag, 3105, Hamilton

■ **Wellington Botanical Society**

31 December 2003 – 11 January 2004: West Coast and Murchison

What a wonderfully varied trip we had botanising in wetlands, beech forests, coastal forest, and on open tops! A New Year's trip in the great BotSoc tradition for 28 WBS members.

We had two base camps: six days at Riccarton High School's Kokiri Lodge, near Stillwater, then six days at Nelson College's Mataki Lodge near Nelson Lakes National Park. Both are excellent facilities.

Chris Horne

1 Jan: Sewell Peak to Mt Davy, Paparoa Range
2 Jan: Mt Te Kinga
3 Jan: Point Elizabeth Walkway
4 Jan: (1) Croesus Track, Paparoa Range
4 Jan: (2) Otira Track
5 Jan: (1) Noel Hardie's and Rachel McGillivray's Bog, Kokiri
5 Jan: (2) Goldsborough Track
6 Jan: Charleston
7 Jan: Jameson Track – Mole Stream
8 Jan: Oxnam's Bog
9 Jan: (1) Mole Tops
9 Jan: (2) Spur towards bush tarns behind the lodge

Saturday 24 January: Off-track Otari – Wilton's Bush

Going down through the planted beeches twelve of us inspected the *Ileostylus micranthus* mistletoe planted recently by Otari staff. We then had an opportunity to distinguish male from female kahikatea by their tiny cones and minute ovules. We later found *Hymenophyllum diaphanum*, not previously listed, various *Polystichum* species, wharangi seedlings and the small-leaved milk tree, *Streblus heterophyllus*. The roosting kingfisher colony's "Pukatea Hilton" was much admired.

Chris Horne showed us one of his possum bait stations which, along with seed-dispersing birds and the rainy summer are responsible for the remarkably abundant regeneration.

Saturday 14 February: Onoke Spit

Thirteen members, including some who had camped snugly on Friday night among dense *Plagianthus divaricatus*, set off along Onoke Spit, 3 km of sand and gravel separating Lake Onoke from the sea. It supports a now uncommon association of coastal plants: *Austrofestuca littoralis* (hinarepe/sand tussock); *Spinifex sericeus* (koowhangatara/silvery sand grass); *Desmoschoenus spiralis* (piingao/golden sand sedge); *Calystegia soldanella* (panahi/shore bindweed); *Carex pumila* (sand sedge); *Raoulia australis* (scabweed); *Pimelea* cf. *urvilleana* (pinaatoro/sand daphne) and *Cyperus ustulatus* (upoko tangata/giant umbrella sedge). We saw no *Eryngium vesiculosum* (sea holly).

Off-road vehicles had caused deep wheel ruts and damaged *Raoulia* mats and *Pimelea* plants. They also disturb the bird population and their nesting sites.

Saturday 24 April: Workbee, Druce property, Pinehaven

Nine members spent an enjoyable day at Helen Druce's property working in the planted native forest, so painstakingly won by Tony from the pine forest decades ago. Activities included: mulching, track clearing and weeding, although there was little of the latter required - testimony to the success of Tony's "living laboratory".

Barbara Mitcalfe

President: Vicky Froude (04) 233 9823 (home)

Secretary: Barbara Clark (04) 233 8202 (h); (04) 233 2222 (fax) P O Box 10 412, Wellington 6036.

■ **Nelson Botanical Society**

Beeby's Knob, 15 February

Fourteen people in three 4WD vehicles met up at the gate off Tophouse Road, and one member joined in at higher altitude, having climbed up through the paddocks. Clear sky and strong southerly winds, which were forecast to ease from 70 kph to only 50 kph, welcomed us at the hut site! We moved quickly through the low shrubland of *Halocarpus biformis*, *Lepidothamnus laxifolius*, *Phyllocladus alpinus*, *Podocarpus nivalis*, *Dracophyllum pronum*, *Aristotelia fruticosa*, *Empodisma minor*, some species of *Hebe* and *Pimelea*, plus a few flowering *Brachyglottis bellidioides*, and *Anisotome aromatica*. We finally reached wind-sheltered areas and could begin botanizing. *Gentiana bellidifolia* in full flower covered the meadow where we enjoyed lunch in the sun. The mosaic of *Coprosma perpusilla*, *C. fowerakeri*, *Pentachondra pumila*, *Cyathodes dealbata*, and *Pittosporum anomalum* gave us much to learn about and discuss. On our way back to the cars, we saw *Neopaxia calycina* on open ground, a few "circles" of *Chionochoa australis*, and a memorable show of *Chionochoa rubra* waving in the strong wind.

Liselotte Seckler

March 21, Inwoods Lookout and North Peak

Six people set off up the track from Inwoods Lookout, having driven past *Olearia avicenniifolia* flowering on roadside banks. We did not botanize the first stretch through the forest, but slowed down to look at plants once we were in open country. We stopped in the lee of a large rocky outcrop (home to *Raoulia bryoides* and *Hebe cryptomorpha*) for lunch. Wonderfully stubby divaricating plants of *Pittosporum anomalum* nearby were as intriguing as ever. Four of the party continued from there up to the top of the Gordon Range at around 1500 metres asl. It was great to see *Parahebe cheesemanii* in its camouflage gear in stable scree near the top. Three species of gentian were in flower: *Gentiana* aff. *corymbifera* higher up, *G. tenuifolia* with its purple-striped petals low down amongst beech forest remnants, and *G. aff. bellidifolia* in between. We battled with strong cold winds all the way, but the conditions didn't prevent us from enjoying our day.

Cathy Jones

April 18, Browning Track ultramafic

Fourteen BocSoccers left Nelson in cloud for the Hackett River and Browning Stream. The cloud soon cleared revealing a fantastic clear autumn day. We made good time getting to the interesting mineral belt vegetation, where we discovered the mineral belt gentian (*Gentiana* "stellar") still in full flower along the tracks, as well as profusely fruiting korokio (*Corokia cotoneaster*), both the orange- and red-fruiting forms. It was certainly the time of year for fruit, with *Gaultheria antipoda* and *Leptecophylla juniperina* (the new name for prickly mingimingi) showing off their variously coloured fruits, ranging from white to deep wine red. We noted that pine infestation in this area from nearby plantations is becoming a major problem. This is the single biggest threat to our nationally unique mineral belt ecosystem. Wasps were also prevalent, and a few of us were stung.

The other ultramafic endemics we encountered were mainly along the damp water courses by the track, and included the large silver-grey tussock variety of *Astelia graminea*, the grasses *Festuca ultramafica* and *Trisetum serpentinum*, an unnamed colobanthus (*Colobanthus* "serpentine"), two

sedges *Carex devia* and *C. traversii*, and the unnamed woollyhead *Craspedia* "Hackett", which is totally confined to this area. Everywhere tanekaha (*Phyllocladus trichomanoides*) saplings and seedlings were evident, and if not taken over by exotic pines will become the dominant species.

Near the confluence of Browning Stream, we encountered *Pittosporum divaricatum*, which we debated over for a while, and started collecting a small selection of fungi to augment the planned address by mycologist Peter Johnston at the AGM the next evening. On the fruiting theme, we came across a *Coprosma propinqua* female totally covered in translucent white fruit, while adjacent to it plants of *Neomyrtus pedunculata*, one of them heavy with large pendent orange berries and another with smaller red berries. On the return trip, we took another look at the real *Melicactus alpinus* s.s. (porcupine shrub), which in our region has several unnamed species closely resembling it, and its peculiar hybrids with *Melicactus obovatus*, which occurs on the nearby limestone. *Shannel Courtney*

FUTURE TRIPS (all on Sundays)

June 20 Faulkner's Bush, Baigent's Bush, and Snowden's Bush. Pamela Sirett 542 3414
July 18 Boulder Bank. Gay Mitchell 548 3351
August 15 Fern interactive key workshop at DOC. Patrick Brownsey, Cathy Jones, 546 9499

President: Cathy Jones (03) 546 9499 Flat 2, 5 North Rd, Nelson. Email: cjones@doc.govt.nz
Treasurer: Gay Mitchell (03) 548 3351 13 Albert Rd, Nelson.

■ Canterbury Botanical Society

March meeting

Ryan Young spoke on Native Restoration in New Zealand & NZERN (New Zealand Ecological Restoration Network) computer databases. In his talk Ryan covered some of the many restoration projects around New Zealand as well as some Christchurch sites. The later included Carlton Mill Corner where the riparian planting has caused much controversy of late in the "Native verse Exotic" debate, and Travis Wetlands, important to the plains remnant vegetation.

NZERN is a national community based volunteer organisation based around its website www.bush.org.nz, set up to provide and share information on restoration. Two useful databases on this website are Planterguide, www.bush.org.nz/planterguide: an interactive tool with soil keys and planting keys to the 85 ecological regions of NZ, and Plantgrow, www.bush.org.nz/plantgrow: a propagation tool with information on habitat, flowering times, prop methods and tips. *Ryan Young*

March Field Trip

Nine members explored the forest of Akaroa Domain, led by Warwick Harris. Exotic specimen trees planted last century tower over a dense canopy of native and exotic shrubs, saplings and herbaceous plants. Many of the natives persist from the many species introduced by Arthur Ericson, who retired to Akaroa in the 1960s and at whose suggestion the Domain became known as the Garden of Tane. Our opinions were sought to assist in deciding a management plan for the Domain. *Bryony Macmillan*

April meeting

Colin Meurk spoke on "Australia & South Africa - is this New Zealand in the Tertiary?" The talk was developed around experiences in South Africa and north and eastern Australia; it highlighted Gondwanic connections and contrasts. During the Tertiary, NZ was a low-lying archipelago with a subtropical climate and heavily leached, old, infertile, lateritic soils, perhaps more like the warmer African and Australian continents of today. Reminiscent of NZ in the Tertiary, the open leached landscapes of S Africa (the biodiverse fynbos (fine bush)) are dominated by restiads and small-leaved daisy and heath shrubs. In Australia the equivalent is heathland and mulga.

April Field Trip

Di Carter, Port Hills Ranger with the City Council led a small group up Bowenvale Valley on the Port hills. This is a popular multiuse area and Di explained to us the programme of woody weed control, the management of sheep, and ongoing planting of flax, broad leaved species and podocarps. The intention is to establish a wooded corridor from the harbour side into the head of the valley and down the gullies. Although dominated by lightly sheep-grazed silver tussock grassland, the tributary streams and craggy outcrops contain vestiges of native shrubland. *Bryony Macmillan*

May Field Trip

Prices Bush, mid way up Prices Valley, Banks Peninsula is a 4 ha remnant of modified-primary, valley-floor forest protected by QE II covenant. It must be virtually the only place where one can still

drive under a canopy of tall podocarp trees in lowland Canterbury *Microlaena polynoda* was common along margins, and a few *Teucrium parvifolium* remain beside the roadway. The two mistletoe species *Ileostylus micranthus* and *Korthalsella lindsayi* were quite common, seen on a number of host plants. *Melicytus micranthus* and *M. ramiflorus* were both common, plus many plants with hybrid characteristics.

Miles Giller

JULY MEETING: Friday 2 July "Changes in vegetation at Franz Josef Glacier over 120,000 years of soil development". Speaker: Sarah Richardson, Landcare Research.

Secretary: Margaret Geerkens (03) 352 7922 PO Box 8212, Riccarton, Christchurch.
Email: bert.marg@xtra.co.nz

▪ Botanical Society of Otago

AGM & Gardens Without Weeds? Helen Leach, Dept. of Anthropology, Otago University - April 2004
Early Europeans to visit NZ noticed very few weeds in Maori gardens – were Maori efficient at weeding or were weeds lacking? Maori had a style of agriculture known as swiddening, where native bush is slashed and burnt to remove most of the forest cover, the land is cropped for about 2 years, then the site is left fallow for 14 – 25 years. Such a system does not allow conditions in which weeds and other problems such as pathogens can develop. Helen considered that native species lack invasiveness due to their relatively slow growth, and the ease with which they can be pulled out. The plants that arrived in association with Polynesian people, including *Oxalis corniculata*, swamp shield fern, glossy nightshade and *Sonchus*, had little impact in gardens compared to the problems reported once the European weeds started to appear. It appears from Helen's research that Maori really didn't have invasive species in their gardens. Did the Maori therefore have a weed concept? Helen fairly convincingly showed that traditional Maori/Polynesian words for bush only later, once Europeans and their plants had arrived, came to have the negative connotation of weediness.

Ian Radford

Blue Mountains, 13 March

The summit area (c. 1000 m) of the Blue Mountains offers an accessible example of the Southeast South Island's sub-alpine vegetation. The complex of peatlands includes shrubland, tussock grassland and various bog communities and tarns. In the shrubland *Dracophyllum longifolium* dominates. As well as the dominant *Chionocloa rigida*, the tussock grassland contains abundant *Gaultheria* spp., *Astelia linearis*, *Aciphylla aurea*, and several *Celmisia* spp. The bog communities included areas of *Donatia* cushion, with the cushion-forming species *Celmisia argentea* and *Phyllachne colensoi* also occurring. Cushions were often interspersed with grey-white strips of the lichen *Thamnolia vermicularis*. Several species (e.g. *Astelia linearis* and *Celmisia glandulosa*) reaching their eastern limit here. Also seen were *Leucogenes grandiceps*, *Celmisia semicordata* subsp. *aurigans*, pygmy pine, *Lepidothamnus laxifolius*, and an abundance of *Aciphylla scott-thomsonii*. Large patches of exposed peat, the result of fire, also occur on the summit. Grey-bleached branches give evidence that these bare peat areas were once dominated by *Halocarpus* shrubs.

This is a fragile landscape, easily accessible, which is very vulnerable to damage if visitor pressure increases. In addition, with large conifer plantations occupying the lower slopes frequent eradication of wilding conifers infestations will be needed.

Norman Mason

Rock and Pillar Range, 3rd April

The first stop was at about 1250 metres by a snowbank to look for slime moulds that apparently appear with the melting snow. *Celmisia viscosa* and *Hebe poppelwellii* were prominent beside the track. A good number of cushion species including *Raoulia grandiflora*, *Raoulia hectori*, *Phyllachne colensoi*, *Anisotome imbricata* var *imbricata* and *Dracophyllum muscoides* were common on the exposed summit plateau. The small cushion plant *Kelleria childii* was observed in flower. Sheltering from the wind behind a massive blocky tor on the ridge crest we found *Pachycladon novae-zealandiae* growing in the crevices in the rock was and, surprisingly, a small filmy fern that was not identified. A little bit of fossicking under rocks revealed the large weta *Hemideina maori*. Beside the weta was a little pile of its droppings that were scooped into an envelope by a delighted mycologist to be taken back to the lab and cultured for unusual fungi.

David Lyttle

Waipori Forest fungal foray. 1st May

Our foray started in the car park for the Berwick Track where David gave us a few important tips to collecting fungi including; to note what substrate the fungus was growing on, ensure the base of the mushroom is included when taking a specimen and that a collection should comprise three specimens

so that sample identification is possible. We collected in broadleaf forest, manuka (*Leptospermum*) forest where it was a little drier, and along the Waitahuna River with an overstorey of beach (*Nothofagus menziesii*). Upon returning to the Department of Botany, all of the collections were displayed on the lab benches. The number of different fungi collected in just a few hours was impressive and the diversity of forms amazing. Colours of the fungi ranged from red, orange, green and purple to the expected brown tones. Representatives from a range of genera were found including *Cortinarius*, *Mycena*, *Russula* and *Lactarius*.

The following day David returned to Waipori Forest and was able to make a further collection of an undescribed specimen that may be a new species of *Lepista*.
Arlene McDowell

FORTHCOMING ACTIVITIES

12 June Moores Bush, followed by afternoon cryptogam identification workshop
16 June *Oregon, Europe & Dunedin: Plants, Gardens & Seed*. Tom Myers, Botanical Services Officer, Dunedin Botanic Garden.
21 July *Pachymenia* - a question of species - Lisa Russell
25 July Tavora Reserve (Bobby's Head), with Pat Mark
18 August *Growing New Zealand Alpine Plants* - Dr David Lyttle, Otago Alpine Garden Group
21 August Southland Community Nursery, Otatara, Invercargill
13th October 3rd Annual Geoff Baylis Lecture. To be given by Henry Connor

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■ Other Botanic Society Contacts

Manawatu Botanical Society

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IN MEMORIAM

■ Celebration of the life and achievements of Geoff Baylis, FRSNZ, 27 March 2004

A large contingent of family, friends and colleagues gathered in the Hutton Theatre at Otago Museum on Saturday 27 March 2004 to celebrate the life of Geoffrey Thomas Sandford Baylis (24 November 1913 – 31 December 2003). Surrounded by displays of various aspects of Geoff's life and work – and garlands of native plants – those present heard twenty speakers recount a particular aspect of Geoff's achievements. Those relating to botany have been summarised into the series of 10 articles that follow.

■ Obituaries (summarised by Anthony Wright)

Geoff's early days in Auckland

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Geoff and the Botany Department: The long haul

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Geoff and his research students
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Fiordland National Park and Secretary Island ventures
Geoff and the Hellaby Indigenous Grasslands Research Trust
Geoff and the Botanical Society of Otago

■ Geoff's early days in Auckland

E J Godley, Research Associate, Landcare Research, P O Box 69, Lincoln

Nowadays, all that land north of Milford on Auckland's North Shore is a major part of North Shore City with thousands and thousands of houses. But when the Baylises settled at Campbell's Bay in 1920 a good deal of the area was dominated by what Cockayne called "gumlands heath". The main plants were tea-tree, kumerahou, introduced hakea, sedges, bracken, and wonderful terrestrial orchids. All grew on a yellow clay, sticky in winter, hard-baked in summer; and over the next 20 years Geoff was to become very familiar with this association, perhaps more familiar than with any he came to know from the Three Kings to Fiordland.

The Baylises had come to Campbell's Bay after living at Palmerston North (where Geoff was born on 24 November 1913), followed by a brief period in Auckland (where Geoff attended Remuera Primary School) (1).

But there was no school at Campbell's Bay and Geoff has recalled that he and his sister Geraldine "had to travel two hours by foot and steam tram each way to Takapuna Primary daily" (2). This would mean walking from Campbell's Bay to Milford and back. This tough life was relieved in 1926, when a new school opened at Campbell's Bay, with 5 pupils on the first day. Geoff and his father had helped clear the land for the new school during Saturday morning working bees (2).

Up until this time girls and boys on Auckland's North Shore had to cross the harbour to attend secondary school. Those from Devonport and Takapuna took the ferry to Auckland Grammar School or Auckland Girls' Grammar, while those from further west – Northcote and Birkenhead – went across to Mount Albert Grammar or Auckland Girls'. But for Geraldine and Geoff to attend these schools from Campbell's Bay was impossible unless they boarded in town. Providence, however, stepped in just as they had finished primary school. A new secondary school was built halfway between Devonport and Takapuna. Furthermore, because the population wasn't all that large, it was co-educational, unlike the other Auckland secondary schools. So in 1927 brother and sister became foundation pupils once more, this time at Takapuna Grammar.

Getting to school was still a problem. At first it would have been as before (the steam tram ran past the grammar school on its way to the Bayswater ferry). But later a bus service was introduced from Brown's Bay through Campbell's Bay to Bayswater, which dropped them off about 10 minutes after school had started and which passed the school just before school ended.

The science subjects at boys' grammar schools were chemistry and physics, and those at girls' schools were botany, general science, and home-science. But at Takapuna Grammar School, which was co-educational and not very large, physics was dropped. The girls did their usual subjects, but the boys did botany and chemistry, the former preceded by two years of elementary physical science.

Geoff was pre-adapted, both by nature and by nurture for these two subjects, chemistry and botany. His father had been an officer in the Department of Agriculture, and his uncle (his mother's brother) was Bernard Cracroft Aston, who was not only the Government Analyst, but a distinguished amateur botanist and horticulturist. He was one of the 20 original Fellows of the New Zealand Institute (now The Royal Society of New Zealand) and was its President in 1926-27.

Botany began in the 5th form for Matriculation, and continued into the 6th form for Bursary and Scholarship. The building was new and contained a special teaching laboratory for botany: plenty of bench space for living material and sketch books, and plenty of shelves round the walls for pickled material and for small boxes with transparent lids for dry specimens such as fruits and seeds. All this was presided over by a remarkable teacher, a small plump part-Maori lady, Miss Olga Livia Gertrude Adams, who had an M.Sc. in botany with a thesis on the gumlands. I think that her secret was to be completely relaxed and to put as much living material in front of us as she could. I had the privilege of being taught by her 6 years after Geoff.

Geoff had 2 years in the sixth form at Takapuna Grammar (1930 and 1931) and was dux in both years. In his second year he won a University Entrance Scholarship, which took him to Auckland University College where he studied Botany under Mr T L Lancaster and graduated BSc in 1934 with a Senior Scholarship in Botany.

But in February 1934, at the beginning of his last BSc year, there occurred one of the most formative experiences in his life. His mother shouted him a trip on the Auckland Museum's expedition to the Three Kings Island on the auxiliary ketch *Will Watch*, which included a day ashore at Parengarenga. Fellow students on board were Charles Fleming and Graham Turbott, as well as established figures such as W R B Oliver, R A Falla, A W B Powell and J A Bartrum.

And so began Geoff's life-long love of those islands and of the far north. As soon as the 1934 examinations were over he and Laurie Millener, a fellow student and a year younger, set off for Kerikeri in the Bay of Islands, on the Northern Steamship Company's *Tuhoe*. From here they biked to Spirits Bay, where they camped, and walked east to North Cape and west to Cape Maria van Diemen. More details of this quite arduous expedition can be found in the obituary notice for Laurie Millener (3).

In 1935 Geoff studied for his MSc writing a thesis entitled "Some observations on *Avicennia officinalis* Linn. (the mangrove) in New Zealand." Then, after the 1935 exams he and Laurie Millener camped on Hen Island of the Hen and Chickens group off Whangarei.

Excellent M.Sc. results gained Geoff a University post-graduate scholarship in Science and in August 1936, he sailed on the *Strathaird* of the P & O line to study for a doctorate in plant pathology at Imperial College, London under Professor W Brown. He shared a cabin with Ian Coop, later Professor of Animal Husbandry at Lincoln College, who was on his way back to Oxford with an 1851 Exhibition Science Scholarship.

Professor Coop tells me that the P & O line offered free passages to needy students – a gesture towards imperial co-operation – but with the curious rider that they must go first class. This meant that Geoff and Ian had to dress for dinner in dinner jackets, stiff shirts and bow ties.

When Geoff returned to Auckland in late 1938, Charles Fleming invited him and Laurie Millener to dinner at his parents' home; and he kindly asked me along too. I was just finishing my second year at University at that time, but I had become good friends with Laurie and Charles through Field Club.

Needless to say there was little chance of getting to know Geoff on this occasion. All that I recall is that Charles showed some slides after dinner (probably of joint trips up north) and that there was talk of the new use of colour photography in the National Geographic magazine. Nevertheless, when Geoff's paper on the leaf anatomy of the mangrove (part of his MSc thesis) appeared in 1940 it had added significance for me in that I had met the author.

I was not to meet Geoff again for another 11 years. In 1950, when on the staff at the University of Auckland, I went down to Dunedin for a fenestration operation to alleviate deafness. And while in hospital, and during several weeks waiting to see if a microscopic skin graft had taken, I first experienced Geoff's kindness, thoughtfulness and hospitality. As so it continued for 50 years, making visits to Dunedin something to look forward to and something to remember with pleasure.

In conclusion, I would say that although Dunedin and its University will list Geoff Baylis among its distinguished sons, and rightly so, to me he was always an expatriate Northerner. He was born and bred there, and returned there regularly, he did significant research there, and he went back there to die.

His death diminishes all our lives, but he will be remembered in the hearts of his many friends and students, and after that by all those who study his distinguished contributions to New Zealand botany.

(1) G T S Baylis's CV; (2) Foundation pupil regales tales of school's first days. Tuesday, June 27, 2000. *North Shore Times Advertiser*; (3) E J Godley & A D Thomson (2000): Laurie Henry Millener. *Auckland Botanical Society Journal* 55 (1): 24-28

■ **Geoff and the Botany Department: The early days**

Margaret Cookson, 60 Bryndwr Road, Christchurch

It's a privilege to be able to make a contribution to this special day for Geoff. The events I've been asked to recall are some 60-70 years ago, so I hope my memories of that time are better than my memory of what happened yesterday!

What was the Botany Department like when Geoff came? It was small, small in space, small in student numbers, but not small in quality. When I started in 1938 there were 12 students – one doing Honours, 4 doing Stage II and III and 7 of us in Stage I. There was one lab shared by all at the back of the Museum building. Dr J E Holloway was the Lecturer-in-charge. He was an eminent scientist, one of only 4 New Zealand-born fellows of the Royal Society at that time. Ella Campbell was the Assistant Lecturer until she left for Massey University at the end of 1944.

At that time Betty Batham and I, both recent graduates in Botany, were on the research staff of the Medical School. Dr Holloway retired suddenly due to ill health, leaving the Botany Department without any staff. When Betty heard this, she came to see me and we immediately went over to Dr H. We found him, drawing pins in one hand and a piece of paper in the other, about to post the notice that there would be no classes in botany in 1945. A break in studies for students wishing to start or advance in botany could have had serious repercussions for their careers – one I can mention by name was Peter Brook, who went on to have an outstanding career in Botany as well as becoming a real friend of Geoff's.

Out of a long discussion with Dr H came a plan to keep the Department going. Betty and I would deliver the lectures to senior classes (Stages II and III) using Dr H's notes as a guide. Brenda Slade, later Shore, came to the rescue by taking all the Stage I lectures and pracs, and also putting out the material for the senior class pracs. Also on the spot all the time and unofficially in the team was Ann Wylie who was completing her honours thesis.

In the August holidays the war was over. Geoff was released from the Navy and arrived in Dunedin to take over the Department. Betty left shortly afterwards to take up her scholarship at Cambridge. Geoff was dismayed at having to plunge into everything at once. Imagine it – lectures, exams to set, administration – the lot. He said that his Botany was all rusted up by salt water after his years in the Navy. So he asked me to stay on and do two lectures a week. Brenda was there too, and Ann completed her thesis very successfully.

The four of us were a good team, but with Betty's departure and later when I left for Canterbury University College and to live in Christchurch the group broke up. It was at least 16 years before we were all in the country at the same time again. We celebrated with a weekend at Portobello where Betty was in charge and the reunion capped off when Geoff invited us to one of his special lunches.

■ **Geoff and the Botany Department: The long haul**

Ann Wylie, Dunedin

My brief is to summarise the development of the Otago Botany Department during Geoff's long tenure as its head. The number of established academic posts tripled from the initial two in 1945 to, by the early 1960's, six. Geoff's first priority was to strengthen the teaching of plant physiology, with the appointment in 1948 of Martin Holdsworth (Imperial College, London), and then, when Martin went to Ghana in 1953, of Peter Harris (Manchester). When Peter returned to the UK, Geoff secured Martin's reappointment in 1959. The fourth staff appointment, of George Scott (Glasgow and Bangor) in 1960, made it possible for Geoff to transfer some more of his enormous teaching load, this time of bryophytes and algae. George revelled in the research opportunities provided by the, to British eyes, unbelievably rich bryophyte flora of southern New Zealand. Coverage of cytology and genetics came with my appointment at the end of 1961. Alan Mark's appointment, subsequent to his Hellaby fellowship, greatly strengthened the ecological expertise of the department. Geoff had recognised from the outset that Otago's easy access to an unrivalled range of habitats favoured focussing our research efforts on ecology.

Some visitors to the department made notable contributions to specialist teaching, for example on seaweeds by Margaret Naylor (late 1940's) and Elsie Conway (early 1970's). Geoff arranged a short term appointment for Elsie (who had just retired from Glasgow), and a fruitful collaboration with Nancy

Adams (Dominion Museum) on the red algae developed. Geoff's famous hospitality to departmental visitors was especially demonstrated in Elsie's case, for he vacated his own flat in "Threave" for her, while he moved down to his George Street house for the duration. Other visitors spent periods of sabbatical leave in the department, including the plant geographer Pierre Dansereau (Canada) in 1949 and again in the late 1950's, and Rudy Schuster, a well-known bryologist from Massachusetts who was here in 1961-2 and for several return visits.

Technical staff also expanded, from nil in 1945. Gill Hamel was the first graduate technician (1953-59) and also doubled as a temporary assistant lecturer as required. Peter Smith was able to pursue part-time BSc study alongside technician duties (a long-established practice in OU science departments). Doug McArthur's long tenure as workshop technician should also be recorded.

Degree structures underwent major changes in the early 1960's, with the breakup of the old University of New Zealand into its constituent colleges. Up till then, the three-year ordinary BSc was followed for those students proceeding further by the Honours, MSc and then PhD. Despite the generally small numbers of Botany students, there were always several research students being supervised by Geoff at MSc level, while Peter Brook and 'Mac' Morrison did their PhD's under him. Other students went overseas for their PhD study, including Brenda Slade and later Peter Wardle to Cambridge (UK) and Alan Mark (to Duke University, USA). In the early 1960's, the four-year Honours BSc degree was instituted, and potential research students could now proceed directly to their PhD's. A steady flow did so, principally in Geoff's own field and in ecology.

The department expanded on the Museum site. The first new glasshouse was built in 1950-51, with more subsequently. The garden area (including experimental plots) grew substantially, and required eternal vigilance on Geoff's part to ward off the invasions of other departments! When the Museum's Centennial Wing was built in the late '50's/early 60's, Geoff was able (thanks to being on the Museum Trust Board) to add much-needed space for research students by getting what was originally to have been unused space at ground level added on to the department's existing large lab. Geoff was also a prime mover (via his membership of the Otago Branch of the Royal Society of New Zealand's Council) in getting the Hutton Theatre built as part of the Museum development – i.e. the original theatre, which was demolished during a subsequent phase of Museum enlargement. It was an excellent lecturing space and served us and other University departments well for many years.

When the Zoology Department vacated its quarters in the Museum, the Botany Department inherited much of the Hocken basement. Conversion of this space for our use took a protracted period, but in the end the department had decent staff rooms for the first time in its history, plus herbarium and library space, a microscopy and dark room area, and a variety of windowless rooms which made good little labs for Martin's developmental physiology practicals. The rickety old ex-Normal School building was still used for the Honours students. The space beneath this was developed as the commodious workshop, plus analytical laboratory.

Despite its rabbit warren features, the department was a very happy place to work in, greatly enhanced by its garden surrounds. Our students clearly appreciated its contrast to the multi-storey concrete boxes occupied by most science departments.

■ **Geoff and the Botany Department: Changing of the guard**

Peter Bannister, Department of Botany, University of Otago, P O Box 56, Dunedin

This contribution, originally presented in heavily illustrated power point format, deals with aspects of what happened in the Botany Department after Geoff's retirement, focussing mostly on those who were present in the 'Baylis era' but continued into the 'Bannister era'.

Martin Holdsworth, who taught and researched physiology, retired in 1979. Paula Jameson and, later, David Burritt, filled the plant physiological niche.

Brenda Shore, who taught and researched plant morphology and anatomy, retired in 1982. Brenda was also a gifted amateur artist. Plant morphology and anatomy are now taught by David Orlovich in our first year Botany course. David has conducted research on floral development in the Myrtaceae.

Paula Jameson (plant physiology) and Murray Brown (marine botany) were the first of the new blood, joining the staff in 1983. In the same year, Dorothy Mills retired as Departmental Secretary. Since

1986, Trish Fleming has continued our line of marvellous and absolutely indispensable Departmental Secretaries.

Ann Wylie, appointed as a Genetics Lecturer but housed in Botany, retired in 1987. With Russell Poulter she developed courses in genetics – precursors to the thriving genetics course that exists today. Janice Lord, David Burritt and David Orlovich from Botany contribute to the genetics programme.

Alan Mark “retired” in 1997, but he’s still the first to get to the top of the mountain! Alan is renowned for his contribution to New Zealand plant ecology and nature conservation at both the local and international levels. Kath Dickinson was appointed as his successor. Bastow Wilson is internationally renowned for his work on community ecology.

Retirements (since 1978)

1978 Geoff Baylis
1979 Martin Holdsworth
1982 Brenda Shore
1987 Ann Wylie
1993 Paula Jameson
1994 Murray Brown
1997 Alan Mark

Arrivals (since 1979)

1979 Peter Bannister
1983 Paula Jameson
1983 Murray Brown
1992 Paul Guy
1994 David Burritt
1995 Catriona Hurd
1996 Janice Lord
1997 Kath Dickinson
1999 David Orlovich

Longest serving staff member: Bastow Wilson (since 1972).

Geoff Baylis laid the foundation on which the current Botany Department is based. His example as an encouraging, kind, gentle but effective, leader is one that we cherish and strive to emulate. We like to think that he would be pleased to know that (thanks to David Orlovich and Paul Guy), mycorrhizal and fungal studies are having something of a Renaissance in the Department.

▪ **Geoff and his research students**

Karen Cooper, 1259 Howard Street, Hastings

I have been asked to talk of Geoff and his research students. But before I do that I'd like to shed light on some of his qualities by asking you to think about Sherlock Holmes. You might wonder what Sherlock Homes has to do with Geoff. Both were: highly intelligent and astute; analytical and logical with excellent powers of reasoning; adaptable to the changing times, although if Geoff had still been in office, he would likely have been stumped by the current climate of politically correct madness which assails us; and both were practical, down to earth, often cryptic, and certainly not afraid to call a spade a spade.

Geoff was a man of many talents. Professionally, most people knew him as an academic and professor, greatly admired and respected by peers and students alike, and who inspired generations of botanists with his knowledge of plants, ecosystems and fungi; a botanist and plantsman extraordinaire; and as a pioneer in mycorrhizal research and a world leader in this area for over 30 years. As a teacher and research leader, he was an inspirational role model with a passion and infectious enthusiasm for his subject matter and a genuine interest in his students.

Geoff had 3 crops of research students. The first, in the early days of Geoff's arrival in the Botany Department included Peter Brook, Mac Morrison and later Margaret Loutit. He also supervised a number of MSc students including Peter Wardle, Alan Mark and Brenda Slade. These all contributed greatly to the research output of the Department and were high achievers, academically and professionally, including Peter Brook as Director of Plant Diseases Division, DSIR in Auckland, Mac as a Professor of Plant Sciences at Lincoln University, and Margaret as Professor of Microbiology at Otago.

In the 1960's, when Geoff's research was in its infancy, Ross McNabb's MSc work, surveying the mycorrhizal status of native plants, greatly assisted in defining the parameters for future mycorrhizal studies. In the 1970's and recognised by now as a pioneer and world leader in mycorrhizal research, Geoff “fathered” 5 PhD students. In fact, he often referred to this time as his “vintage years”. They were Ian Hall (Mycorrhizal dependency of Rata and Kamahi), Jim Crush (Mycorrhiza in the native

grasses), Peter Johnson (Infection and shade effects in native plants), Karen Cooper (New Zealand native ferns), and Conway Powell (Mycorrhiza in rushes and sedges). Conway found that these plants had no mycorrhizal association. But far from abandoning this line of enquiry, Geoff applauded it, emphasising that negative results are just as important as positive ones.

In his autobiography 'Founded on Fact', Geoff modestly stated that this "quintet made excellent progress with very little guidance from me". The reality was actually somewhat different. Geoff certainly didn't breathe down our necks every day (he had appreciated that freedom from his own PhD supervisor). However, he provided plenty of support and guidance, while still recognising that his students took great pride in the area of knowledge they were developing and were quite capable of working various other networks and contacts to acquire additional information and assistance if required.

Geoff had a voracious appetite for knowledge and an enquiring mind. In a subtle, but supportive way, he challenged his students to seek answers, to look for the "not so obvious", and to think laterally.

Geoff was always conscious of crispness in communication, with both the written and spoken work. His succinct turn of phrase, quick wit and mastery of repartee meant he had an enviable ability to impart maximum information with meaningful brevity and punch. It is worth noting that Geoff would never co-author papers published by his students, preferring instead to give full credit to the students.

In reality, Geoff taught much more than facts and ideas, and imparted much more than botanical knowledge. From him we learnt professional values and integrity; to have a passion for what you do; to strive for excellence; and to go that extra mile and have the tenacity to overcome problems and win through in the end. These are skills not confined to Botany – they are skills essential to any working environment, and indeed to life. They are the values by which Geoff lived his full and rewarding life.

I am sure all his students count themselves fortunate to have had Geoff as a mentor, teacher and colleague.

■ **Geoff and the Three Kings Islands**

Anthony Wright, Canterbury Museum, Rolleston Avenue, Christchurch 8001

Thank you for the opportunity to speak about Geoff and the Three Kings – really to do honour to the Father of Three Kings botany, because that is what Geoff Baylis will, amongst other things, always remain.

By my reckoning, Geoff made 13 trips to the Kings over a period of 50 years. His first, in 1934 was by boat – the *Will Watch*. Barring one early helicopter trip in 1972, all his visits were made by sea in a variety of craft, from small yachts, on government steamers, to a fishing boat, a dive boat and even courtesy of the Royal New Zealand Navy.

I first came into contact with Geoff in the early 1980s when, as the newly appointed Botanist at Auckland Museum, he contacted me to see if I was interested in "taking over the mantle" of the Three Kings botany. Was I ever! As a keen member of the Auckland University Field Club and then the Offshore Islands Research Group, I'd already been to a couple of hundred northern offshore islands, but not the Three Kings, which remained the 'jewel in the crown' as far as I was concerned.

With typically wry modesty, Geoff declared that he had "retired from all serious effort" and was ready to hand over. As subsequent events showed, his energy, interest and determination "post serious effort" remained formidable – he certainly gave all of us younger chaps a real run for our money.

Geoff expounded two great themes in Three Kings botany – first, the dynamic vegetation regeneration, and second, the extraordinary assemblage of rare and endemic plant species. Both these themes informed and underpinned the practical, common sense, minimal interference conservation and protection ethic that Geoff championed for the islands and their flora and fauna.

Before looking at these two great themes, let's have a quick introduction to the Three Kings Islands themselves. They lie about 60 km off Cape Reinga and are one of the outstanding Nature Reserves in New Zealand. Their isolation from the mainland for at least 2 million years has seen the evolution of a variety of plants and animals found nowhere else. Their history of human modification, by both Maori and European, is considerable and has had far-reaching effects on the flora and fauna.

The Three Kings are spread out over nearly 15 kms of open ocean. The group consists of one large island – Great Island; 3 smaller islands – West, South West and North East, and the Princes Islands, a cluster of rugged rock stacks.

Now to Geoff's first great theme – that the Three Kings provide an exceptionally favourable opportunity for studying plant dispersal and succession. In the late 1940s, Geoff Baylis began the detailed documentation of the vegetation and flora which resulted in numerous papers which provide the bulk of the available information on the islands' plants. But first, a little history.

In 1889, four goats had been released on Great Island to provide food for castaways. By 1929, the goat population was estimated at 300. Following the 1945 expedition, which included Geoff, urgent representations were made to Government, and in 1946 professional hunters were sent to the island to exterminate the goats. The entire population – numbering 393 – was destroyed, and Graham Turbott, who accompanied the hunters, established three permanent vegetation quadrats to allow the plant regeneration to be monitored. In his paper describing the establishment of the quadrats (1) Graham included a section on "Regeneration observed during the (three week) expedition" which gave a taste of the dynamic regrowth to come.

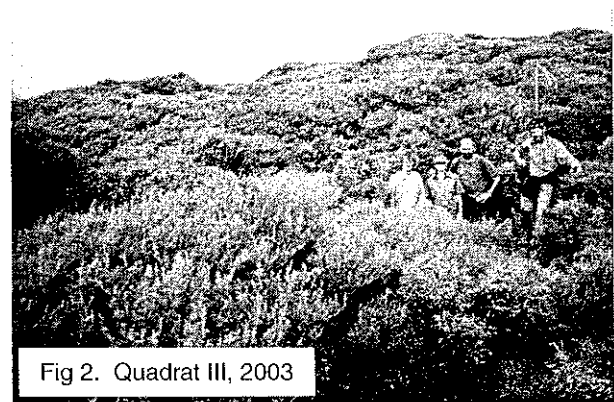
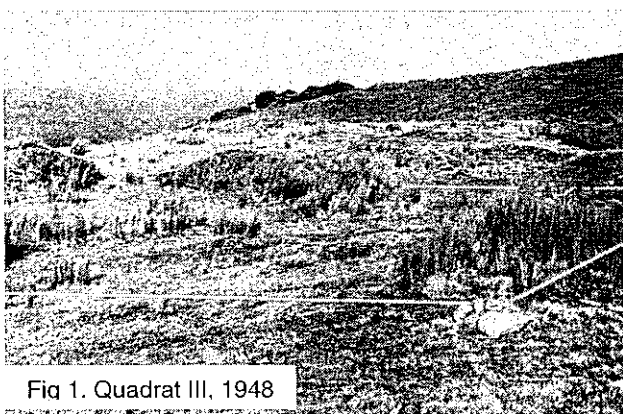
In 1946, one of the quadrats, Quadrat III, was a 30 x 30 metre patch of closely-cropped *Zoysia* (a native grass) turf with the odd clump of the sedge *Isolepis nodosa*. By 1951, in the absence of goats, *Zoysia* was still present, but had been overtopped by a sward of mixed grasses. Young kanuka occupied nearly 25% of the quadrat.

By 1963, the original dominant, *Zoysia*, had completely disappeared; species diversity had halved, and kanuka occupied 80% of the plot.

In 1982 when Geoff and I re-measured the quadrat, kanuka was up to 95% cover, with another shrub species *Coprosma rhamnoides* having made it's entrance. The tallest kanuka were now over two metres high.

By 2003, we had real trouble finding the two metre high quadrat markers, such was the growth. The density of the shrubbery made re-measurement a frustrating task!

To recap, let's look at a different angle – towards the mouth of the Tasman Stream. Here we are (Fig. 1) in 1948, and then add 55 years of regeneration to 2003 (Fig. 2). The tallest kanuka are now over four metres high – you can walk under them. But even more telling – in 2003 we found the first seedling in the quadrat of a tree species not even present on the island in 1946 – puka or *Meryta sinclairii*.



Puka is an excellent cue into Geoff's other Three King's passion – the flora, and particularly the rare and endemic plant species.

He elegantly explained the reintroduction of puka to Great Island (2), and witnessed it's almost explosive recolonisation of areas with better soils. He also charted the fight back from near extinction of the Three Kings titoki (*Alectryon grandis*) and *Myrsine oliveri*. Other striking endemics include Three Kings kawakawa *Macropiper melchior*, puka, Three Kings rangiora (*Brachyglottis arborescens*), the fern *Davallia tasmanii* and the stunning scarlet-fruited *Elingamita johnsoni*. In 1983, we discovered a major new population of the latter on Hinemoa Rock in the Princes Islets.

This leaves the two rarest endemics – found by Geoff as single plants. *Tecomanthe speciosa* is a robust liane, now common in cultivation. It's only been seen flowering once in the wild in 1945, but has layered and spread vegetatively.

The other – a single tree – was found half way down the steep coastal forest on the northern side of Great Island. Here's *Pennantia baylisiana* in 1946 (Fig. 3) – just look at the devastation caused by goats. And here it is (Fig. 4) with it's discover looking on 40 years later – really healthy, and with the first ripe fruit seen in situ.



Fig 3. *Pennantia baylisiana*, 1946

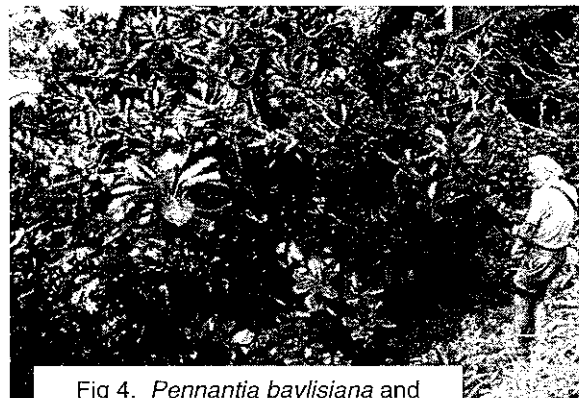


Fig 4. *Pennantia baylisiana* and Geoff Baylis, 1982

In the last year of his life, Ewen Cameron and I twice brought Geoff back water from Tasman Stream – in an emptied tonic bottle symbolising one half of the GnT's he produced before dinner on our first night there in 1982 – a superb field tradition! Geoff said it was the sweetest water he knew.

Geoff Baylis loved these islands and passed on his passion for protecting them and the fascinating stories they have told and will continue to tell. You can feel his spirit there still, particularly in the tranquil valley containing Baylis Stream with its ethereal tree ferns.

(1) E G Turbott 1948: Effect of goats on Great Island, Three Kings, with descriptions of Vegetation Quadrats. *Record of the Auckland Institute & Museum* 3 (4 & 5): 253-272; (2) G T S Baylis 1986: Widened seed dispersal at the Three Kings Islands attributed to naturalised birds. *In: The offshore islands of northern New Zealand. New Zealand Department of Lands & Survey Information Series* No. 16: 41-45.

▪ Lichens, London, and Music – some personal remembrances of Geoff Baylis

David J. Galloway, 16 Farquharson Street, Opoho, Dunedin

My first contact with Geoff Baylis was in April 1960, when he bounced into the old Biology Lecture Theatre in the back of the Museum that Botany shared with Zoology. I was in Stage I Botany, a small class, with the front two rows eagerly taken up by chatting girls, with the men sitting up in the shadows of the back rows. Geoff gave us a few lectures on Lower Plants and even mentioned lichens briefly, telling us that “correctly they ought I suppose, be referred to as Mycophycophyta”, a term I'd not heard previously. Even in the coldest weather Geoff lectured in a spotless white labcoat with the sleeves rolled up.

A little over a year later, in June 1961, Dr James Murray (1923-1961), lecturer in Organic Chemistry in the Dept of Chemistry, was tragically killed in an accident on the Taieri, a few days after having taken delivery of a new Wolseley car from Britain where he'd been on sabbatical leave at Imperial College and the British Museum (Natural History) (BM) in South Kensington. At Jas Murray's crowded funeral, Geoff was one of the pallbearers, along with the then Vice Chancellor, Frederick Soper, and fellow Chemists, Hugh Parton and Ted Corbett. It was a sombre moment and one the Otago botanists felt deeply.

In 1962 Ted Corbett, Prof of Chemistry and Hon Sec of the Nuffield Foundation in New Zealand, arranged for the Nuffield Foundation to support a lichenologist, Peter James, from the BM for a 4-month visit to New Zealand to curate the Murray lichen Herbarium, and also take part in a biological

expedition to the Auckland Islands in January 1963, organized by the Royal Society. Jas had worked with Peter at the BM in 1960, so he was the best person for the job. Geoff Baylis offered the Botany Department student labs as a suitable workspace for Peter James and the lichens were duly moved from their inaccessible cupboard in the Chemistry Dept, across to Botany. I met George Scott in the University quadrangle, outside the old Library, in November after exams were finished. He told me that Peter James's arrival was imminent, and would I be interested in working with him as a technician, as there was a rather daunting pile of lichen-filled boxes to contend with, and he was sure that he could persuade "the Prof" to give me a summer job, to help the lichen project along. That summer job was a great turning point in my life in several distinct ways: it gave me the idea of lichens as a possible career; it introduced me to the varied and at times extraordinary, close-knit family that was the Department of Botany; and it was the start of a friendship with Geoff Baylis and his support of my interest in New Zealand lichens.

Geoff was a regular and enthusiastic support of the National Orchestra as it then was, of the Chamber Music Society, of local opera productions, and in later years he would even happily come along to organ recitals at the Town Hall. I encouraged Geoff to import LPs from EMG Handmade Gramophones in Soho Square (a distinguished botanical address, for earlier tenants of the building had been Sir Joseph Banks and Robert Brown, to whom Banks left the house) and when his selection would arrive he would invite me up to listen to what had come over coffee cakes and liqueurs. Once rather gleefully he put on a very amusing record of Kenneth Williams monologues that had come with more serious fare (Toll the Bell for Minnie Dyer) – and Geoff's favourite, Charley – being about a council dustman who wakes up one day to find that he has succeeded to a title and become a Lord:

Charley, Charley, Charley's one of us!
He lives upstairs in a Council flat and he travels on the bus!
And now his wife's a lady – which she never was before!
Charley, Charley it's you we're shouting for!!

Geoff delighted in the music of the 18th century especially Handel and Mozart. He loved the human voice and in London as a student had often secured a standing pass at Sadlers Wells in the heyday of Joan Cross and Lawrence Collingwood. His favourite opera was *Carmen*, and he was moved beyond measure if the Carmen could really dance. He heard Audrey Mildmay as the Countess in *Figaro*, and on later, less impecunious visits to Britain, he would tog up in dinner dress and travel by train from Victoria down into Sussex, to go to Glyndbourne as it was under its founder John Christie – with picnic hampers and champagne in the gardens between the acts. Geoff liked Beethoven if it wasn't too heavy, but found Brahms "turgid" and most modern music was not greatly to his liking. He very much loved simple folksongs, especially Tom Bowling and very much a haunting song "I know where I'm going".

For me, Geoff, Lichens and London are very much interlinked – together with Eric Godley, it was Geoff who supported my application for a Royal Society Commonwealth Scholarship that released me from Biochemistry to start a proper study of NZ lichens at the British Museum. Geoff wrote "Congratulations on your Royal Society award. You could not be going to London under more distinguished patronage. I hope all the important things will delight you there. Remember that spring does not come until May".

He liked Piccadilly and its famous shops such as Fortnum and Mason's and Simpsons. Once, while buying a pair of expensive shoes at Simpsons, the formerly rather oleaginous salesman enquired whether "Sir might be from South Africa?" "From NZ actually" replied Geoff. "Ah!" said the salesman, "then Sir has purchased a *bloody good* pair of shoes!"

There is a great deal more that I could say, but I won't, for I am reminded of a visit, not so long ago, with Geoff to a Friends of Otago Museum function, when an earnest guide lectured us in great detail. Geoff and I were lagging behind at the rear when Geoff, who was quite hungry by this time and looking forward to a dinner afterwards, said in a not inaudible whisper ... "The hardest thing in the world is to speak engagingly for a short time – this young man does not possess that gift!"

■ **Fiordland National Park and Secretary Island ventures**

Peter Wardle, Research Associate, Landcare Research, P O Box 69, Lincoln

Geoff's first impressions of Secretary Island were gained during a voyage from Milford Sound to Dunedin on the *A/ert*, as described in his autobiography 'Founded on Fact'. Subsequently it

comprised a large part of his Fiordland involvement. Prior to his visits, all but one of the place names on the maps were coastal, whereas today's maps show six inland names that Geoff had proposed. On field trips he was regularly accompanied by Alan Mark and I, with other participants being Jas Murray (lichenologist), Ross McQueen (mycologist), George Scott (bryologist) and Larry Bliss (an American ecologist). In 1959 and 1967 we reached the island by launch across Lake Manapouri, by track or road over Wilmot Pass, and then by another launch trip down Doubtful Sound, whereas in 1960 and 1964 we arrived by float plane.

During successive visits we set up base camps at Blanket Bay at the eastern end of the island (twice), at Astelia Stream in the north-east, and at Grono Bay on the south coast. We ascended from these camps to describe the vegetation from sea level to the scrub and tussock-covered tops, the latter involving camping out above bush line. From a saddle above Blanket Bay we also descended to the west coast of the island. We saw our first evidence of deer in 1964, in the form of ring-barked three-finger trees at Grono Bay, but when Geoff and Alan visited in 1975 deer damage had reached the tops.

In 1963 our papers about Secretary Island filled 76 pages of the *New Zealand Journal of Botany*, and were followed by another paper in 1970; but by now Geoff was turning our attention to different parts of Fiordland. Geoff, Alan, George Scott and David Galloway flew to the Barrier Flats in the Olivine Range in December 1969; but as the plane crash-landed on the first flight in, the exercise had to be completed by helicopter.

In 1972 we went by helicopter to West Cape, together with Andrew Campbell from Botany Division and Alan Cragg from Fiordland National Park. Supplies had been brought offshore by fishing boat, and then by helicopter to our camp on the edge of the coastal peneplain, which is covered by prickly snow tussock, scrub and shallow bog. A first impression that this country would provide easy travel was deceptive, because of deeply incised valleys and belts of dense scrub. After we finished on the peneplain and coast, we followed the Frazer River to Lake Frazer and from here walked to the tops, to be overwhelmed by the precipitous drop to Dusky Sound from the rolling, partly open country behind us.

In 1974, Geoff, Alan Mark, Alan Cragg and I went by helicopter to Poison Bay. On a day too wet for field work, Geoff had us composing a letter urging the Forest Service to make greater efforts to prevent deer reaching places such as Secretary Island. After flying back to Milford Sound, we made trips into dank forests in Sinbad Gully and the Tutuko River, and later learned that these were the last toeholds of kakapo in Fiordland.

In all these trips, Geoff provided the best kind of leadership by leaving the other scientists to determine the research programmes, but he enthusiastically helped in the field and in the writing up, did far more than his share of camp duties, and was so quietly stoic that younger people wouldn't dare to throw in the sponge during inclement weather.

Botanical trips were only one aspect of Geoff's Fiordland involvement. For instance, he climbed Mt Soaker, the highest and least accessible summit in southern Fiordland, with Alan and Margaret Cookson and Peter Brook. From 1952 he was a foundation member of the Fiordland Park Board, and his membership covered the period when the Manapouri power scheme was thrust upon the Park. Geoff would have been the strongest voice persuading the Board to change emphasis from development to nature conservation, and would have argued uncompromisingly that deer and wapiti are incompatible with the prime purpose of the park, which is to protect the native flora and fauna.

■ **Geoff and the Hellaby Indigenous Grasslands Research Trust**

Alan Mark, Department of Botany, University of Otago, P O Box 56, Dunedin

The Hellaby Trust was established in 1959 by Miss Eleanor Lilywhite Hellaby of Auckland to promote and fund student research into the ecology and sustainable management of New Zealand's indigenous grasses and grasslands.

A family member of the successful meat processing and exporting company R & W Hellaby, Miss Hellaby originally was of a mind to support an animal welfare home in Auckland. Discussions with her influential brother Arthur, however, and he in turn with a close friend in Auckland's Northern Club, Gordon Cunningham, persuaded Miss Hellaby to devote her substantial funds to supporting research into New Zealand's indigenous grasslands. These grasslands, at the time, were the cinderella of

several government research departments and the main responsibility of none, unlike our exotic grasslands. At the time, assistance to the farming community was considered to come largely through the extension work of relevant government departments. The lack of significant direct government-funded research into New Zealand's indigenous grasslands was largely in relation to the perceived lack of a financial return from any such investment. This was despite widespread concern with the continuing degradation of our indigenous grasslands under pastoral farming.

The idea of money from the land being re-invested in the land obviously made a strong appeal to Arthur and Eleanor Hellaby, along with the added value of keeping good young scientists in New Zealand.

Gordon Cunningham, who was raised in Central Otago and was Director of DSIR's Plant Diseases Division at the time, was appointed as the first Chair of the Trust's Board of Governors in 1959. He had persuaded his colleague in the Otago University's Botany Department, Geoff Baylis, to join him as one of the three founding Governors, to oversee the operation of the Trust, along with Miss Hellaby's lawyer, the Honourable Mr Justice Haggitt. Arthur Hellaby became a Trustee, along with the manager of the NZ Insurance Company's Trust Department, which handled the Trust's finances. So Geoff Baylis was not only a foundation Governor of the Hellaby Trust in 1959, but was also its longest serving member, by far. He played a pivotal role over the 42 years he served as a Governor of the Trust, the last 33 years as its Chair. Other distinguished governors included Dr Leonard Wild, Chair of the University Grants Committee and Sir Malcolm Burns, Principal of Lincoln College. There are three of the other four Governors with us to-day, to vouch for my comments on Geoff's key role for the Hellaby Trust. These are Eric Godley, ex Director of DSIR's Botany Division, Professor Reinhart Langer of Lincoln University, and Bill Lee of Landcare Research, Dunedin.

I was the Trust's first Fellow from 1960 until 1965 and had the pleasure of hosting the Hellaby family and Governors to two of my three study sites in Otago in 1963. The visit must have been reassuring for the founder as she subsequently increased the assets of the Trust. The Hellaby family also attended the first of the Trust's triennial seminars in 1966. The operation of the Trust, as had been set up in the early years, was continued under Geoff's leadership, and with the continued support of the Hellaby family. Overall, the turnover of Governors has been very slight over the 45 years that the Trust has been in operation. I continued as the Trust's Research Advisor until I was invited to replace Geoff as Chair of the Board of Governors in 2000. At this time my successor in the Botany Department, Dr Katharine Dickinson, was invited to take over my advisory role for the Trust.

As I said earlier, Geoff's role on the Hellaby Trust, was pivotal in ensuring that it fulfilled the philosophy and intent of the Hellaby family. Well over 200 students, involving all of our seven universities, and several distinguished overseas visitors, have been supported with fellowships from the Trust, over the 45 years of its existence.

I am honoured to have the opportunity on this important occasion to formally record this major contribution, among the many of Geoff Baylis, to New Zealand's present and future welfare and prosperity.

■ **Professor GTS Baylis: a BSO perspective (1999-2003)**

Allison Knight, 28 Embo Street, Dunedin 9015

Others have acknowledged and acclaimed Geoff's early days, when he turned what he said was his 'great advantage in being poor' into determination to win scholarships, when he reluctantly distinguished himself as a submarine-sinking war hero, when he headed with distinction the Botany Department at the University of Otago for over 30 years, and did ground-breaking research on arbuscular mycorrhizal fungi.

My association with Geoff was all too brief, beginning when I joined the newly re-started Botanical Society of Otago (BSO) in 1999. By then he was a little old man with twinkling eyes who would walk down to meetings, with David Galloway if he was in town, and sit near the front, following proceedings with interest. His comments were always pertinent, constructive and informative. Often he would follow these up with a related note for the newsletter, which I appreciated even more when I became editor.

Looking back through old BSO newsletters shows just how active and nurturing Geoff was of botany in Otago in his last 3 years. The January 2000 issue announces him as Patron of the "Friends of the

Otago Herbarium" group (1). Issue 17 contains Geoff's glowing book review of *Edible and Poisonous Mushrooms*, by Ian Hall et al. (2). Newsletter 20 invites members to a guided tour of his wonderful garden, as well as an article on Solanaceae (3). Geoff followed this with an article in praise of *Griselinia* in Number 22 (4) and joined the divarication debate with a poem on divarication for Number 26 (5). By September 2001 there was another invitation to visit his garden, and in August 2002 an article on growing *Ixerba* with *Griselinia* as a mycorrhizal-rich companion plant (6).

No wonder that when Bastow Wilson suggested that BSO institute an annual lecture named in honour of Professor Baylis, while he was still here to appreciate the honour, I was enthusiastic about the idea. Thus it fell upon me the task of approaching Geoff to seek his permission, and then to interview him for the newsletter, if he agreed. The task was not made easier by my then hearing that Geoff had advanced lung cancer, and I approached him with some trepidation, not wanting to seem ghoulish. But Geoff received me courteously, like the gentleman he was. At first he was humbled by our proposition, but as he showed me round the wonderful garden he had created, primarily as a source of fresh material for the Botany Department, he warmed to the idea.

Later, as plans for the inaugural Geoff Baylis Lecture in October 2002 progressed, Geoff's delight at the thought of so many of his widespread botanical 'family' gathering together made it a pleasure to organise such a special occasion. Others thought it special, too – the Marjorie Barclay theatre in the Otago Museum was full to overflowing and the proceedings were recorded on video - a video that Geoff watched several times after he moved back to Auckland to be closer to family.

Besides the annual Geoff Baylis lecture Geoff's legacy lives on in many ways. Botanists up and down the country, and further afield, treasure in their gardens the rare plants that Geoff discovered on the Three Kings Islands and brought back for propagation. My own treasure, from a cutting Geoff gave me, is a perennial *Helichrysum* with vibrant yellow everlasting flowers, now flourishing in my garden.

Geoff would be pleased to see that interest in mycorrhizal fungi, which he pioneered, is alive and well at Otago, with a visiting William Evans Fellow speaking to BSO in February 2004 (7). He would be even more pleased if his tip about growing the indigenous tree he considered had among the most beautiful flowers in New Zealand, tawari (*Ixerba brexiodes*), alongside mycorrhizal-rich broadleaf (*Griselinia littoralis*), was taken up more widely. (6, 8). That would be a most fitting tribute to a most exceptional botanist.

(1) Bannister, J; Lord, J. 2000: Notes from the Otago Herbarium (OTA). *BSO Newsletter 16 (6)*; (2) Baylis, Geoff 2000: *Book Review: Edible and Poisonous Mushrooms*, by Ian Hall, Peter Buchanan, Wang Yun, Anthony Cole. *BSO Newsletter 17 (6)*; (3) Baylis, Geoff 2000: Our Solanaceae. *BSO Newsletter 20*; Baylis, Geoff 2000: It was broadleaf that saw me right – in praise of *Griselinia littoralis*. *BSO Newsletter 22*; (5) Baylis, Geoff 2001: Divaricate or Desiccate – poem by J Turner. *BSO Newsletter 26*; (6) Baylis, Geoff 2002: *Ixerba*. *BSO Newsletter 33*; (7) Hesom-Williams, N. 2004 Report of talk by John Cairney 'Mycorrhizal fungi – ubiquitous underground partners of plants'. *BSO Newsletter 41*; (8) Landis, C. 2003: *Ixerba brexiodes* and Arbuscular Mycorrhizal Fungi. *BSO Newsletter 40 (12)*.

RESEARCH REQUEST

- **Grasses needed to complete counts for the New Zealand Poaceae (nom. altr. Gramineae)**
Brian, G. Murray, School of Biological Sciences, The University of Auckland, Private Bag 92019, Auckland, b.murray@auckland.ac.nz; **Peter J. de Lange**, Science & Research Unit, Department of Conservation, Private Bag 68908, Newton, Auckland, pdelange@doc.govt.nz

As in previous requests (Murray & de Lange 2002, 2003) we are calling for live plants of the following New Zealand grasses (see list) to complete our chromosome survey. Thanks to the earlier collecting efforts of Brian Molloy, Kelvin Lloyd, Graeme Jane, Brian & Chris Rance, Dean Baigent-Mercer, David Norton, Jim Clarkson, Nick Singers, Colin Ogle, Shannel Courtney and the late Tony Druce we have virtually completed the survey. At present there are only 19 taxa still outstanding.

As before, we still want living samples or fresh seed of the taxa listed below. In general grasses are easily dug up and transplanted, and just a few tillers with a small amount of root ball can usually be transplanted. However, because of Auckland's humid climate, and warm, wet, winters many of the southern species will not long persist in cultivation or flower. Therefore we add a further request that

(if at all possible) a flowering/fruitlet specimen suitable for a herbarium voucher should be collected as well, and the live plant and the herbarium sample posted with full collection details to either of us.

We truly appreciate that this is a **big ask**, especially as grass identification can be tricky. But as has been shown by the tremendous support we have already received from the last two requests, people have been very kind in their efforts to help us complete our survey.

Please make sure you have permission to collect before sampling grasses (or indeed any native plant) from the wild.

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- Murray, B.G.; de Lange, P.J. 2003: Grasses need to complete chromosome counts for the New Zealand family Poaceae (nom. altr. Gramineae). *New Zealand Botanical Society Newsletter* 72: 15.

List of grasses needed to complete chromosome counts for the New Zealand indigenous vascular flora (19 taxa).

<i>Agrostis oresbia</i>	<i>P. celsa</i>
<i>A. subulata</i>	<i>P. cookii</i>
<i>Deschampsia pusilla</i>	<i>P. maia</i>
<i>Hierochloa cuprea</i>	<i>P. tonsa</i>
<i>H. recurvata</i>	<i>Puccinellia walkeri</i> subsp. <i>antipoda</i>
<i>Lachnagrostis glabra</i>	<i>P. walkeri</i> subsp. <i>walkeri</i>
<i>L. pilosa</i> subsp. <i>nubifera</i>	<i>Rytidosperma merum</i>
<i>L. tenuis</i>	<i>R. nudum</i>
<i>Lepturus repens</i> var. <i>cinereus</i>	<i>Zotovia accicularis</i>
<i>Poa aucklandica</i> subsp. <i>rakiura</i>	

NOTES AND REPORTS

Research Report

▪ Fruit and seed of *Pennantia baylisiana* (Pennantiaceae)

Rhys O. Gardner, Department of Botany, Auckland War Memorial Museum, Private Bag 92018, Auckland; P. J. de Lange, Department of Conservation, Private Bag 68908, Newton, Auckland & Geoff Davidson, Oratia Native Plant Nursery, 625 West Coast Road, Auckland.

Introduction

Only a single wild individual of *Pennantia baylisiana* has ever been discovered, a tree first seen in 1945, and still extant, on Great Island of the Three Kings Islands group in the New Zealand Botanical Region (Baylis 1977; Wright 1983; Gardner & de Lange 2002). We assess here the reproductive capacity of this unique species (see also Webb 1996). Firstly though a history of the cultivation of the plant in New Zealand is given, partly for its own interest (some details have not been published before), and partly because it seems to be relevant in understanding the plant's sexuality.

Cultivation history

The cultivation of *P. baylisiana* was immediately initiated by its discoverer G. T. S. Baylis, who removed the tree's only sucker shoot and planted it on return to his home in Dunedin, where it eventually rooted (Baylis 1997). At the same time Baylis sent crown branchlets to chief propagator George Smith of Duncan & Davies Ltd at New Plymouth, and to DSIR Plant Diseases Division at Mt Albert, Auckland, but these all failed to root (Baylis 1997). In 1950 then, Baylis, acting on Smith's advice, returned to Great Island and cut one of the four trunks of the wild tree, hoping to promote more basal shoots. He returned the next year to find that his boldness had been rewarded, and sent the new shoots to Smith, who soon had them growing successfully (Baylis 1997; Baylis 2002; Baylis pers. comm.). Eventually *P. baylisiana* became available to New Zealand gardeners from cuttings of these first-generation plants. The majority of this second generation would have originated with specialist growers in the northern part of the country, from about the late-1970s onwards.

Sexuality, Fertility

To the best of our knowledge all older plants on the New Zealand mainland derive from vegetatively-propagated material (mostly from the 1951 introduction cited above, and perhaps from Baylis's Dunedin tree too, and also from material brought in to the University of Auckland in the early 1980s). This is not because branchlet cuttings take root especially readily - they do not (Oates in Baylis 1997) - but because the wild tree has been considered to be entirely female in its functioning (Sleumer 1970). Thus the general belief seems to have been that fruit found on a cultivated *P. baylisiana* individual would either be empty, or, if full, be the result of crossing with other members of the genus (the native *P. corymbosa* or, in at least two garden situations we know of, *P. endlicheri* of Norfolk Island). Nevertheless, despite this belief we point out here that both the wild tree and its cloned offspring can produce viable, non-hybrid seed.

With respect to fruit on the wild tree, Webb & Simpson (2001) state that "as the tree is female, mature endocarps are not formed". But Wright (1983, 1989) had observed that inflorescences a short time after anthesis sometimes had, in addition to numerous matchhead sized persistent ovaries, a few much larger and purplish "mature fruit ... 9-10 x 4-4.5 mm" (Wright 1989). He did not say whether or not these contained embryos and endosperm.

We offer the following indications that fruit with viable, non-hybrid seed can be made. Firstly, there is the evidence from AK 182942, voucher for the above-cited observations of Wright (1989). This bears two more or less full-sized fruit. Both are well-supplied with endosperm, whereas the numerous hardly swollen ovaries on the rest of the inflorescence lack endosperm completely. Because the wild *P. baylisiana* individual is so isolated from other members of the genus (the nearest known *P. corymbosa* we are aware of is located more than 100 km away on the mainland) these fruit must be considered to be non-hybrid.

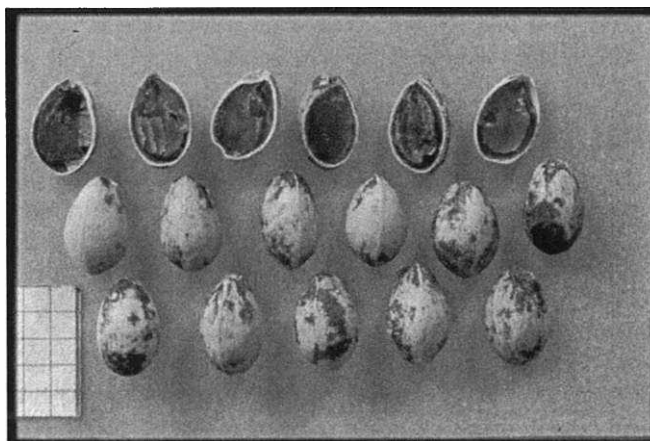
Secondly, there is evidence from the cultivation work begun by R. E. Beever at the Mount Albert Research Centre, Auckland (Mole 1989; Davidson 1999). Viable seed was produced here in the mid-80s by hand-pollination of protected inflorescences of a single isolated tree (planted at MARC in 1970; R. H. Main, pers. comm.). One of the offspring from this procedure, presently in cultivation at the Oratia Native Plant Nursery, has from the early 1990s repeatedly set a considerable amount of seed, without any special manipulation (Davidson 1999). Second-generation offspring of that plant now number in the hundreds at least, and these seedlings have been sold from the above nursery since 1998. As far as we are aware, they too mature within four or five years and (at least in some years) produce abundant fruit.

It would seem that the oldest cloned *P. baylisiana* plants, perhaps because of the nature of their originating material (basal sprouts), had at first very little self-fertility; after several decades in cultivation though a degree of "leakiness" has developed in their predominantly female sexuality, with fruit now being made, presumably by self-pollination. In contrast to these cloned plants, seed-grown plants cultivated in Auckland take only four or five years to become self-fertile, and fruit and seed set is often nearly 100%. The reason for the variation in fruit production in the clonal material, from individual to individual and from year to year, will presumably be clarified when the pollination details etc. become known.

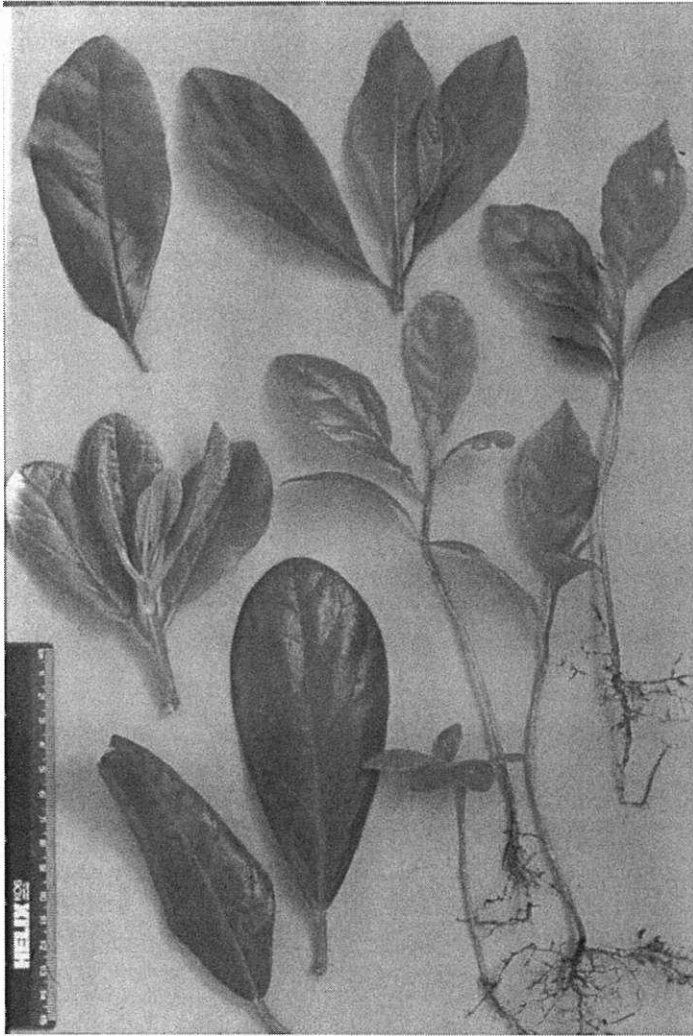
Morphology

Seeds (strictly speaking, endocarps) of a cultivated individual of *P. baylisiana* are shown in Fig. 1; they have the dimensions cited by Wright (1989). Fig. 2 shows seedlings and adult leaves of *P. baylisiana*, and adult foliage of Norfolk Island's *P. endlicheri*, whose crenate character is also seen in the leaves of the *P. baylisiana* seedlings.

Fig. 1 "Seed" (endocarps) of *P. baylisiana* (AK 254408), some sectioned to show endosperm. Scale bar=1 cm.



A description of the *P. baylisiana* seedling is: Germination epigeal; hypocotyl c. 5 cm long; cotyledons



thinly fleshy, broadly obovate, c. 2.3 cm diam., sometimes emarginate; first several true leaves to c. 3 cm long, the next several to c. 12 x 5 cm, chartaceous, ± elliptic, distantly crenate in distal half with c. 5 teeth per side; hairs present on stem and leaves, mostly straight to antrorsely curved but a few subuncinate ones present too, sessile spherical gland hairs (as present in the adult) apparently lacking.

Discussion

From the point of view of ex situ conservation we can be thankful that not only is *P. baylisiana* a "cast-iron" plant, with excellent resistance to wind, drought and even mild frost (Bannister 1984), but also that it has begun to show considerable ability to produce viable seed. The question now is what should be done with this seed towards conserving the species in the wild? - should it be sown on Great Is. (Three Kings Is.) or on some other offshore island, or even in a mainland situation?

Fig. 2 *Pennantia* seedlings and foliage. Scale bar= 15 cm. A. *P. baylisiana* seedlings (AK 258631). B. *P. baylisiana* (no voucher). Above, tuft of new foliage; lower left, sun leaf with strongly recurved margins; right, shade leaf. C, *P. endlicheri* (AK 254359). Adult leaf and new foliage.

Acknowledgments

We are grateful to have had information from Geoff Baylis (letters to ROG of 8 Nov '02 and 9 Jan '03) and Ross Beaver, and help from knowledgeable nurserymen Richard Main, Tony Palmer and Chris Soulje.

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■ **An inferred molecular phylogeny from nrDNA ITS sequences for *Pennantia* (Pennantiaceae)**

D. Jeanette Keeling, Richard C. Gardner, School of Biological Sciences, University of Auckland, Private Bag 92019, Auckland, **Peter J. de Lange**, Science & Research Unit, Department of Conservation, Private Bag 68908, Newton, Auckland.

Introduction

Pennantia baylisiana (W.R.B.Oliv.) Baylis (Pennantiaceae) (Fig 1.) is an unusual and highly threatened tree (see de Lange et al. 2004), known from just the one wild individual, which was discovered by the late Professor G.T.S. Baylis in 1946 on Great (Manawa Tawhi) Island (Three Kings Islands). Ever since its initial and ultimately incorrect placement in the Anacardiaceae, as a new monotypic genus *Plectomirtha* W.R.B.Oliv. (Oliver 1948), the species has been the subject of considerable taxonomic debate. This was started by Sleumer (1970) who correctly placed the genus into synonymy with *Pennantia* J.R. et G.Forst, but was of the opinion that the species was nothing more than a southerly extension of the Norfolk Island endemic *Pennantia endlicheri* Reissek. Baylis (1977) firmly challenged that view, providing characters to help distinguish both species, and making the necessary combination for the Three Kings plant in *Pennantia* as *P. baylisiana* (W.R.B.Oliv.) Baylis. Nevertheless Baylis's views have not been universally accepted (e.g., Davies et al. 2004; Green 1994).



Geoff Baylis, standing by his name sake *Pennantia baylisiana* on Great Island, Three Kings. Photo taken by Ewen Cameron on 2 December 1983, exactly 38 years after the trees discovery.

The most recent opinion was that offered by Gardner & de Lange (2002) who in a detailed morphological study monographed the genus, recognising four species, *P. corymbosa*, *P. cunninghamii*, *P. endlicheri* and *P. baylisiana*. Furthermore, they also maintained the monotypic section *Dermatocarpus* for *P. cunninghamii*, which is distinguished from the other three species by its elevated (rather than sessile) stigmas, coriaceous (not bony) endocarps, and presence of pit domatia, which are primarily located in the distal forks of the lateral veins. In the case of the highly threatened *P. baylisiana* (see de Lange et al. 2004) they stated: "even just the differences in habit and leaf character warrant the two [*P. baylisiana* and *P. endlicheri*] being separated at some level; since there are also differences in the position of the inflorescence and in stigma morphology we think that specific rank is deserved".

Recently, as part of broad based study by the University of Auckland to provide nrDNA Internal Transcribed Spacer Region (ITS) sequences for the entire New Zealand indigenous vascular seed flora, we have obtained ITS sequences from the four species of *Pennantia*. Here we present our conclusions from the ITS sequences obtained for the genus as our part toward helping further resolve the taxonomic distinctiveness of *Pennantia baylisiana*.

The Pennantiaceae

Recently there has been renewed interest in the familial position of the genus *Pennantia*. Previously the genus had been placed within an unwieldy, and paraphyletic Icacinaceae. However in a recent comprehensive revision of that family Kårehed (2001) realised that revival of the monogeneric Pennantiaceae was warranted. Kårehed (2001, 2003) had recognised the unique position of the genus and family through a combination of morphological, cladistic and DNA chloroplast (*ndhF*, *rbcL*, *atpB*, and *matK*) sequences, all of which confirmed the Pennantiaceae as a distinct monogeneric family occupying a potentially ancestral, certainly distant position to the rest of the Apiales. This opinion was subsequently upheld by both the Angiosperm Phylogeny Group (APG II) and by Davies et al. (2004). The chloroplast sequences Kårehed obtained were from the New Zealand *P. corymbosa* (the type of the genus) and the eastern Australian *P. cunninghamii*.

To both these studies we now add the results of our analysis using nrDNA ITS sequences obtained from all four species of *Pennantia*.

Methods

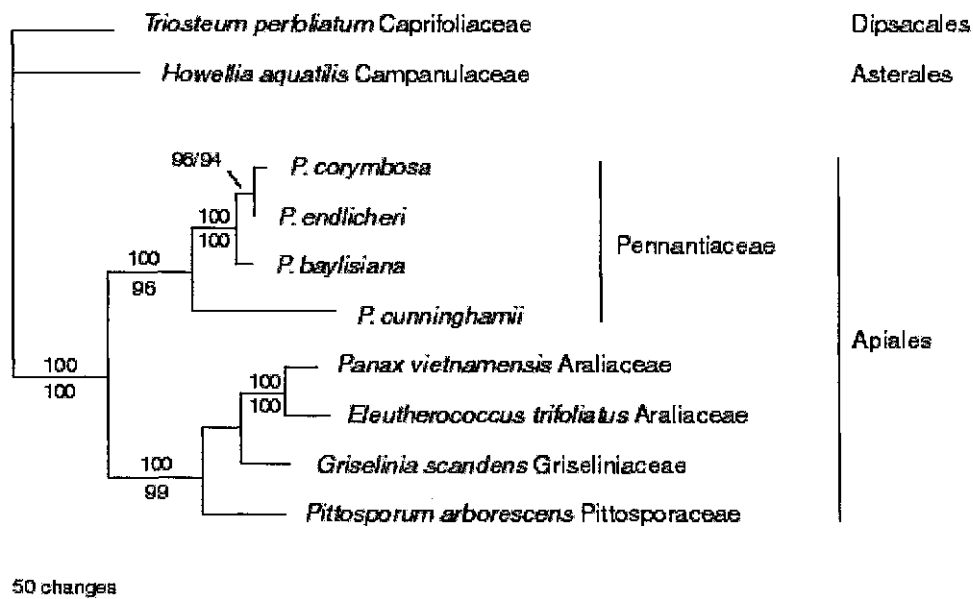
Young leaves and buds were sampled from all four species of *Pennantia*. With the exception of *P. cunninghamii*, vouchers of these specimens are lodged in the Auckland Museum Herbarium (AK). Genomic DNA was extracted using a QIAGEN DNAeasy® Plant Mini Kit. The ITS region was amplified using polymerase chain reaction (PCR) primers and conditions as described by Wright et al. (2001). The PCR products were sequenced at the School of Biological Sciences facility at the University of Auckland. Sequencing reactions were performed using the 3.1 ABI Prism™ BIG DYE Terminator Sequencing Kit and electrophoresed on an ABI 3100 DNA Sequencer. Forward and reverse sequences from each species were aligned and edited visually using ABI Autoassembler. The species sequences were aligned using Clustal and phylogenetic trees developed with PAUP 4.0b. As Pennantiaceae currently has no obvious close relative from which to provide a meaningful comparison, trees were constructed using a range of out-group species from the Apiales, Asterales and Dipsacales, based on the overall angiosperm relationships presented by Davies et al.(2004). The out-group sequences and their Genebank accession numbers were as follows: *Panax vietnamensis* AY271924, *Eleutherococcus trifolius* AY548191, *Triosteum perfoliatum* AY236175, *Howellia aquatilis* AF163433, *Griselinia scandens* AJ536586 and *Pittosporum arborescens* AF302026.

Bootstrap trees were generated using the distance, parsimony and maximum likelihood options within PAUP. All three trees were equivalent. The figure shows the parsimony-based tree that resulted from 1,000 bootstrap repeats. Bootstrap values using parsimony are shown above the line and those using distance are below the line.

Results

The nrDNA ITS sequences provide clear evidence of the distinctiveness of *P. baylisiana* (Fig. 2). The three species from New Zealand, Three Kings and Norfolk Island were the most closely related (Table1, Fig. 2). However, *P. baylisiana* differed from the other New Zealand species *P. corymbosa* at ten sites and from the Norfolk Island endemic *P. endlicheri* at 13 positions. In contrast the latter two species were much more closely related, differing at only four sites. These relationships contrast somewhat with the morphological evidence, which suggests that *P. endlicheri* and *P. baylisiana* are closely allied, if not “sister species” (Sleumer 1970; Green 1994; Gardner & de Lange 2002), amply distinct from the morphologically very divergent *P. corymbosa*.

Figure 2. Phylogeny of the Pennantiaceae based on ITS sequences.



The Australian species, *P. cunninghamii*, proved very distinct, with at least 15% sequence divergence from the ITS sequence of any of the other three *Pennantia* species. Figure 2 shows a phylogenetic tree of the four species in the context of their nearest angiosperm relatives. The tree consistently places *P. cunninghamii* on a branch by itself, with the other three species forming a clade that has *P. baylisiana* sister to a species pair of *P. endlicheri* and *P. corymbosa*.

Table 1. Nucleotide differences between the closely related *Pennantia* species from Oceania.

Nucleotide position	177	200	219	553-5560	586	599	668	675	696	713	
<i>P. corymbosa</i>	T	A	C	A--	G	C	C	C	C	A	C
<i>P. endlicheri</i>	C	A	C	GCC	G	C	C	C	C	A	C
<i>P. baylisiana</i>	G	C	A	GCC	A	T	T	G	T	G	T

Discussion

The ITS sequence obtained for *Pennantia baylisiana* demonstrate the distinctiveness of the species, and add further support to the wealth of existing morphological evidence (see Gardner & de Lange 2002), which already confirms the specific status of this highly threatened tree.

The sequence results also highlight the remarkable divergence of *Pennantia cunninghamii* from the other three species of the genus. These data are consistent with the morphological diversity noted by Gardner & de Lange (2002). Nonetheless, the four *Pennantia* species still formed a distinct clade within the Apiales (Fig. 2). This reinforces the previous conclusion based on morphology and chloroplast sequences that Pennantiaceae is a taxonomically sound family (Kårehed 2003). However, elevation of Sect. *Dermatocarpus* from sectional to subgeneric rank seems necessary.

Biogeographically the ITS result provides no clear clues as to the origin of the family, beyond that is, that it originated somewhere within the Australasian/Oceania Region. The data does suggest a relatively recent origin for *P. baylisiana*, *P. corymbosa*, and *P. endlicheri*, but the inferred close relationship between the large-leaved Norfolk Island endemic *P. endlicheri* and the heteroblastic, small-leaved New Zealand endemic *P. corymbosa*, is quite unexpected. Especially when one considers that these species are sister to the somewhat "intermediate" (both morphologically and geographically) Three Kings endemic *P. baylisiana*. Perhaps Wardle (1991) was correct in his view that some large-leaved ancestor of the modern *P. baylisiana*¹, *P. endlicheri*¹ and *P. corymbosa* persisted in the north, hybridising during warmer stadials to give rise to these species or their ancestors? Although further sequences should be consulted, there is some support for past hybridism, inferred from the presence of mixed nucleotide sequence in the ITS sequence of *P. baylisiana* (Table 1), and for the otherwise unlikely pairing of *P. endlicheri* and *P. corymbosa*.

Acknowledgements

We would like to thank Dr Lyn Craven, CSIRO, Canberra, Australia, for providing samples of *P. cunninghamii* for sequencing, and to Dr Shane Wright for assistance with MAF importation permits. We thank Marg Christian (Norfolk Island), Lisa Forester (Northland Conservancy, Department of Conservation) and Dr Rhys Gardner (Research Associate, Auckland Museum) for assistance in the field, their comments and encouragement. Paul Datson, Dr Peter Heenan and Bec Stanley offered useful comments on the text.

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¹ In their review of winter leaf loss within the New Zealand flora McGlone et al. (2004) provide a summary table of 27 indigenous woody species which undergo significant leaf loss over winter. Absent from that list is *Pennantia baylisiana*, the wild tree of which can loose between 50-80% of its foliage during autumn. In cultivation leaf loss is more varied, and the tree probably would qualify overall as semi-deciduous (*sensu* McGlone et al. 2004). Interestingly the same phenomenon is exhibited in cultivated New Zealand examples of *P. endlicheri*.

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Plant Records

■ New names, combinations, reinstatements, or comments from the journals (8)

E.K. Cameron, Auckland Museum, Private Bag 92018, Auckland

Native ferns and fern allies

"*Davallia* (Pteridophyta) in New Zealand, including description of a new subsp. of *D. tasmanii*" by M.J. von Konrat, J.E. Braggins & P.J. de Lange, *NZ J of Botany* 37: 586-593 (1999). *D. tasmanii* subsp. *crinata* von Konrat et al. is erected for the single population discovered by P.J. Bellingham in Puketi Forest (Northland) in 1984; and subsp. *tasmanii* is endemic to the Three Kings Is.

"New Zealand's pteridophyte flora – plants of ancient lineage but recent arrival" by P.J. Brownsey, *Brittonia* 53: 284-303 (2001).

Native conifers

"Morphology of female reproductive structures and an attempt of the construction of phylogenetic system of orders *Podocarpaceae*, *Cephalotaxales* and *Taxales*" by A.P. Melikian & A.V.F.Ch. Bobrov, *Botanical Journal* 7: 50-68 (2000) [in Russian]. Families and genera containing NZ taxa in the Order Podocarpaceae (6 families): new family Prumnopityaceae for *Prumnopitys* and their new genus *Stachypitys*, which they place the NZ miro into: *S. ferrugineus* (D. Don) A.V.F.Ch. Bobrov & Melikian; new family Dacrycarpaceae contains *Dacrycarpus*; new family Halocarpaceae contains *Halocarpus*; new family Dacrydiaceae contains *Dacrydium*; and *Podocarpus* in the Podocarpaceae. Order Taxales: Phyllocladaceae containing *Phyllocladus*. [Thanks to Josh Salter for a copy of this paper]

"Generic relationships within and between the gymnosperm families Podocarpaceae and Phyllocladaceae based on an analysis of the chloroplast gene *rbcl*." by J.G. Conran et al. [7 authors], *Aust. J. Bot.* 48: 715-724 (2000). The authors conclude that the work supports the monophyly of the Podocarpaceae, and that there was no support to segregate Phyllocladaceae, or for the separation of *Manoao* from *Lagarostrobos*.

"Phylogenetic assessment of the monotypic genera *Sundacarpus* and *Manoao* (Coniferales: Podocarpaceae) utilising evidence from 18S rDNA sequences" by D.G. Kelch, *Aust. Sys. Bot.* 15: 29-35 (2002). Twenty-nine taxa representing all recognised podocarp genera were sequenced and the resulting trees showed strong support for the Podocarpaceae, including *Phyllocladus*, and *Lagarostrobos franklinii* and *L. (Manoao) colensoi* comprised a clade with equivocal bootstrap support, favouring the retention of *L. colensoi* in *Lagarostrobos*.

Dicotyledons

Indigenous dicots

Three orthographic corrections: *Geum aleppicum* (not *G. allepicum*); *Matricaria discoidea* (not *M. dioscoidea*); *Pittosporum pimeleoides* subsp. *majus* (not subsp. *major*); and one back to the original spelling: *Drosera spatulata* (not *D. spathulata*) (Shaun Pennycook & Aaron Wilton pers. comm.).

Homalanthus A.Juss. (Euphorbiaceae) is conserved against the original spelling of *Omalanthus* (*Taxon* 48: 361, 1999); and *Exocarpos* (Santalaceae) has been conserved against *Exocarpus* (*ICBN*: 192, 1988).

"Taxonomy, ecology, and conservation of *Atriplex billardi* and *A. holloway* sp. nov. (Chenopodiaceae) in Australasia" by P.J. de Lange, D.A. Norton & G.M. Crowcroft, *NZ J of Botany* 38: 551-567 (2000). A new species from eastern, northern North Island is separated from the Australasian *A. billardi*.

"Dioecism in *Elingamita johnsonii* (Myrsinaceae)" by P.B. Heenan, *NZ J of Botany* 38: 569-574 (2000). Dioecism is confirmed.

- “Reinstatement of *Clematis petriei* (Ranunculaceae), and typification and variation of *C. forsteri*” by P.B. Heenan & J. Cartman, *NZ J of Botany* 38: 575-585 (2000). *Clematis petriei* Allan from Marlborough and Canterbury is reinstated as distinct from the widespread *C. forsteri* by a number of flower and achene characters.
- “Divergence estimates of *Tetrachondra hamiltonii* and *T. patagonica* (Tetrachondraceae) and their implications for austral biogeography” by S.J. Wagstaff, K. Martinsson & U. Swenson, *NZ J of Botany* 38: 587-596 (2000). Based on *rbcL* sequences the authors suggest that *T. hamiltonii* (NZ) and *T. patagonica* (S Am.) diverged during the Pliocene and are the result of recent long-distant dispersal rather than vicariance.
- “A revision of *Centipeda* (Asteraceae)” by N.G. Walsh, *Muelleria* 15: 33-64 (2001). The revision recognises 12 taxa, 4 of which occur in NZ: *C. aotearoana* N.G.Walsh sp. nov. (NZ endemic: Three Kings to L Wanaka); *C. cunninghamii* (Australia, NZ & N Caledonia); *C. elatinooides* (Less.) O.Hoffm. (Australia, NZ & Chile); *C. minima* subsp. *minima* (Russia to Australia, NZ, N Caledonia, Fiji & Samoa). All 4 are treated as indigenous to NZ except *C. cunninghamii* whose NZ status is unresolved.
- “*Sophora* (Fabaceae) in New Zealand: taxonomy, distribution, and biogeography” by P.B. Heenan; P.J. de Lange & A.D. Wilton, *NZ J of Botany* 39: 17-53 (2001). The *Sophora microphylla* complex is divided on leaf characters and juvenile growth form into 5 NZ endemic species: *S. microphylla* s.str. (N & S Is), *S. chathamica* Cockayne reinstated (northern NI, Wellington & Chatham Is), *S. fulvida* (Allan) Heenan & de Lange (Northland, Auckland & Waikato), *S. godleyi* Heenan & de Lange (southern NI), *S. molloyi* Heenan & de Lange (vicinity of Cook Strait); and *S. cassioides* for the Chilean and Gough Island plants, previously included in the *S. microphylla* complex by some authors.
- “Description and flavonoid chemistry of *Hebe calcicola* (Scrophulariaceae), a new species from north-west Nelson, New Zealand” by M.J. Bayly, Garnock-Jones, Mitchell, Markham & Brownsey, *NZ J of Botany* 39: 55-67 (2001). *H. calcicola* Bayly & Garn.-Jones is described and distinguished from the morphologically similar *H. rakaiensis*.
- “Phylogenetic relationships of species of *Aciphylla* (Apiaceae, subfamily Apioideae) and related genera using molecular, morphological, and combined data sets” by E.A. Radford, M.F. Watson & J. Preston, *NZ J of Botany* 39: 183-208 (2001). The combined data partly supports previous groupings and raises some new issues – but the resulting inferred phylogeny provides a framework for the interpretation of morphological characters in *Aciphylla*.
- “The identity of *Olearia buechananii* (Asteraceae)” by R.O. Gardner, P.J. de Lange & J.M. Fox, *NZ J of Botany* 39: 209-215 (2001). The detective work by the authors’ show that the NZ endemic *O. buechananii* Kirk known from the type specimen is conspecific to the Australian *O. viscosa*, and conclude that the Buchanan specimen must have been introduced to NZ.
- “A new *Coprosma* (Rubiaceae) from the Surville Cliffs, North Cape, New Zealand” by P.J. de Lange & P.B. Heenan, *NZ J of Botany* 39: 217-223 (2001). *C. spathulata* subsp. *hikuruana* de Lange & Heenan is separated from *C. spathulata* s.str. by the trailing habit, ellipsoid fruit and restriction to ultramafic rocks. Referred to as *C. spathulata* subsp. (b) by Eagle (1982).
- “Natural variation in *Olearia virgata* (Asteraceae)” by P.B. Heenan, *NZ J of Botany* 39: 382-393 (2001). A critical examination of Heads’ (1998) four subspecies of *O. virgata* concluded that *O. virgata* is a naturally variable species for which it is not possible to formally recognise variation.
- “Classification, origin, and diversification of the New Zealand Hebes (Scrophulariaceae)” by S.J. Wagstaff, Bayly, Garnock-Jones & Albach, *Ann. Missouri Bot. Gard.* 89: 38-63 (2002). Sequence data suggests that hebe arrived via long-distant dispersal to NZ, underwent diversification to give rise to 6 clades, and that there has been long-distance dispersal in relatively recent times from NZ to S America (twice), at least once to Australia, and also to N Guinea.
- “The annual taxa of the *Crassula sieberiana* complex in South Australia” by H.R. Töelken, *The South Australian Naturalist* 76: 4-13 (2002). Töelken breaks up his *C. sieberiana* subsp. *tetramera* into: *C. colligata* Töelken sp. nov. with two subspecies; *C. extrorsa* Töelken sp. nov.; and *C. tetramera*. Although he cites no NZ specimens P.J. de Lange (*NZ Bot Soc Newsletter* 73: 1113, 2003) has investigated the NZ situation: *C. colligata* subsp. *colligata* replaces the *C. tetramera* records for NZ, and possibly hybrids exist between this taxon and *C. sieberiana*.
- “A taxonomic reappraisal of *Coprosma obconica* Kirk (Rubiaceae: Anthospermeae)” by P.J. de Lange & R.O. Gardner, *NZ J of Botany* 40: 25-38 (2002). *Coprosma obconica* subsp. *distantia* is described as a new subspecies endemic to the ultramafic rocks at North Cape; leaving *C. obconica* s.str. occurring from the South Island and at a single locality in the North Island (near Taihape). With molecular support the new subspecies is raised to species level in a follow-up paper: *C. distantia* (de Lange & R.O.Gardner) de Lange - “A new combination for a *Coprosma* endemic to the serpentinised zone of the Surville Cliffs, North Cape, New Zealand” by P.J. de Lange, R.C. Gardner, S. Wright & Wichman, *NZ J of Botany* 40: 521-522 (2002).

- “*Dracophyllum marmoricola* and *Dracophyllum ophioliticum* (Ericaceae), two new species from north-west Nelson, New Zealand” by S. Ventor, *NZ J of Botany* 40: 39-47 (2002). *D. marmoricola* is prostrate and similar to *D. recurvum* and occurs on marble; *D. ophioliticum* is similar to *D. filiforme* and occurs on the ultramafics.
- “*Akama nubicola* (Cunoniaceae) a new species from western Northland, North Island, New Zealand” by P.J. de Lange, R.O. Gardner, & K.A. Riddell, *NZ J of Botany* 40: 525-534 (2002). A new tree discovered by Karen Riddell in July 2000 is only known from one location on a range crest in Waima Forest.
- “A new species of *Olearia* (Asteraceae) from Waima Forest, Northland, New Zealand”, by P.B. Heenan & E.K. Cameron, *NZ J of Botany* 40: 535-542 (2002). *Olearia crebra* was first discovered by John Beachman in 1982, and is a large-leaved species known only from Waima Forest.
- “Molecular systematics of the New Zealand *Pachycladon* (Brassicaceae) complex: generic circumscription and relationships to *Arabidopsis* sens. lat. and *Arabis* sens. lat.” by P.B. Heenan, A.D. Mitchell & M. Koch, *NZ J of Botany* 40: 543-562 (2002). Molecular data is used to assess the relationships of *Cheesemaniania*, *Ischnocarpus* and *Pachycladon* to each other and other related genera. The outcome is to sink the former two genera within *Pachypodon*, new combinations are made where required, and a new name *P. cheesemanii* is presented for *Ischnocarpus novae-zelandiae* as that species epithet is preoccupied in *Pachypodon*. New combinations: *Pachycladon cheesemanii* Heenan & Mitchell; *P. enysii* (Cheeseman) Heenan & Mitchell; *P. exilis* (Heenan) Heenan & Mitchell; *P. fastigiata* (Hook.f.) Heenan & Mitchell; *P. latisiliqua* (Cheeseman) Heenan & Mitchell; *P. radicata* (Hook.f.) Heenan & Mitchell; *P. stellata* (Allan) Heenan & Mitchell; and *P. wallii* (Carse) Heenan & Mitchell.
- “*Cardamine lacustris*, a new combination for *Iti lacustris* (Brassicaceae)” by P.B. Heenan, *NZ J of Botany* 40: 563-569 (2002). Molecular evidence showed *I. lacustris* nested among the NZ species of *Cardamine*.
- “Descriptions and flavonoid chemistry of new taxa in *Hebe* sect. *Subdistichae* (Scrophulariaceae)” by Bayly et al. [8 authors], *NZ J of Botany* 40: 571-602 (2002). Five new taxa are described: *Hebe crenulata* Bayly et al.; *H. cryptomorpha* Bayly et al.; *H. rigidula* var. *sulcata* Bayly & Kellow; *H. scopulorum* Bayly et al.; and *H. societatis* Bayly & Kellow. *Hebe scopulorum* is endemic to the North Island, the rest to the South Island. Note – recommendation 46C.2 of The St Louis Code (1999): After a name published jointly by more than two authors, the citation should be restricted to the first author followed by “et al.” or “& al.”, except in the original publication.

Adventive dicots

- Leontodon saxatilis* Lam. and *L. taraxacoides* (Vill.) Mérat (as *Hyoseris taraxacoides* Vill.) were described almost simultaneously for the same taxon. In central Europe *L. saxatilis* is the name most used, but in Britain, *Flora Europaea* and *Flora of NZ* the opposite is true. According to H.P. Fuchs-Eckert (*Feddes Rep.* 90: 646-49, 1980) Lamarck’s description appeared some weeks before Villar’s, and therefore *L. saxatilis* has priority (Christian Zidorn pers. comm.).
- “A putative hybrid in *Verbena* (Verbenaceae) and the application of the name *V. brasiliensis*” by P.W. Michael, *Telopea* 7(3): 299-300 (1997). Wild putative hybrids recognised in Australia and NZ (Hokianga Co., A.E. Wright 9480) appear to match the type of *V. brasiliensis* and should therefore be referred to as: *V. × brasiliensis* Vell. Field observations in Australia suggest the parents are *V. litoralis* and *V. quadrangularis*. Fertile plants with subpetiolate or petiolate leaves previously known as *V. brasiliensis* (in Australia) should now be referred to as *V. quadrangularis*.
- “New species, new combinations and other name changes in *Hakea* (Proteaceae)” by R.M. Barker, *J of Adelaide Bot. Gardens* 13: 95-110 (1999). *Hakea drupacea* (C.F.Gaertn.) Roem. & Schult published in 1810 has priority over Robert Brown’s *H. suaveolens* of 1810.
- “The name of the apple” by D.J. Mabberley, Jarvis & Juniper, *Telopea* 9(2): 421-430 (2001). The orchard apple is not the result of hybridism with other *Malus* spp., and if *Malus* is maintained then the correct name should be *M. pumila* Mill., however, if the broad view of *Pyrus* is taken then the name would revert to *P. malus* L.
- “*Passiflora tarminiana*, a new cultivated species of *Passiflora* subgenus *Tacsonia* (Passifloraceae)” by G. Coppens d’Eeckenbrugge, Barney, Jørgensen & MacDougal, *Novon* 11: 8-15 (2001). This has resulted in several name changes for the naturalised species in NZ: *Passiflora tarminiana* Coppens & V.E. Barney is the new name for many collections previously treated as *P. mixta* in NZ; *P. mollissima* is reduced to *P. tripartita* var. *mollissima*; and *P. mixta* is now treated as very local in NZ (W Auckland & Marlborough). “*Passiflora* (Passifloraceae) in New Zealand: a revised key with notes on distribution” by P.B. Heenan & W.R. Sykes, *NZ J of Botany* 41: 217-221 (2003) – updates the situation for the wild taxa in NZ.
- “A morphological analysis of *Hedera* L. (the ivy genus, Araliaceae) and its taxonomic implications” by J. Ackerfield & J. Wen, *Adansonia* 24(2): 197-212 (2002). Twelve species are recognised, and the 2 subspecies naturalised in NZ are now recognised at species level: *H. canariensis* and *H. helix*;

- the later has two subspecies. "Trichome morphology in *Hedera* (Araliaceae)" by J. Ackerfield, *Edinb. J. Bot.* 58: 259-267 (2001) – provides a key based on the trichomes.
- "New combinations in Chinese *Cotoneaster* (Rosaceae)" by Lu Lingti & A.R. Brach, *Novon* 12: 495-496 (2002). *Cotoneaster glaucophyllus* f. *serotinus* is elevated to: *C. glaucophyllus* var. *serotinus* (Hutch.) L.T.Lu & A.R.Brach, and occurs naturally from 1900 to 3000m in western Yunnan Province of China.
- "*Potentilla* and *Fragaria* (Rosaceae) reunited" by D.J. Mabberley, *Telopea* 9(4): 793-800 (2002). Because of morphological, genetic and DNA evidence *Fragaria* is sunk into *Potentilla*. The alpine strawberry naturalised in NZ can now be known as *Potentilla vesca* (L.) Scop.
- "Taxonomy of *Pennantia* (Icacinaceae), a small isolated Pacific genus" by R.O. Gardner & P.J. de Lange, *J of the Royal Soc. of NZ* 32: 669-695 (2002). A detailed morphological study of the genus is presented containing 4 species: *P. baylisiana* & *P. corymbosa* (NZ); *P. cunninghamii* (Australia); and *P. endlicheri* (Norfolk I).

Monocotyledons

Indigenous monocots

- "Xeronemataceae, a new family of asparagoid lilies from New Caledonia and New Zealand" by M.W. Chase, Rudall, Fay & Stobart, *Kew Bulletin* 55: 865-870 (2000). The new family Xeronemataceae is described, consisting of a single genus, *Xeronema*, with two species, one each from NZ and N Caledonia. Previously placed in the Phormiaceae, morphological grounds and results from DNA sequencing strongly support the separation of *Xeronema* into its own family.
- "Genotypic variation of seedlings of wild populations of *Cordyline australis* (Lomandraceae) in New Zealand" by W. Harris & R.E. Beaver, *NZ J of Botany* 38: 597-606 (2000). Cultivated seedlings exhibited clinal variation with leaves becoming longer, narrower and having a higher frequency of red-brown colouration from north to south.
- "Genotypic variation of leaf characters of wild populations of *Cordyline australis* (Lomandraceae) in New Zealand" by W. Harris & R.E. Beaver, *NZ J of Botany* 40: 457-472 (2002). Cultivated 5- to 6-year-old trees raised from wild sourced seed showed overall leaves became longer, broader and petioles less defined from north to south. The results support the need to protect wild stands across the species range in order to protect its genetic variants.
- "*Juncus edgariae* (Juncaceae) – a new species from New Zealand" by L.A.S. Johnson & K.L. Wilson, *Telopea* 9(2): 399-402 (2001). The authors separate and describe this new species that has previously been included in the Australian *J. gregiflorus*. Also most (all?) of the wool shoddy records in Great Britain are *J. edgariae*.
- "A new, dodecaploid species of *Uncinia* (Cyperaceae) from ultramafic rocks, Surville Cliffs, Northland, New Zealand" by P.B. Heenan & P.J. de Lange, *NZ J of Botany* 39: 373-380 (2001). *Uncinia perplexa* is described as a new North Cape endemic.
- "Regional endemism in New Zealand grasses" by H.E. Connor, *NZ J of Botany* 40: 189-200 (2002). Regional endemism is present for one third of the grass taxa (60 taxa) with the highest frequencies in the northern and southern South Island.
- "A taxonomic revision of *Libertia* (Iridaceae) in New Zealand" by D.J. Blanchon, B.G. Murray & J.E. Braggins, *NZ J of Botany* 40: 437-456 (2002). Three new species are described honouring female NZ botanists: *L. cranwelliae*, *L. edgariae*, and *L. mooreae*; and *L. micrantha* A.Cunn. is resurrected for NZ material formerly included within *L. pulchella* from Tasmania, E Australian and N Guinea.
- "The grasses John Buchanan illustrated in *The indigenous grasses of New Zealand* (1878-1880)" by H.E. Connor & E. Edgar, *Tuhinga* 13: 45-69 (2002).
- "A monograph of the genus *Isolepis* R.Br. (Cyperaceae)" by A.M. Muasya & D.A. Simpson, *Kew Bulletin* 57: 257-362 (2002). Sixty-nine species are recognised for this predominately southern hemisphere genus. Changes for taxa in NZ: *I. nodosa* is transferred to *Ficinia nodosa* (Rottb.) Goetgh. et al.; and varieties are erected for two species *I. cernua* var. *cernua* (widespread in both N & S hemispheres), and *I. fluitans* var. *fluitans* (native to Europe, Africa, India & Australasia).
- Based on morphological and DNA work over one-third of the NZ native orchids have been split into different genera in a series of recent papers: "Genera et Species Orchidaliun 1" by D.L. Szlachekto, *Polish Botanical Journal* 46: 11-26 (2001); "Nomenclatural notes arising from studies into the tribe Diurideae" by D.L. Jones, Clements, Sharma, Mackenzie & Molloy, *The Orchadian* 13: 437-468 (2002); and "Nomenclatural changes in the Australian and New Zealand Bulbophyllinae and Eriinae (Orchidaceae)" by D.L. Jones, & M.A. Clements, *The Orchadian* 13: 498-501 (2002). These changes have been well summarised by P.J. de Lange in the following *NZ Bot. Soc. Newsletters*: 68, 69 & 72. For a complete update see Ian St George's NZ orchid list, *NZ Native Orchid Group Newsletter* 84: 22-30 (2002).

Adventive monocots

XSchedololium Holub is the correct condensed name, author and citation for *XSchedololium* Soreng & Terrell in NZ Flora vol. V (Henry Connor pers. comm.).

Nothoscordum borbonicum Kunth (Alliaceae) is the correct name for *N. inodorum* auct. non (W.T.Aiton) G.Nicholson, and *N. gracile* auct. non (W.T.Aiton) Stearn.

"A monograph of the genus *Isolepis* R.Br. (Cyperaceae)" by A.M. Muasya & D.A. Simpson, *Kew Bulletin* 57: 257-362 (2002). The naturalised *Isolepis platycarpa* from Australia has been reduced to *I. cernua* var. *platycarpa* (S.T.Blake) Muasya (no NZ collections cited); and *I. australiensis* is confirmed for NZ (cf. Flora of NZ vol. III, p.194).

General

"Composition of the New Zealand seed plant flora" by A.D. Wilton & I. Breitwieser, *NZ J of Botany* 38: 537-549 (2000). The statistics include the number of wild species, genera and families; the number of species in the largest genera and families; and species numbers according to biostatus categories.

"Seeds of New Zealand gymnosperms & dicotyledons" by C.J. Webb & M. Simpson, Manuka Press, Christchurch, (2001). For the first time an account of the NZ native seeds is assembled with over 1750 illustrations.

"Contributions to a chromosome atlas of the New Zealand flora – 37. Miscellaneous families" by P.J. de Lange & B.G. Murray, *NZ J of Botany* 40: 1-23 (2002). Chromosome numbers are presented for 156 taxa, of which 122 are new counts for NZ taxa; a summary of each genus is also presented.

"Checklist of dicotyledons, gymnosperms, and pteridophytes naturalised or casual in New Zealand: additional records 1999-2000" by P.B. Heenan, P.J. de Lange, E.K. Cameron & P.D. Champion, *NZ J of Botany* 40: 155-174 (2002). Six new species are reported as naturalised and 71 as new casuals.

For the rest of this series see *NZ Bot. Soc. Newsletters* 36, 37, 42, 46, 50, 56, and 62.

BIOGRAPHY/BIBLIOGRAPHY

■ Biographical Notes (54) : John Carl Ernest Dieffenbach (1811–1855)

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My main reason for adding yet another item to the already extensive body of writing about Ernest Dieffenbach is to provide an itinerary of his visit to New Zealand in 1839–41. His *Travels in New Zealand*, published in 1843 (1), is not always in chronological order and also lacks an account of his visit to the Chatham Islands. Nor is the New Zealand section of his biography (2) strong on narrative. Dieffenbach's ideas and opinions are emphasized rather than his travels. Nevertheless, from these two works and a few other sources it is possible to put together an orderly outline of where Dieffenbach went, and when and why he went there. I hope that this will be of some use to anybody embarking upon a study of this remarkable man, the first German naturalist to visit our shores after the Forsters.

Ernest Dieffenbach was born on 27 January 1811, in Giessen, a small university town in western Germany. He was the son of a protestant clergyman who was also professor of theology at Giessen University. In 1828 Ernest enrolled as a medical student in Giessen but, in 1833, because of political activities, was forced to flee Germany to Strasbourg across the border in Alsace, and from there to Zurich in Switzerland in 1834 (2).

In 1835 Ernest completed the degree of M.D. at the University of Zurich, but pressure from Germany led to his deportation to France in August, 1836. He finally found refuge in England, arriving in London at some time in 1837. Here he scraped a living from translations and teaching, until in April, 1839, he was appointed naturalist to the New Zealand Company on the recommendation of the Royal Geographical Society. (There seems no evidence that he was recommended by Charles Darwin or Charles Lyell as sometimes stated.) "He was to be paid the sum of fifty pounds as an outfit and he was to require no salary but to be remunerated by the Company according to his exertions" (2).

1. The voyage: 5 May–17 Aug. 1839

The barque *Tory* left Plymouth on 5 May, 1839, bound for Queen Charlotte Sound, New Zealand. She was commanded by Edward Chaffers who had served under Fitzroy during the *Beagle's* and Darwin's voyage around the world in 1831–36. This advance party was led by Colonel William

Wakefield who was accompanied by his nephew, Edward Jerningham Wakefield (aet. 18). Also on board were Charles Heaphy, the Company's draughtsman (aet. 19), Mr Robinson, the ship's doctor, and John Dorset (Fort Dorset?) the colony's first surgeon (2). This shows that Dieffenbach was not appointed ship's doctor as well as naturalist as some claim. After a "fast" passage of 96 days the Tory arrived in Queen Charlotte Sound on 16 August, 1839, and next day was warped into Ship Cove, Cook's old anchorage, and moored to a tree (1).

2. The Marlborough Sounds: 18 Aug.–20 Sept. 1839

At Ship Cove Dieffenbach made "daily excursions, which were extended as far as the dense virgin forest would allow me to penetrate" (1). He ascended the two highest hills at the back of Ship Cove and visited Cannibal Cove and Motuara Island. He studied the geological formations and the soil and began his studies of the Maori, about whom he wrote so sympathetically and wisely; and he described the vegetation and mentioned the important species. On 31 August the Tory sailed up Queen Charlotte Sound and then explored the channel that Chaffers named after her. She anchored at Te-awa-iti, a whaling settlement on Arapawa Island near the eastern entrance to the channel. From here Dieffenbach explored Arapawa Island and went to Port Underwood. And here the expedition met Dicky Barrett, who had been trading on the New Zealand coast since 1828. His local knowledge was to be of great use to Colonel Wakefield, and his knowledge of whaling must have contributed much to Dieffenbach's several pages on the subject (1,3).

During the outward voyage Dieffenbach had written a letter to his parents, which is quoted in full by Bell (2). In it he says: "If you look on the map you will find a spot called Queen Charlotte Sound. It is to be our first anchorage. After having investigated the place and laid the foundation stone for a new town we shall sail round the North Island..." But, they had seen no suitable site for settlement in the steep-sided Sound and the Channel, and on 20 September, on Barrett's advice, they sailed across Cook Strait to Port Nicholson and Petone.

3. Port Nicholson and Petone: 20 Sept.–Oct. 1839

During this time "the agent of the New Zealand Company completed the purchase of that place;" and it was probably during this first visit to Port Nicholson that Dieffenbach shot "two or three" huia with the help of a Maori who decoyed them. Dieffenbach sent specimens to Gould who depicted them in *The Birds of Australia*. (1)

4. Cook Strait: 4 Oct.–18 Nov. 1839

Colonel Wakefield's next objective was to buy land in the region of Cook Strait and in Taranaki, and to help him he sought the aid of Barrett. The Tory therefore re-crossed Cook Strait on 4 October and anchored in Port Underwood (which Dieffenbach usually calls Cloudy Bay). Here she stayed until 13 October, when she went around to Te-Awa-iti to pick up Barrett, his whaler-assistant, James Heberley, and his American-Negro cook, "Black" Lee. Then on 15 October, she sailed for Kapiti, anchoring between that island and the mainland next afternoon. During the following fortnight Dieffenbach tended the wounded at an inter-tribal fight at Waikanae on the mainland and visited Kapiti and Mana Islands. And he met Te Rauparaha.

On 31 October, the Tory sailed from Mana Island to East Bay, at the western end of Arapawa Island in Queen Charlotte Sound. As Dieffenbach explained: "the agent of the New Zealand Company had purchased from those of this tribe who reside at Kapiti all their remaining claims to the land on both sides of Cook's Strait, and he was now proceeding to purchase the claims of those residing in East Bay" (1). Dieffenbach visited West Bay across the Sound and crossed Arapawa to Te-awa-iti. As usual he noted the plants, and I quote his entry for East Bay as one of the earliest descriptions of the anthropophytes (plants introduced by cultivation) that were settling in New Zealand.

"They [the Maori] had walked over to settle about the sale of their land; they have plantations here. The cabbage, which now abounds in Queen Charlotte's Sound, and which grows wild, was in blossom, and covered the sides of the hills with a yellow carpet. There are a number of plants in New Zealand which are exactly the same as in Europe. Many of them are indigenous, others have spread with the cultivation of European vegetables. Such are the cabbage, *Plantago major*, *Alsine media*, *Sonchus oleraceus*, *Stellaria media*, *Rumex crispus*, *Urtica dioica*, *Cytisus bullosa*, *Anagallis arvensis*."

On 10 November the Tory left East Bay and next day reached Kapiti. Here she was weatherbound until the 18th when she left for Wanganui, where the Company had bought land from chiefs visiting Waikanae.

5. Taranaki: 18 Nov. 1839 –21 Feb. 1840

The shallow bar at the mouth of the Wanganui River prevented the Tory from visiting that place, and bad weather delayed their arrival at the Sugarloaf Islands (off where New Plymouth now stands) until the 27th. Next day she left this unfavourable anchorage and sailed north, leaving Dieffenbach, Barrett (who had close ties with the local Maori), Heberley, "Black" Lee, and a whale boat. On 3 December 1839 Dieffenbach set off to climb Mount Taranaki (Egmont) accompanied by Lee and guided by an old tohunga, Tangutu, who had vegetable gardens hidden in the bush. A circuitous route in persistent heavy rain took them only to the foot of the mountain by the 11th, and with food running out, they turned back, reaching the coast on the 15th. Dieffenbach's second attempt began on 19 December, with a larger party. Lee and Tangutu were joined by Heberley and E. Kake, a chief, with his slave. A more direct route took them to their previous furthest limit in only 4 days. Proceeding up the Waiwhakaho River and its adjacent ridges, they reached c. 5500 feet on Christmas Eve and camped "amidst the stunted and dwarfish shrubs, amongst which I observed the *Dracophyllum rosmarinifolium*, *Solidago arborescens*, and several compositous plants" (1). On Christmas Day the Maori attendants stayed at the snowline and Dieffenbach, Heberley, and Lee continued. The latter survived a fall and returned but Dieffenbach and Heberley reached the summit. The party arrived back at the coast on 28 December 1839. A detailed account of this ascent is given by Temple (4).

About this time, Dieffenbach's party moved camp from under the whale-boat on the dunes to Moturoa, the largest of the Sugarloaf islands, because of a threatened invasion from the north. This did not deter him from two excursions northwards. On 31 January he made a day's trip in the whale boat to the Waitara River, and from 10 January 1839 he made an 8-day trip to Mokau. As the Tory was delayed in the north, the brig Guide arrived on 31 January bringing officials to buy Taranaki land. She left on 16 February for Port Nicholson, with Dieffenbach on board and arrived on the 21st. During his absence the Cuba, another Company vessel, had arrived bringing William Mein Smith, the Company's surveyor.

6. The Chatham Islands: mid-May–26 June, 1840

As a result of a proclamation by Lieutenant-Governor Hobson restricting purchase of land after 1 February 1840, the Cuba was sent to buy Chatham Island, which many considered was not part of New Zealand. (It is perhaps for this reason that Dieffenbach did not include the Chathams in his Travels.) On board the Cuba were H.D. Hanson (the Company's agent), Heaphy and Dieffenbach. Their visit is commemorated by the Cuba Channel, Mount Dieffenbach, the Heaphy Shoal, and Hanson Bay. The time spent at the Chathams has been variously stated even by Dieffenbach himself who wrote of:

"..the result of many excursions in the largest island of the Group, during a stay of nearly three months of the Cuba on its coasts..." (5).

"During the two months of our stay at this island in May, June, and July..." (6).

"We anchored in Waitangi Bay, in the middle of May, 1840, and remained constantly on the coast until the 26 July" (7).

Bell (2) gives "May to July 1840" despite showing in her Appendix "that it would therefore appear that 26 July is a misprint and should read 26 June."

I cannot explain (and nor does it) why the Dictionary of New Zealand Biography (1990) allows Dieffenbach only "about four weeks" at the Chathams.

7. The Eritonga (Hutt) Valley: 30 July–14 Aug. 1840

In the hope of finding an overland route from Port Nicholson to the Manawatu or the Wairarapa, Dieffenbach made a 16-day exploration up the Hutt Valley. He was accompanied, at first, by four Europeans, but on the fourth day he met John Deans (later of Canterbury) who had a contract for cutting survey lines, and Deans and two of his men joined the party. They followed the east branch of the Hutt to the Tararua foothills. At the "highest summit" reached Dieffenbach climbed a tree, so they were still in bush when they turned back (1).

8. New South Wales: c. Sept.–Oct. 1840

A visit to Australia (presumably on his way home after his work in New Zealand was completed) was always part of Dieffenbach's plan. He mentions it in a letter written on the outward voyage, and another from Cloudy Bay in October 1839, both quoted by Bell (2). But as things turned out, he returned to New Zealand to see more of the country. He wrote that after a visit "to New South Wales, but more especially to that district — which lies on the Hunter's River, I returned from Sydney to New Zealand in the Cuba, arriving in the Bay of Islands in October, 1840, after a voyage of only eight days." (1:p.197) Bell (2) does not mention this, but quotes an announcement in The Australian that the

Cuba sailed on 12 November 1840, for Port Nicholson, with Dieffenbach and Hanson among the passengers. I will leave a future biographer to sort this out, but must disagree with the view, accepted by Bell (2) that Dieffenbach spent five months in New South Wales. The only other mention of this visit that I can find is Dieffenbach's mention of finding pumice "in Newcastle, at the mouth of the Hunter's River" and the suggestion that it had floated from New Zealand (1:p.359).

9. North Auckland: c. Oct. 1840 – Mar. 1841

Dieffenbach's account of this part of his travels is undated. It moves from north to south and, in the main, this must be the chronological order. North of Whangaroa, at least, he travelled on the little 16-ton schooner of Captain Bernard, "an adventurous Frenchman" (1). They anchored in Parengarenga Harbour, and Dieffenbach describes Cape Maria van Diemen and North Cape. Then follow descriptions of Houhora Harbour and Mount Carmel (sic), Rangaunu Harbour, Kaitaia, and Manganui and Whangaroa harbours. Dieffenbach then went overland to Hokianga on the west coast and back through Waimate and Kerikeri to the Bay of Islands. Here we have a date, because in a letter headed "Bay of Islands, 16 February, 1841" Dieffenbach applied to Lieut.-Governor Hobson at Government House, Russell, to "exchange my position to the Company with a similar one under Government." The application – quoted in full in (2) – also states: "Thus, travelling through the country in all directions would be my chief employment. If the foundation of a public museum, and the establishment of a botanical garden, should be intended the arrangement of the former and the superintendence of the latter seem also to belong to the department of the naturalist. I need not observe how highly beneficial the botanical garden could be made for developing the agricultural resources of the infant colony." Hobson supported the application in a letter dated 17 February to the Governor, Sir George Gipps, in Sydney, but it was declined both there and in London. While in the Bay of Islands, Dieffenbach lived next door to Colenso. He then went overland from the head of the Kawakawa to the Wairoa and the Kaipara Harbour and on to the infant settlement of Auckland.

10. Auckland to near Tongariro and return via Thames: 31 Mar.–c. 9 July, 1841

Dieffenbach left Auckland with Lt. Best on 31 March 1841. They went south down the coast to Kawhia where they met Capt. William Symonds, Deputy Surveyor-General of New Zealand. Proceeding inland they reached the Waipa Valley, which they followed to the Waikato and from there reached Lake Taupo on 11 May. After canoeing down the west side of the lake they continued over Pihanga to Lake Rotoaira, but were forbidden to climb Tongariro by the Maori and returned to the lake on 21 May. Their route north lay through lakes Rotomahana (where Dieffenbach saw the pink and white terraces), Tarawera (which he was surprised to find lined by pohutukawa), and Okareka, until, on 4 June they arrived at Lake Rotorua. Here they stayed until 14 June with Mr Chapman, the missionary. Two days later they arrived at Tauranga and stayed with the missionaries until the 22nd. Their route back to Auckland lay through Matamata and down the Piako by canoe where bad weather held them up until 5 July. Continuing downriver they crossed flooded swamps to the mission-station at Puriri on the Waiho, arriving on the 7th; and from here they reached Auckland two days later via the Firth of Thames and Waiheke Island. Pascoe (8) gives a map of this journey but wrongly gives the year as 1842. Ell and Ell (9) reproduce Dieffenbach's journal from Taupo to Rotorua.

By January, 1842, Dieffenbach was back in London. In 1843 his *Travels in New Zealand* was published, and in 1844 appeared his German translation of Darwin's *Journal of Researches*. The latter was instigated by two famous Germans, Justus von Liebig and Alexander von Humboldt, according to Charles Darwin (10). Dieffenbach was finally allowed to return to Giessen where he became Professor of Geology in 1849, and where he died on 1 October 1855. He was only 44.

For a contemporary evaluation of Dieffenbach's contribution to New Zealand botany we may turn to the Introductory Essay of J.D. Hooker's *Flora Novae-Zelandiae* (1853) and the Preface to his *Handbook of the New Zealand Flora* (1864). In the former Dieffenbach is listed with Colenso, Sinclair, Bidwill, Raoul and Lyall as standing pre-eminent "as indefatigable explorers and collectors within the last twelve years." Hooker also notes that "Mr Bidwill and Dr Dieffenbach were the first explorers of the lofty mountains of the interior," but that he brought "very few plants" from Chatham Island, "all identical or closely allied to New Zealand species."

A decade later Hooker wrote in the "Handbook" that "in 1840 Dr Dieffenbach visited many parts of the Northern Island and northern part of the Middle Island, and is the first person who ascended Mount Egmont. His collections, which are however most scanty, compared with the great extent of interesting ground he passed over, were also communicated to Sir W. Hooker's herbarium." But Dieffenbach was not engaged as a botanist but as a naturalist and made observations on geography, geology, botany, and natural history, as the sub-title of his "Travels" announces. Surprisingly though, his sub-title does not mention ethnology, which is where his major contribution lies. More than two-

thirds (277 pages) of the second volume of his "Travels" is devoted to an account of the Maori, their customs, beliefs, and language. (The remainder is a list of the animals of New Zealand by J.E. Gray of the British Museum.)

As for the botany, the narrative in the first volume is full of observations on the vegetation, particularly important because much of it describes the new vegetation induced by man, whether Maori or Pakeha. The last chapter of Vol.1 of the "Travels" is entitled "Some remarks on the botany of New Zealand." It lists the families and genera of Cryptogams and Phanerogams recorded from New Zealand up to the time of the Cunninghams and makes some general observations on the flora and vegetation, including the following:

"the scantiness of annual and flowering plants of which only a few possess vivid colours and would attract the attention of the florist"

"the grasses have given way to ferns"

"the greater number of species and even genera are peculiar to the country"

"New Zealand with some of the adjacent islands forms a botanical centre."

Eponymy

1843 *Drapetes dieffenbachii* "HAB. High mountains of the Northern Island, New Zealand; Mount Egmont, Dr Dieffenbach; Tongariro [actually Ngauruhoe] J.T. [sic] Bidwill Esq." "I have already, in speaking of a new *Calceolaria* of New Zealand (*Icones Plantarum*, vol. 6, TAB DLXI), had occasion to observe an affinity in the vegetation of that country to that of the more temperate parts of South America, particularly in the existence of certain genera which had previously been supposed to be peculiar to the extratropical portion of the great South American Continent. The discovery of a new *Drapetes* in New Zealand serves to strengthen that affinity. I first received beautiful specimens of this species that were gathered by Dr Dieffenbach, on the summit of Mount Egmont, and I found the same in a collection of plants kindly given me by Mr Bidwill from the summit of Tongariro [sic] another big mountain of the Northern Island of New Zealand. I have the pleasure to name this after its first discoverer." W.J. Hooker London J. Bot. 2: 497. (Note that it was Bidwill who was the first collector, ascending Ngauruhoe on 3 March 1839, whereas Dieffenbach did not ascend Egmont (Taranaki) until 25 December).

1846 *Veronica dieffenbachii* "Hab. in ins. Chatham juxta Novam Zeelandiam (Dieffenbach!)." G. Bentham in A. de Candolle's *Prodromus* 10: 459.

1864 *Gingidium dieffenbachii* "The name of Dr Ernest Dieffenbach is attached to this plant for commemorating that we owe to this philosopher the first record of the indigenous natural productions of the Chatham-group" F. Mueller Veg. Chatham Is. 17.

Dieffenbach Point: at the junction of Queen Charlotte Sound and the Tory Channel.

Dieffenbach Cliffs: in Egmont National Park.

Mount Dieffenbach: one of several small volcanic cones on the north-west peninsula of Chatham Island.

Acknowledgments

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PUBLICATIONS

Journal Received

New Zealand Native Orchid Group Journal No. 90 – March 2004

Edited by Ian St George [ISSN 1170-4543]

Original paper: Kelly Rennell – *Petalochilus* species: red lips of Fiordland.

New Zealand Native Orchid Group Journal No. 91 – June 2004

Edited by Ian St George [ISSN 1170-4543]

Original papers: Gordon Sylvester – West Coast ramblings; Graeme Jane and Gael Donaghy – Some Christmas orchids.

