

NEW ZEALAND BOTANICAL SOCIETY

NEWSLETTER

NUMBER 73

SEPTEMBER 2003



New Zealand Botanical Society

President: Anthony Wright
Secretary/Treasurer: Doug Rogan
Committee: Bruce Clarkson, Colin Webb, Carol West

Address: c/- Canterbury Museum
Rolleston Avenue
CHRISTCHURCH 8001

Subscriptions

The 2003 ordinary and institutional subscriptions are \$25 (reduced to \$18 if paid by the due date on the subscription invoice). The 2003 student subscription, available to full-time students, is \$9 (reduced to \$7 if paid by the due date on the subscription invoice).

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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 December 2003 issue (74) is 25 November 2003.

Please post contributions to: Joy Talbot
17 Ford Road
Christchurch 8002

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

Smooth witchgrass (*Panicum dichotomiflorum*) – indigenous to North America, and naturalised in New Zealand mainly in the northern half of the North Island (common in the Waikato and urban Auckland). A tufted summer annual, reaching 1m tall; occurring in grass verges, gardens, pasture, waste places and as a weed in crops.

Drawn by Alan Esler.

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NEWS

New Zealand Botanical Society News

■ From the Secretary

Call for nominations

Nominations are called for the following positions of Officers and Committee of the New Zealand Botanical Society for 2004:

- President
- Secretary/Treasurer
- 3 Committee Members

Nominations for all positions opened 1 September 2003 and close on 20 November 2003. Nominations shall be made in writing to the Secretary, C/- Canterbury Museum, Rolleston Avenue, Christchurch 8001, and shall be signed by the Proposer, the Seconder, and by the Nominee to indicate their acceptance of nomination. If necessary, ballot papers for a postal election will be circulated with your December Newsletter.

Interest is also called for the ex-officio position of Newsletter Editor. An essential means of communication for our society, this voluntary position would ideally suit a person who is accurate in their work, has a keen interest in Botany and has the time to put together four newsletters a year. Support will be given initially. Please contact the Secretary if interested.

Allan Mere Award 2003

The NZBS Committee is pleased to announce that it has this year chosen to award the Allan Mere to Colin Ogle of Wanganui in recognition of his outstanding contributions to New Zealand botany. **The award will be presented to Colin at a morning tea function at Landcare Research in Lincoln on Friday the 24th October at 10 am. All welcome.**

Peter de Lange and David Norton, in nominating Colin, outlined the contribution he has made to New Zealand Botany in the following extract:

"Colin Ogle has had a distinguished career as a professional New Zealand Botanist working for the former Wildlife Service 1978-1987 when his position was rolled over to the then new Science & Research Division of the Department of Conservation. During 1988 Colin took up the position of Conservation Advisory Scientist with the Wanganui Conservancy, a position he held until his retirement in February 2001. Since then Colin has maintained an interest in the New Zealand and Pacific Flora working as a part-time consultant for the Department of Conservation and other agencies.

In the Wildlife Service and Department of Conservation Colin has had a strong influence on the development of the botanical skills of the various employees he has met, and it is primarily for this (and his encouragement of students when he first embarked on his career as a science teacher in Te Puke and Tawa) that we have elected to nominate him for this award.

Colin was a protégé' of the late Tony Druce, and this is evident in his meticulous attention to detail in his herbarium labels, papers, reports and popular articles. During his botanical career Colin has contributed an estimated 6000 herbarium specimens to New Zealand herbaria, mainly (but not exclusively) depositing these in the Allan Herbarium (CHR) but also leaving an excellent set of specimens in WELT, and more recently AK and NZFRI. Colin has always been extremely helpful in meeting plant requests from professional botanists, and has a very keen eye for the unusual. This is especially evident if one reads the notes in Flora 4 and 5. Many new plant records have (and continue to) come from sites Colin Ogle has frequented, e.g., Wellington, Pukerua Bay, Wanganui and Taranaki. Aside from his herbarium Colin prepared detailed botanical accounts of Great Barrier,

Whale, D'Urville and Mana Islands. These are especially significant resources for future workers, especially with regard to their detail and botanical accuracy.

Aside from his own botanical collections Colin has worked tirelessly as President of the Wellington Botanical Society, and was also editor of the Wellington Botanical Society Bulletin (1985-1989). Since moving to Wanganui he has been an active member of the Wanganui Botanical Society, both as a committee member, and also helping run field trips, workshops and organising speakers. He was a member of the New Zealand Botanical Society Threatened Plant Committee (1993-1999), and its successor the Threatened Plant Panel, in 2001. Colin is still a first point of reference for any inquiry regarding the Threatened Plants of the Volcanic Plateau and Taranaki Region.

In making this nomination we wish to add that Colin Ogle continues to exert an important influence on the new generation of botanists - both within the Department of Conservation and outside it. Furthermore, he is a well-respected individual, widely recognised for his skills in scientific and internal peer-review, and a general stubbornness in making sure that any scientific publication within his sphere of influence is produced to the very highest quality imaginable."

Letters of support for the nomination were received from Peter Heenan, Patrick Brownsey, the Wellington Botanical Society, Audrey Eagle and Shannel Courtney.

Doug Rogan, c/- Canterbury Museum, Rolleston Avenue, Christchurch

Regional Botanical Society News

■ Auckland Botanical Society

June Meeting

Chris Ecroyd travelled up from Rotorua to speak to the society on the flora of the Rotorua thermal area. His presentation showed some of the unusual and unique plants to be found in this strange habitat.

June Trip

Big Muddy Creek, Huia, lived up to its name as our leader, Rhys Gardner, lead us around the edges of the mangroves in a quest to find a sedge that is very rare in Auckland, *Carex litorosa*. Although unsuccessful in this mission, some interesting plants were seen in the adjacent bush. Notable were tiny flowering plants of the orchid, *Corybas cheesemanii*. After lunch a visit to Little Muddy Creek revealed a dozen or so plants of the elusive sedge.

July Meeting

ASB member, Ross Beever, gave a beautifully illustrated presentation of the plants and fungi seen on a trip to the south-western region of Western Australia. Those present were introduced to a new acronym – YAP (Yet Another Pea).

July Trip

This, the society's third trip to Logues Bush, Tomarata, in 20 years, was as interesting and intriguing as the first visit. *Alseuosmia banksii*, at its southern limit here, was plentiful throughout the reserve, and both fruit and flowers were seen. *Pseudowintera axillaris*, thought to have died out, was found as two small plants, one of which was flowering, and a fallen branch which was covered with *Adelopetalum tuberculatum* (= *Bulbophyllum*), proved that this hard to locate orchid still lives on in the tree tops. Offers of a chocolate fish for the finding of black maire turned up three trees, and the fungi enthusiasts spied a brilliant patch of a vivid green toadstool, *Gliophorus viridis*. Three live kauri snails were added proof that this is indeed a very special reserve.

August Meeting

Jack Hobbs, Curator/Manager of the Auckland Regional Botanical Gardens, spoke on his visits to Yunnan and Sichuan Provinces in southwest China. His slides illustrated the plant life, landscapes and people of this region. The great variety of brightly coloured wildflowers found in the mountain areas contrasts with the generally white and yellow flowers found in similar habitats in New Zealand.

August Trip

The walk started in private bush at Houghton's Bush Camp, Muriwai, where there were large, spreading broadleaf trees with an occasional kauri tree growing amongst them, and a young understorey mainly consisting of nikau. After lunch the walk was through unfenced bush, and by contrast the understorey was mainly twiggy coprosmas, with plentiful *Coprosma crassifolia*. Consolidated dunes seem to be the main habitat for this species, as it is for *Corokia cotoneaster*. After reaching the small Lake Okaihau, a loop track returned to the camp.

FORTHCOMING ACTIVITIES

- 3 September Lucy Cranwell student lectures
- 20 September Onetangi Forest & Bird bush, Waiheke Island
- 1 October Lucy Cranwell Lecture, "Hooker & early NZ botanists" by David Galloway
- 18 October North Cove & Vivian Bay, Kawau Island
- 5 November "Three King's flora", by Ewen Cameron & Peter de Lange
- 15 November Karamatura Valley, Waitakere Range

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

■ **Manawatu Botanical Society**

5 April Sledge Track

The day before this track was officially opened by the Prime Minister, 10 botsocers spent a pleasant dry day composing an impressively long species list as they ambled along the new track. Following beside Kahuterawa Stream, above Black Bridge, the track ascends onto the ridge with a good lookout over the Kahuterawa Valley and the Ruahine Range. The long plant list shows what a diverse patch of scrub/ treefern/ riparian strip/ regenerating forest this is. One of the real treats was a patch of the tall moss *Dawsonia superba*, the only one known locally. Over time some of this diversity will disappear as tall forest establishes, but the prospect of such a stand in close proximity to Palmerston North more than makes up for this.

8 August Western Australian wildflowers – Mike Greenwood

Using 180 slides, Mike demonstrated the range of flowers and plants – their shapes, colours and the habitats they occur in – that are found in the south-west corner of Western Australia. Most weekends of their 17 month stay based at the University of Western Australia, Perth saw Mike and his family traipsing the ancient landscapes of low relief and poor soils that make up this incredibly floristically rich area. Most of the approx. 6500 species are confined to the area of winter rainfall, a region with one of the most reliable climates in Australia (and thus with a consistent yearly display of brilliant flowers). As well as rainfall, fire plays a major part in defining the vegetation. For example there are some fire weeds which germinate following fire, grow, flower, set seed and die and do not appear again until after the next fire. Mallee eucalypts, with many stems growing from a lignotuber just below the soil surface, when burnt, reshoot rapidly from the lignotuber.

The plant families Myrtaceae, Proteaceae and Fabaceae are well represented in the flora. For example, in the Myrtaceae there are 33 genera, several of which are endemic – eg *Calothamnus* (one-sided bottle brushes) with 24 spp and *Verticordia* (feather flowers) 50 spp. In the Fabaceae species of *Gastrolobium*, *Oxylobium* and a few other genera are poisonous owing to the presence of fluoracetic acid (1080). With such a wealth of flowering plants there is still one that stands out, the WA Christmas tree (*Nuytsia floribunda*), a semi-parasitic tree growing up to 13 m high and belonging to the Loranthaceae. Around Christmas time it produces masses of brilliant orange flowers and there are still some original forest giants left in the University of WA grounds.

Durslade Reserve

This 50 ha reserve part of a 70 ha property of the QEII National Trust, situated near Woodville, is dominated by 50 year old secondary kanuka forest on the south faces, and a mixture of kanuka and manuka on the north faces. There are significant scattered trees of *Hoheria sexstylosa* with some up to 8 m, while on the southern faces large areas of tree ferns, largely mamaku, occur. Some rewarewa and kamahi are starting to establish and seedling kahikatea and totara are appearing from bird distributed seed. Good sized patches of *Carex secta* occupy some of the wetter valley bottoms. While sparsely treed as yet, the reserve is sure to become increasingly important in the future. On the down

side, blackberry may well become a problem in some areas if left uncontrolled and goats and possums are still impacting on the vegetation.

PROGRAMME

Sat 4 October – Palmerston North urban area with Ullrich Asmus – weeds, lawns and waste areas.

Thursday 6 November – Leon Perrie on *Polystichum*

Sat 13 December – Waewaepa track in mixed scrub forest, Puketoi Range

Jill Rapson, Ecology, Institute of Natural Resources, Massey University.

■ Wellington Botanical Society

15 September	'Not enough water' – plants of deserts and other dry places – John Dawson
4 October	Waterfall Road Bush
18 October	Te Marua Workbee
20 October	Out of sight and out of mind – our disappearing indigenous freshwater plant communities – Vicki Froude
1 November	Carey Gully, Owhiro bay Catchment
17 November	Science Fair winner presentation; Onslow College Arboretum presentation
7 December	Maungapakeha Taipo, near Masterton

Wellington Botanical Society Summer Field Trip 31 Dec 2003 – 11 Jan 2003, West Coast and Murchison

31 Dec – 4 Jan, Kokiri Lodge, 8 km east of Stillwater, near Greymouth

6 Jan – 11 Jan, Mataki Lodge, Tutaki Valley, 33 km east of Murchison

Botanise West Coast Forests, Nelson Lakes National Park and Lake Matiri/Thousand Acres Plateau.

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.

<http://wellingtonbotsoc.wellington.net.nz/>

Web site includes forthcoming trips, meetings, articles, trip reports etc.

■ Nelson Botanical Society

Whangamoa River mouth, Sunday 18th May

An excellent turnout of 28 Nelson members assembled on private land close to the tidal estuary of the Whangamoa River. We negotiated the 4-wheel drive track through the gorse on foot and over the coastal headland out onto the Whangamoa sand spit. The gorse is acting as a wonderful nurse crop with mahoe, kanuka and tree ferns bursting through the canopy in places. Numerous ferns, including the regionally rare *Doodia australis* (ex *D. media*) lined the banks. In a small cove next to the spit we found a suite of typically open coast species such as *Peperomia urvilleana*, *Coprosma repens*, *Einadia triandra*, native iceplant and *Poa* aff. *cita* all growing on the steep, rocky slopes. This last species is unnamed because we have only recently realised that it is different from true silver tussock, especially in its rhizomatous rather than tussock-forming habit.

The spit dunes, although largely covered in marram, supported a healthy foredune population of köwhangatara (*Spinifex sericeus*) and a few healthy clumps of pīngao (*Desmoschoenus spiralis*) and sand sedge (*Carex pumila*). This is the only place in the Nelson City Council area where pīngao still naturally exists. After a pleasant lunch at the river mouth, we ambled around the estuarine stretch of the spit admiring the pinky-purple succulence of *Suaeda novae-zelandiae*, and great swathes of glasswort (*Sarcocornia quinqueflora*), in places bristling with the little estuary grass *Puccinellia stricta*. Along the upper strand zone, we also found a few plants of the native spinach (*Tetragonia tetragonoides*), looking rather depauperate compared with the typical vege garden form. Very rare along Nelson's coastline, it is on the nationally threatened plants list as "sparse". A quick look at the mouth of Toitoi Stream as it flows into the extensive estuary confirmed that the coastal shrub daisy *Olearia solandri* is in Nelson. As far as we know, this is its only Nelson location, here lining the banks with oioi, sea rush, sea sedge (*Carex litorosa*) and marsh ribbonwood.

To finish the day, we then headed for the small alluvial stand of coastal forest at the Whangamoa River delta just back from the estuary. Coastal alluvial forest is almost extinct in Nelson province, and despite its sadly degraded state due to infestation by old-man's-beard and wandering willie, canopy collapse, and grazing, this stands regional importance was highlighted to us by the old stands of pukatea and a ground cover in places of the regionally rare ferns *Arthropteris tenella*, *Lastreopsis microsora* subsp. *pentangularis* and *Diplazium australe*. The discovery of leafless bush lawyer (*Rubus squarrosus*), more typical of the eastern South Island, was also a very unexpected find here. *Coprosma areolata*, obviously browse-tolerant, was almost the sole understorey shrub species.

Shannel Courtney

John Slow's native plant collection, Sunday July 20th.

A crisp sunny winter day invited 19 people to explore John Slow's impressive collection of native plants on his Moutere Gravel property situated on the Richmond foothills. He started planting in 1980, with many species from the North Island, offshore islands, and the Kermadecs. Large specimens of *Nothofagus* species and *Vitex lucens* towered above *Pittosporum umbellatum*, with its many-flowered umbels, *Pittosporum pimelioides*, *Toronia toru* (= *Persoonia toru*), *Alseuosmia macrophylla*, and *Fuchsia perscandens*. John's collection of *Pomaderris* species (from tree-shape to prostrate) will very soon open their buds in great profusion. His 20-year-old *Rhopalostylis sapida* was showing its first fruiting spike. *Rubus squarrosus* was climbing into the canopy, and near the pond, *Rubus parvus* covered the ground. From the Kermadec Islands was *Boehmeria dealbata* (Urticaceae, the nettle family), and from the Three Kings Islands, *Tecomanthe speciosa*, which was growing vigorously. *Ackama rosifolia* with its pinnate serrated leaves was well below its natural southern limit of Dargaville. Lunch was at a sunny site with a view and a superb specimen of *Melicytus alpinus* with a trunk diameter of 60 mm! Many thanks to John for a very rewarding and interesting day, which allowed some of us a close-up look at species we had never seen before.

Liselotte Seckler

FUTURE TRIPS

21 September	Pelorus River, Leader Melanie Newfield, 548 9489
19 October	Rawhiti Cave/Gorge Creek, Golden Bay, Leader Shannel Courtney, 546 9922
16 November	Wangapeka, Leader Rob Landau, 522 4472

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

August Meeting

Steve Wagstaff spoke about his and Juliet Wege's research on the NZ trigger plants (Stylidiaceae). Three of the five genera in the family are found in NZ – *Forstera*, *Phyllachne*, and *Oreostylidium*, but most of the species are found in Australia in the genera *Stylium* and *Levenhookia*. A central floral column, bearing the stigma and anthers at the apex, is, in most species, held under tension and is explosively released when an insect probing for nectar visits a flower. Although species differ tremendously in the size, shape and colour of their flowers, generally the Australian species have colourful flowers and the New Zealand species white flowers.

Steve and Juliet compared the DNA sequences of trigger plants to determine the origin and diversification of the New Zealand species. The results suggested two distinct lineages arriving in New Zealand at different times, the first containing all the species of *Forstera* and *Phyllachne* and the other solely of *Oreostylidium*. With relatives of the first two species in Tasmania and South America the origin of New Zealand *Forstera* and *Phyllachne* is not clear; on the other hand *Oreostylidium* clearly has an Australian origin but, with its limited species diversity and scattered distribution, has not achieved the same success as the other two genera.

August Field Trip

Ten members visited the restoration projects in and around Bowenvale Valley on the Port Hills with Di Carter, Port Hills Ranger. Looking down from the top of the valley Di explained how the two blocks of pine forest demolished by the big storm in October 2000 have been logged and replanting with native trees and shrubs has begun. A total of 19,000 native plants have gone in over the last two years. Bush Head and Hidden Valley feed into Bowenvale and both have small remnants of original podocarp/hardwood forest. Restoration planting begun 12 years ago in these fenced off remnants is

beginning to emerge through the cocksfoot and with recent and future plantings complete forest connections will be made between the summit ridge and the valley floor. These areas will also link with existing remnants on the Lyttelton Harbour side of the Port Hills. We then went on to look at the weeds of the area, such as old mans beard and seed dispersed cotoneaster and holly, which will need to be managed to maintain the natural values of the existing remnants and restored areas.

FORTHCOMING ACTIVITIES

5 September	Treelines and tree-grass interactions in Western Canada – Duana Peltzer, Landcare Research, Lincoln
6 September	Field trip to Saltwater Creek. Leader: Trevor Partridge
3 October	Jon Sullivan talking on the botany of Costa Rica
4 October	Alford Forest, Leader: Warren Jowett
7-9 November	SPRING CAMP: Ryton Lodge, Rakaia River near Lake Coleridge. Different grades of accommodation are available. There are wonderful places to botanise near here including Mt Olympus for alpine plants.
6 December	Short talk by a student and talk by Fayla Schwartz from the USA
7 December	Fog Peak, Porters Pass

President: Neil OBrien (03) 384 6090 obrien.nj@xtra.co.nz

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

■ Botanical Society of Otago

(Trip and Meeting Reports summarised by the Editor from BSO Newsletters #38 and #39. Unless noted all reports were written by Allison Knight)

Meeting – 28 May

Dr Steve L Stephenson, Fairmont State College, USA, talked to a convivial gathering on *Special microhabitats for myxomycetes in terrestrial ecosystems* and entertained us with a slide show on the special places slime moulds occur from arctic tundra to tropical forests. The microscopic fruiting bodies of myxomycetes are exquisitely colourful when magnified on a projector screen.

Meeting – 4 June

Barbara Wheeler, Collections Supervisor, Dunedin Botanic Garden illustrated her topic of *Israel – Land of Extremes* with some interesting slides and observations from her recent visit.

Solander meeting- 23 July

Dr Ted Nye, Otago Scandinavian Club, spoke to a full house on “*Solander, the first professional botanist to visit New Zealand*”. He began his talk with an upright cardboard file box, with an open front and sloping sides, correctly called a Solander box, after the Swedish botanist who invented it while he was working at the British Museum over 200 years ago. Then he regaled us with all manner of interesting details of Solander’s life. His father was a priest and a schoolteacher, so young Solander would have grown up with a good background in Latin, which he put to good use as a pupil of Linnaeus at Uppsala University.

From Uppsala Ted led us to Britain, where Solander spread Linnaeus’ hierarchical system of binomial classification, possibly indulged in a little industrial espionage for Sweden, and was in demand for classifying private collections, such as that of Hans Sloane, whose collection formed the basis of the British Museum. He soon came to the notice of Joseph Banks, who encouraged Solander to come as naturalist on Captain Cook’s expedition in the Endeavour to observe the transit of Venus and explore the southern continents. Banks and Solander developed an enthusiastic partnership which led to the discovery of hundreds of new plant species in Tahiti, New Zealand and Australia. Banks turned down a chance to come on Cook’s second Pacific expedition and, with Solander, mounted an expedition to Iceland instead, which was not nearly so botanically interesting. On their return to London Solander became Keeper of Natural History at the British Museum. He was reluctant to let Linnaeus see any of his specimens, and died of a cerebral haemorrhage at the age of 49.

Solander was the first professional botanist to collect and describe New Zealand plant species, either on his own, or in collaboration with Banks. Cheeseman (1925) lists about 35 New Zealand species so

described. In addition, taxonomists honoured Solander by giving plants the epithet 'solandri', as in *Astelia solandri*.

Lichens on twigs workshop – 26 July

Like last year's lichen workshop, Lichens on Twigs, was a great success. Under the able guidance of Jennifer Bannister and Alison Knight I was taken through the many steps involved with lichen identification. Lichen keys are not for the uninitiated and I appreciated not only the facilitators' expertise, but also having on hand glossaries, websites, keys and reference books. And thanks to the Department of Botany for letting us use their excellent laboratory facilities.

Robyn Bridges

Orokonui Reserve – August 9

Local botanist Dr. Ralph Allen, who, as a member of the Dunedin Natural History Trust, is currently working to establish a mainland island reserve at Orokonui north of Dunedin, led a group of 20 interested members around the reserve. The plan for Orokonui will follow the example of Karori mainland island reserve in Wellington. Apart from the conservation of endangered species, a major goal of the reserve is to act as an advocacy tool to raise public awareness. The hope is that once people have experienced first hand exactly what we risk losing, they will be inspired to give the conservation of the nation's biodiversity more serious consideration. As part of this advocacy role the Dunedin Natural History Trust hopes to offer a range of eco-tourism options including both independent and guided walks through the reserve, and will provide education opportunities for school and other groups.

Orokonui was chosen as the site of the mainland island reserve, in part, for the value of its vegetation. The reserve covers an area of 270 ha, encompassing a range of habitats. It contains large areas of kanuka forest-scrub, varying in age from 70-120 years. Within the kanuka stands, typical secondary forest species such as lancewood, broadleaf and red mapou (*Myrsine australis*) are establishing, with the occasional occurrence of young miro and Cunningham's totara (*Podocarpus cunninghamii*) giving evidence of the potential for succession to mixed podocarp-broadleaved forest. A feature of the reserve is a gully that has apparently escaped burning. Here are found a number of large rimu, miro, Cunningham's totara, and at least one matai (*Prumnopitys taxifolia*). There is an abundance of tree ferns and areas of well-developed broadleaved forest containing kotukutuku (*Fuchsia excorticata*), broadleaf, and tarata (*Pittosporum eugenioides*). The reserve extends to Orokonui lagoon, containing a reasonable area of valley floor. The trust hopes that this area will be suitable for the development of alluvial forest containing kahikatea (*Dacrycarpus dacrydioides*), totara, matai, manatu (*Plagianthus regius*) and lacebark (*Hoheria* sp.), since lowland alluvial forest is almost extinct on the east coast of the South Island. A mountain ash (*Eucalyptus regnans*), thought to be New Zealand's tallest tree at 69.1 m, is currently inside the boundary of the reserve, standing with others of similar height within a small plantation planted in the grounds of the old Orokonui Psychiatric Hospital.

Norman Mason

PROGRAMME

24 September	"An introduction to New Zealand gecko and plant associations" Guest speaker Mandy Tocher.
27 September	Field trip to Warrington and Seacliff.
11 October	Donaldsons' Garden & Moores Bush
29 October	2nd annual Geoff Baylis Lecture, Distinguished guest speaker Dr Peter Wardle "New Zealand's forest limits and the vegetation above them, compared with South America and other regions".
5 November	Monica Peters "Living off the land (sort of) in Mongolia 2001-2002" Images of Mongolia – a land in transition.
8 November	Full day field trip to Nugget Point and Cannibal Bay led by John Barkla.
6 December	Mt Watkin podocarp forest (sheltered forests in the gullies at the base of Mt Watkin). Trip leader: Ralf Ohlemüller.

Secretary: Robyn Bridges, robyn.bridges@stonebow.otago.ac.nz, ph 479 8244

P.O. Box 6214, Dunedin North.

<http://www.botany.otago.ac.nz/bso/>

Web site includes trip details, membership forms, contact details and links to other websites of Botanical interest.

■ Other Botanic Society Contacts

Rotorua Botanical Society

President: Willie Shaw 07 362 4315
Secretary: John Hobbs 07 348 6620
3020, Rotorua. c/- The Herbarium, Forest Research, Private Bag
See also www.wildland.co.nz/botanical.htm

Wakatipu Botanical Group

Chairman: Neill Simpson (03) 442 2035
Secretary: Lyn Clendon (03) 442 3153

Waikato Botanical Society

President: Bruce Clarkson b.clarkson@waikato.ac.nz
Secretary: Karen Denyer Karen.Denyer@ew.govt.nz c/- Department of Biological Sciences,
University of Waikato, Private Bag 3105, Hamilton.

Wanganui Museum Botanical Group

Chairman: Ian Bell (06) 343 7686 115 Mt View Road, Wanganui
Secretary: Robyn Ogle (06) 347 8547 22 Forres Street, Wanganui

WANTED TO BUY

A full or partial set of NZ Journal of Botany. Any condition considered.
Contact Dr Mark Horrocks, 31 Mont Le Grand Rd, Mt Eden, Auckland.
Ph: (09) 630 5787. Email: m.horrocks@auckland.ac.nz

NOTES AND REPORTS

Research Reports

■ *Cotoneaster pannosus* as an adventive plant in New Zealand

C C Ogle 22 Forres St., Wanganui and W R Sykes Research Associate, Landcare Research, Lincoln.

Previous records of *Cotoneaster pannosus* in NZ

Based upon a wild collection from Auckland, *Cotoneaster pannosus* appeared as a minor or zeta entry on p. 1070 of Volume 4 of the *Flora of New Zealand* (Sykes in Webb et al. 1988). Some differences between *C. pannosus* and the superficially similar *C. franchetii* were given in the dichotomous key that preceded that entry. The synopsis to the genus also showed that *C. pannosus* and *C. franchetii* occur in separate sections of *Cotoneaster*, namely Section *Chaenopetalum* and Section *Cotoneaster*, respectively.

Additional adventive occurrences of *C. pannosus* were cited in Heenan et al. (1999) from Russell in Bay of Islands in 1988 and from the Port Hills, Canterbury in 1997, where plants were stated to be spontaneously regenerating in the vicinity of planted specimens. A further site, found in 2000 on the site of a disused school on Island Block Road, Mercer, Waikato, was cited by Heenan et al. (2002).

New records

In 2002-03, one of us (CCO) found numerous flowering shrubs, both planted and wild around Durie Hill, Wanganui that resembled *C. franchetii* but differed in their flowers having white spreading petals. The first collection (possibly a planted shrub – CHR565458) was identified by WRS as *C. pannosus*, which led to a city-wide search for both *C. pannosus* and *C. franchetii* in different seasons. Distinguishing the two species proved difficult at first, especially when the shrubs lacked flowers. By reference to *Cotoneaster* species descriptions (Lu Lingdi & Brach, pp. 85-95 2003; Bean, 1970) and massed collections from flowering and fruiting shrubs around Wanganui, a set of characters was selected that enabled seedlings to be identified as well. These are shown in Table 1. In May 2003, 17 fruiting wild plants were collected in three separate parts of Wanganui city. Eleven proved to be *C.*

pannosus and six were *C. franchetii*; these are deposited in CHR. Seedlings of both taxa were found also on roadside banks and in urban gardens. Specimens of *C. pannosus* in AK come from Russell (1988) and Waikumete cemetery in Auckland (1987, 1988, 1997). There is also an AK collection of *C. franchetii* from the latter site in 1988. At least in Auckland and Wanganui, *C. franchetii* and *C. pannosus* are known to grow together.

Discussion

Not only does *C. pannosus* appear to be more common as an adventive plant in New Zealand than has been recognised before, but reference to herbarium specimens and literature shows it has sometimes been confused in the past with *C. franchetii*, both here and overseas. For the British Isles, Bean (1970) mentions that the two species are unrelated but often confused. However, the distinguishing features that he provides do not include the number of pyrenes in the fruit and the lengths given for the petiole, lamina and fruit are unreliable. In addition, we believe that Bean's (1970) descriptions of fruit shapes and the colours of the leaf surfaces and fruits could be improved. Thus Bean (1970, p.741) recognised similarities between these two unrelated species and attempted to distinguish them but, apart from the petals, the characters mentioned are too imprecise to be of much use. The key to *Cotoneaster* species in Webb et al. (1988) is cumbersome and, despite the distinctiveness of *C. pannosus* and *C. franchetii*, the user could go astray, especially since the two species have leaves of similar size and indumentum. Species in the two sections of *Cotoneaster* are not keyed together and, importantly, the very useful pyrene number is omitted. Although *C. pannosus* has just two pyrenes per fruit (Lu Lingdi & Brach, 2003), it was stated to be 2-5 by Starr et al. (2003). A coloured photograph labelled as *C. franchetii* in Roy et al. (p. 234, 1998) shows flowers with white spreading petals; it is clearly *C. pannosus*.

Although the relative weediness of the two species has not been assessed in New Zealand, we suggest that it is probably just a matter of time before *C. pannosus* spreads more widely. Seedlings can be as common as those of *C. franchetii* where both species grow together. In weediness, *C. pannosus* may resemble *C. lacteus*, stated in Webb et al. (1988) to be mainly an urban weed, but which is now spreading rapidly into rural areas and is at least as common as the superficially similar *C. glaucophyllus* in some places.

Overseas, *C. pannosus* is recorded as a pest in Hawai'i, California, and Australia (Starr et al. 2003). In Hawai'i, it can form thickets along roads and pastures, in woodlands and shrublands, and in both disturbed and natural plant communities. It is recorded as preferring cooler climates and is believed to pose the greatest risk to native mid-elevation shrubland and mesic forests where plants can form large stands (Starr et al. 2003).

Conclusions

Cotoneaster pannosus has been misidentified at times in New Zealand as *C. franchetii* in herbaria and the literature and is probably often mistaken for the latter species in the field. Distinguishing characters given in some authorities have proved unhelpful or, at times, quite incorrect. It is locally common as an adventive species, with current records from urban areas only although overseas experiences suggest that it is potentially quite invasive. The superficially similar *C. franchetii* occurs in urban and rural areas.

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Table 1: Field differences between *Cotoneaster franchetii* and *C. pannosus* in New Zealand

FEATURES	<i>Cotoneaster franchetii</i>	<i>Cotoneaster pannosus</i>
Shrub form	Branchlets arching	Branchlets erect to spreading
Leafy stems	Bark grey to brown, new growth white-pubescent	Bark red-purple, any pubescence short-lived
Foliage		
Upper (adaxial) surfaces	Mid-green, shiny, thinly pubescent when young; mid- and lateral veins obvious and impressed	Olive-green, barely shiny, hardly or not pubescent, mid-vein impressed but lateral veins obscure and not impressed, especially in young leaves
Lower (abaxial) surfaces	Rather thin tomentum, green-white, veins raised, 3 - 5 pairs/leaf	Dense tomentum, white, veins slightly raised, (4) - 5 - 7 pairs/leaf
Inflorescence	5-11 flowered corymb	10... (20) flowered corymb
Flowers		
Corolla	5 erect pink petals	5 spreading white petals
Fruit		
Shape, size, colour	Obovoid or oblong-obvoid; orange-scarlet to scarlet	Sub-globose, deep or dark crimson
Pyrenes	Mostly 3 (up to 5) per fruit	Almost always 2 per fruit (sometimes 1 aborted)

■ The *Crassula tetramera* complex in New Zealand

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Crassula tetramera (Toelken) A.Druce et Sykes was initially described from the northern territory of Australia as a subspecies of *C. sieberiana* (Toelken 1981). Of it Toelken noted that it is essentially a desert plant, with a generally decumbent annual habit (Toelken 1981, 2002). At the time Toelken included other more southerly and/or coastal Australian annual crassulas with an erect and/or erect-branched habit within his circumscription of *Crassula sieberiana* subsp. *tetramera*, observing that these forms diverged from the type and appeared to intergrade with *C. sieberiana* subsp. *sieberiana* in some inland parts of Australia.

Crassula sieberiana subsp. *tetramera* was subsequently admitted to the New Zealand flora by Druce & Sykes (1987), who also furnished the plant with a new combination at the rank of species (*C. tetramera*). They recognised *C. tetramera* as an erect to erect sparingly branched annual species of northern North Island offshore islands and from the drier, easterly portions of the country, especially Marlborough, Canterbury, and Otago. Later de Lange & Cameron (1999) questioned the status of *C. tetramera* in New Zealand, observing that cultivated specimens of New Zealand "C. tetramera" from some northern offshore islands, and the scoria fields of the Auckland region, behaved as perennials, and soon lost their erect branched habit, developing instead, the decumbent habit of *C. sieberiana*.

These authors also suggested that *C. tetramera*, being based on a desert collection from northern Australia was unlikely to be in New Zealand, and so they refrained from using that name in their treatment of the vascular flora of Aorangi Island, Poor Knights, choosing to refer northerly specimens of the erect, apparently annual crassula to *C. sieberiana*.

Later field work by the author in New South Wales and Victoria, (the latter in the company of Hellmut Toelken), provided an excellent opportunity to revisit the status of *C. tetramera* within New Zealand. Certainly field work in these Australian states revealed that identical (or near identical) examples of the erect, often branched, wine-red, pedunculate flowered plants familiar to New Zealand botanists as "*C. tetramera*" were widespread and seemed to form uniform, true breeding populations. However, despite their similarity to New Zealand plants, I was assured (Toelken *pers. comm.*) that none of these plants were *C. tetramera*.

Subsequently a revision of the *C. tetramera* complex has been published (Toelken 2002) and this revision though primarily intended to resolve the Australian complex, helps to resolve the New Zealand situation as well.

It is now clear that *C. tetramera* is not present in New Zealand. This species (Toelken having accepted it at species rank) is a desert annual distinguished from other allied annual crassulas by its decumbent habit, fruiting calyx 0.6-0.9(-1.1) mm, with thick, fleshy, spreading lobes (usually without a membranous margin), hypo- and epicotyl (lowest two internodes) scarcely elongated, and by the **smooth to shiny seeds** which are scarcely puckered around the attachment.

The other erect, scarcely branched or branched forms previously attributed to *C. tetramera* in Australia and New Zealand are now recognised as *C. colligata* Toelken (subsp. *colligata*, subsp. *lamprosperma* Toelken) and *C. extrorsa* Toelken. Hybrids between these taxa (readily identified by features of the fruiting follicles and seeds) and *C. tetramera* are also recognised, accounting for much of the gradation previously discussed by Toelken.

Of these new taxa, only *C. colligata* Toelken subsp. *colligata* is recognised for New Zealand, though as the treatment is essentially an Australian based revision little is said about it, and specimens are not cited. Nevertheless, from my perusal of specimens held at AK, *C. colligata* is readily identifiable as the widespread taxon previously treated by Druce & Sykes (1987) and most subsequent New Zealand workers as *C. tetramera*. *C. colligata* can be separated from New Zealand specimens of *C. sieberiana* by its erect, branched habit, pedunculate flowers, pyramidal fruiting calyx (the calyx about twice the length of the corolla lobes and follicles), recurved fruiting follicles, and prominently ridged, rugose-colliculate seeds (an excellent example of the seed of *C. colligata* is depicted, as *C. tetramera*, Plate 6, p.176, in Webb & Simpson 2001). I can also add that in comparison to Australian specimens, New Zealand specimens of *C. colligata* are less woody and the leaf tips are never as pungent or hardened as the Australian examples of this taxon I have gathered (AK!).

Although this revision goes somewhat to resolving the status of New Zealand plants previously referred to as *C. tetramera*, there are still some problems. Notably, as observed by de Lange & Cameron (1999), Auckland lava field and Poor Knights specimens of *C. colligata* are apparently unstable, behaving in cultivation as perennials, and generally losing their erect habit in favour of a semi-erect to decumbent growth form. In contrast, as observed by Sykes (in de Lange & Cameron 1999), Canterbury specimens of "*C. tetramera*" (*C. colligata*) are quite stable, and in cultivation retain their annual habit and distinguishing morphological characters. From these observations I suspect that at least some of the instability of the North Island plants I have cultivated can be attributed to hybridism between *C. colligata* and *C. sieberiana*. Certainly Webb & Simpson (2001) illustrate two examples of seed variations in *C. sieberiana*, one smooth and the other somewhat rugose, and, if the situation in New Zealand is anything like that documented for the Australian *C. tetramera* complex by Toelken (2002) then it is very likely that these rugose-seeded variants are hybrids.

Toward that end, and as chromosome counts of other New Zealand *Crassula* species have proved very informative (Murray & de Lange 1999; P. J. de Lange unpubl. data), I have tried to count the chromosomes of New Zealand specimens of *C. sieberiana* and *C. colligata* to determine whether hybrids between both taxa are likely, and if so what their chromosome compliment might be. I regret to say that so far my attempts have proved unsuccessful. Obtaining mitotic counts from the annual New Zealand *Crassula* species is extremely difficult, being hampered by their very short life cycles,

rather fine roots, and low mitotic index. Similarly attempts at obtaining meiotic counts from suitable tissue have so far failed through the sheer frustration of trying to separate developing anthers from the minuscule flowers – something I suggest would try even the patience of a Saint!

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■ *Aster subulatus* (sea aster) in the South Island

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Sea aster was first recorded in New Zealand by Kirk (1896:503-4) (as *A. imbricatus* Walp.) from a ballast heap at Wellington, but it did not persist. It was next recorded by Carse (1916:242) (as *A. subulatus*) from Manganui, North Auckland; it spread through the Auckland Province and by the 1940's had reached Hawkes Bay. By the 1960's it was present in Taranaki, Wanganui, Manawatu, the Kapiti Coast, Hutt Valley, and Wellington.

It was first found in the South Island on untended land on a reclamation near the then new cargo ferry berth at Picton, Marlborough (CHR 234741 A, B, C : CHR 234 744 - all material from AJH74/115, 17 August, 1974, showing different morphological features). The species was not observed when this site was examined in 1968, and possibly reached the area on road transport vehicles or other dispersal agents carried on the inter-island ferries (Healy 1981:41).

As it can prove a troublesome plant with its wide habitat tolerance - salt marshes, poorly drained places and waste land generally; my intention was to prevent it establishing and spreading along roadside drainage channels, and possibly reaching the saline areas about the solar salt works at Lake Grassmere, south of Seddon.

The Ministry of Agriculture and Marlborough County Council were alerted to the arrival of the plant in the district and the need for its prompt eradication. Control measures were initiated but were not sustained and the plant spread over the reclamation and in waste places about Picton Borough. It was later reported from Blenheim by Webb, Sykes and Garnock-Jones (1988:181).

I made representations again to the Marlborough County Council and the Noxious Plants Council, and the plant was given legal status, being gazetted a Class B Noxious Plant under provisions of the Noxious Plants Act 1978 (*NZ Gazette* 1980:3277) within the boundaries of the Marlborough District Noxious Plants Authority. The Noxious Plants Act 1978 was revoked with passage of the Biosecurity Act 1993 with relevant sections dealing with noxious plants valid until 30 June 1996. Sea aster is not included in a recent Marlborough District Council listing of plant pests (A.R. Besley 2001:30 - 67).

Aster subulatus was next found on the site of the recently abandoned Addington Railway Workshops, Christchurch (CHR 413976 A, B : AJH 94/91, 25 February 1994) when eleven plants were detected over land some 14 hectares in extent, covered with broken bricks, bulldozed concrete, smashed timber, and broken glass. This block has been kept under observation until mid 2002, but with time, bulldozing and other activities of the Ngai Tahu owners it has become progressively inhospitable for

volunteer plant growth. Over the period 1994 – 2001, some 532 plants of sea aster were eradicated (1994 – 241 plants, 1995 – 25, 1996 – 103, 1997 – 47, 1998 – 4, 1999 – 112).

A discrete colony of three plants (two in flower) was found in a shingle car park of a new joinery factory at Belfast, 10km north of Christchurch (CHR 413978 A, B, AJH 94/72, 28 March 1994). This site has been checked periodically until early 2002, with negative results.

A third occurrence was found on the recently vacated (late 1997) Canterbury Sale Yards, Addington, an area of 6.02 hectares where farm livestock from throughout the province and the Chatham Islands had been sold since 1874 (Studholme, 1975) Removal of some of the yard pavings - shingle, concrete, bricks, Hoon Hay and Halswell stone, exposed a compacted soil with high nitrogen content and some animal-dispersed fruits and seeds ready to colonize the area. Incidentally, more than 170 tonnes of the Hoon Hay and Halswell stones have been salvaged for use in a columbarium being build at Christchurch Cathedral (Scanlon, : 2000).

After 18 months a wide range of volunteer plants appeared, including indigenes with animal-dispersed fruits, including species of *Acaena*, *Carex*, *Cordyline*, *Dichelachne*, *Elymus*, *Juncus*, *Lachnagrostis*, *Poa*, *Rytidosperma*, *Solanum*, and *Urtica ferox*, and wind-dispersed species from adjacent land. A single plant only of *Aster subulatus* was found over the whole block (CHR 563465 AJH 98/84, 7 Dec. 1998) initially, but by March 2000 there was an abundance of sea aster plants to 2m. tall over the whole area in a tall dense mixed community of *Conyza albida*, *C bonariensis*, *Lactuca serriola* var *integrata* and *Senecio (Erechtites)* spp. In April 2002, a single plant only of sea aster was observed.

The origin of the sale yards occurrence is not certain, but it is possible that fruits were carried on a westerly wind from the earlier mentioned infestation on the old Addington Railway Workshop site, prior to my eradication efforts.

Untended land adjacent to Railway Workshops and Sale Yards sites has been checked, but no sea aster plants have been detected. On the other hand, I have been responsible for plants appearing on my domestic section in Riccarton, 11.50km distant from the workshops site. A specimen in fruit brought home to photograph in February 1994, putting specimens into a plant press, and possible fruits on damp boots have been responsible for volunteer plants in vegetable and flower garden over the years (CHR 499632, AJH 95/38, 20 Feb. 1995 - in shallot bed : CHR 509581, AJH 95/184, 28 Nov. 1995 - in base of Clematis climber).

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■ Kauri regeneration south of the species' natural range

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Abstract

Agathis australis (D.Don) Lindl. (kauri) seedlings originating from planted trees have been found in New Plymouth (latitude 39°00'S) and in Wellington (latitude 41°01'S). These sites are 120 and 365 km south of the natural range of the species in New Zealand. This is the first record of persistent reproduction of kauri from trees planted outside the currently-accepted natural range. The Forest Research Herbarium in Rotorua holds seedlings representative of the regeneration from both sites.

Introduction

The natural range of kauri is regarded as the warm, temperate, northern part of New Zealand bounded by the latitudes 34 to 38°S (Sando 1936). Kauri is now most abundant on the peninsulas of Northland and Coromandel (Ecroyd 1982). It was present well south of its current distribution as late as 300 000 years BP (Mildenhall 1986). Although it was uncommon in its present habitat during the mild moist conditions of early postglacial periods, it became prominent during 7000-3000 BP in the southernmost part of its range (Ogden et al. 1993).

Kauri produces wind-dispersed, small-winged seeds (Hutchins 1919) that germinate in autumn soon after dispersal and lose viability after only a few months on the forest floor (Whitmore 1977). Dispersal is usually limited to distances up to 150 m from the parent tree, but instances up to 1.5 km have been recorded (Mirams 1957). Bielecki (1959) and Barton (1982) described small seedlings as shade tolerant, but saplings and young trees require full overhead light for vigorous growth. Although tolerant of a wide range of soils, kauri appears to compete best with broadleaved species on infertile sites and ridges (Silvester 2000). Natural stands tend to establish beneath shrub cover such as manuka (*Leptospermum scoparium*) and kanuka (*Kunzea ericoides*) on previously disturbed sites (Beveridge 1975). Female cones develop on planted trees as young as 6 years old (G.A.Steward unpubl. data). Within and outside the natural limit, trees produce viable seed at between 25 and 40 years of age (Halkett 1983). Ecroyd (1982) reported seed on 15-year-old trees. In spite of many years of kauri planting, no instance of persistent regeneration arising from trees planted outside the natural distribution area has previously been recorded.

Observations

Regenerated seedlings found at New Plymouth and Wellington were all growing within 1-5 m of semi-mature kauri trees. The habit of the root systems of the seedlings collected for herbarium specimens matched descriptions of natural seedling roots (Ecroyd 1982). There was no sign of distortion or taproot pruning, which is a feature of nursery-grown stock, even some considerable time after planting. The range of root collar diameters was 2.8-3.5 mm in New Plymouth seedlings and 1.0-3.0 mm in the Wellington seedlings. Seedling age was estimated to be 5-7 yr (New Plymouth) and 1-3 yr (Wellington). At both sites the largest seedlings were considered to be well-established since the taproots had penetrated more than 10 cm into the mineral soil below the litter layers. (A detailed description of sites can be found in Steward et al. 2003).

Climate Considerations

Lowlands within the natural range of kauri generally have warm summers and mild winters with well-distributed rainfall and a mean annual temperature of 13-16°C. Frosts are rare. Meteorological conditions at the New Plymouth and Wellington sites are within the limits observed for the area occupied by natural stands and individuals and there is thus no obvious climatic barrier to kauri regeneration if a viable seed source is present. Conditions that allow or support kauri regeneration (Bielecki 1959; Barton 1982) clearly exist locally in regions outside the area regarded as the natural range.

Discussion

Viable kauri seed has probably been produced at both the New Plymouth and the Wellington sites for at least 28 years, and possibly for as long as 43 years. While there have been a considerable number of anecdotal reports from these sites of prior germination beneath planted kauri, high seedling mortality rates can be expected. McKinnon (1945) reported mortality in excess of 93% in a natural stand where there was a deep kauri litter layer penetrated by mature root systems. Here competition for moisture or other resources may have limited seedling survival.

An explanation for the recent appearance of these seedlings in these stands may be found in an analysis of climate data for New Plymouth and Wellington (NIWA 1994-2000) which shows a moderate increment in mean annual temperature at each site for the years presumed to cover the period of seed initiation, seedfall, germination, and early seedling development. At New Plymouth during the period 1994-96 the mean annual temperature rose by 0.14°C to 13.64°C. At Wellington during the period 1996-2000 the mean annual temperature rose by 0.54°C to 13.14°C. While a number of factors are likely to influence the successful germination and development of kauri seedlings, if the suggested trend towards global warming is real the extent of the area in which this species will reproduce is likely to increase.

After the initial finds of kauri regeneration from planted stands in New Plymouth and Wellington a number of other anecdotal reports were investigated in Wellington and Rotorua. The report of regeneration at Rotorua was the only incident where the seedling remained in situ. No attempt was made to disturb the Rotorua seedling to verify its authenticity; however, the anecdotal evidence is reliable and accepted.

Currently there is enthusiastic support for planting kauri and other native trees for varying reasons including cultural, environmental, and heritage reasons, as well as for potential timber production, etc. The existence of seedlings originating from kauri planted outside the natural range of the species extends the potential for managing kauri regeneration for a range of outcomes in the future.

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Herbarium Reports

■ Auckland Museum Herbarium (AK) report: 1 July 2002 to 30 June 2003

The biggest achievement for the year was changing from the botany AKILLIES database to the Museum-wide Vernon Collection System. The botany database was frozen in November and by February we were operating on the new system. Fine-tuning is still continuing.

The University herbarium (AKU) was formally donated to the Museum on 2 Sep 2002. The gift includes the V.W. Lindauer herbarium of marine algae which had been on long-term loan to the Museum. The gift of nearly 53,000 specimens swells the AK herbarium to over 315,000. The collection will require an outside funding source before it can be databased and physically incorporated into AK, although most of the vascular plant specimens were already databased and they have been transferred (20,500 specimens) onto the Museum's Vernon system and given new AK numbers.

The year was completed with 2640 backlog herbarium specimens being identified and databased by the three contract workers (Francis Duff, Rhys Gardner and Emma Trembath) employed for seven weeks funded by the Museum. This resulted in 80 boxes of databased and labelled specimens now waiting to be mounted by volunteers.

Lottery Board Grants

Tim Martin funded by a lottery grant completed databasing the remainder of the backlog cultivated New Zealand specimens (nearly 3,000). Because of other commitments and the database change-over, John Braggins only worked part-time from Jul-Dec identifying and databasing his gifted liverwort collection, adding 977 specimens; 42% of this grant is still unspent.

Fieldwork/Research

In November Mei Nee Lee joined a 3-day NIWA research trip studying algae on the Kaikoura coast. Led by Wendy Nelson this was a wonderful opportunity for Mei Nee to learn some marine algae in the field. Ewen Cameron joined the Museum entomology staff on a 4-day trip in November to Great Barrier Island to survey 3 small islands off the SE coast. Ewen also visited the Three Kings Islands in March as part of a Landcare Research / Department of Conservation 6-day trip to remeasure the 3 permanent forest quadrats established in 1946. Herbarium staff published 24 articles; several were coauthored with Department of Conservation or Landcare Research staff, and covered weeds, native plants, new species descriptions, natural areas, obituaries and book reviews.

Acquisitions and donated specimens

Staff collecting numbers totalled: 630 by Ewen Cameron and 163 by Rhys Gardner. Specimens were also received from: Tricia Aspin, Jessica and Ross Beever, Steve Benham, Paul Champion, Gillian Crowcroft, Pat Enright, Graeme Jane, Cameron Kilgour, Peter de Lange, Lisa Forester, Steve McCraith, Colin Ogle, Barbara Parris, Graeme Platt, Matt Renner, Nick Singers, Bec Stanley, Graeme Taylor, Mike Wilcox, George Wilson, Anthony Wright, Shane Wright, Maureen Young and Biosecurity Officers of Auckland and Northland Regional Councils.

Staff

Curator	Ewen K. Cameron
Honorary Research Associate	Rhys O. Gardner
Technician	Mei Nee Lee
Contract staff	John Braggins (part-time); Tim Martin (Jul-Oct); Emma Trembath, Rhys Gardner & Francis Duff (May-Jun)

Volunteers

Our regular volunteers Chris Ashton, Joan Dow, Wendy Patterson and Meryl Wright worked the full year; Kay Haslett had a 6-month break after hip surgery. After a minor recruitment drive several new volunteers began: Brenda Osborne (Oct-Nov), Carly Pannell (Nov-Dec), Elaine Marshall (Nov-Dec), Emma Trembath (Nov-Jun), Francis Duff (Mar-Jun) and Wyne Johns (Mar-Jun) bringing the total volunteer contribution to 1400 hours. We depend on volunteers for all specimen mounting, assisting with filing, proofing labels and now some databasing as well. Rhys Gardner and Peter de Lange assisted with difficult vascular plant identifications; Jessica Beever and John Braggins with bryophytes.

Visitors

There were 44 visiting researchers, including major studies of lichens by David Galloway (Landcare Research) and Arve Elvebakk (Norway), *Hebe* by Mike Bayly (Te Papa), and liverworts by Matt Renner. Eleven interest groups visited, including a special visit in conjunction with 'Botanica' exhibition at the Gus Fisher gallery to view original botanical art, and 52 stage III Pacific Biogeography

students from University of Auckland carried out a herbarium-based project mapping the distribution of mistletoes. AK is also the main herbarium for study and loans by Barbara Parris, Peter de Lange, and Auckland University plant taxonomy students (Matt Renner & Catia Delmiglio).

Statistics

The major addition has been the 20,500 AKU vascular specimens which were added to Vernon. The large liverwort contribution was donated by John Braggins (977 specimens) and Matt Renner (388).

New accessions:		(2001-2002)
30 June 2003	283,579	
30 June 2002	<u>257,219</u>	
	26,360	(3,611)
Records on Vernon database:		
30 June 2003	189,705	
30 June 2002	<u>161,671</u>	
	28,034	(4,101)
Loans of specimens		
Inwards:	21[481 spec] from 8 institutions	(19[500] from 13)
Outwards:	44[1349] to 19 institutions	(54[934] to 24)
Exchange specimens		
Inwards:	346 specimens from 6 institutions	(240 from 6)
Outwards:	480 specimens to 9 institutions	(114 to 4)
Total number of specimens out on loan =	8,516 to 42 institutions	(7,917 to 38)

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

RESPONSES TO ARTICLES

The following two articles are in response to the article "A note on some attitudes in New Zealand botany" by Michael Heads which appeared in Issue 72.

■ **An "attitude" in New Zealand botany: a response to Heads**

P. B. Heenan, Landcare Research, PO Box 69, Lincoln, 8152, Canterbury, New Zealand.

I make the following response to the letter published by M. Heads (*New Zealand Botanical Society Newsletter* 72, 12–14, 2003) in which, in reference to myself, he makes some erroneous and misleading claims that some of his papers have been treated "in a rather unusual way." In addition to this reply, I would encourage readers to critically read the relevant papers so they can draw their own conclusions.

Mazus arenarius (Heenan et al. 1996)

Heads (2003) is correct that Heenan et al. (1996) did not cite Heads (1994). We were unaware of Heads (1994) at the time we drafted Heenan et al. (1996) as at that time it had only recently been published in an overseas journal. It was not a deliberate attempt to ignore his publication, and I accept responsibility for that oversight. No malice was intended and Heads (1994) was subsequently cited by Heenan (1998a).

In regard to *M. arenarius*, I would like to comment on the statement made by Heads (2003) where he contends "that I had already described, illustrated and mapped the species and recognised it as new". This statement strongly suggests that Heads (1994) had provided a formal taxonomic description and name that predated Heenan et al. (1996). He did not formally describe and name the species and his observations were brief and only a minor part of a larger biogeographic paper. Indeed, his "description" is meagre and mainly that of some aberrant peloric flowers: "flowering shoots terminate

either in one flower, or a pair of flowers back to back, or a pair fused as a peloric structure (Fig. 16), with the calyces and corollas fused, 8 stamens, and two ovaries closely appressed but not fused." There is no mention of growth habit, leaf, seed, or typical floral characters that would normally be included in a formal description, and no critical comparison was made with *M. radicans*. The illustration by Heads (1994) is of the peloric flowers, and no characteristic floral or vegetative parts of the species are shown. He only mapped two populations (False Islet and Stewart Island), which hardly constitutes mapping the species, and the distribution point for Stewart Island is based on the illustration and description in Wilson (1982) that Heads (1994) states "probably belongs to the same species". Mapping the species would usually be based on examination of a range of herbarium specimens and/or more thorough field surveys (cf. Heenan et al. 1996, fig. 4), and you would normally only map specimens if you were in no doubt of their identity.

Olearia virgata subspecies (Heenan 2001)

The leaf and floral characters I used to test the four subspecies erected for *O. virgata* by Heads (1998a) feature prominently in his key, descriptions, and text (cf. Heenan 2001, table 2). Based on the emphasis Heads gives to these characters it would be expected that they should support his classification irrespective of whether or not I included any growth habit characters. The phenetic approach was chosen as an objective method to test the *O. virgata* subspecies classification proposed by Heads (1998a) using characters that could be scored quantitatively.

Heads (2003) goes so far as to state that some of the characters ("leaf length, leaf width etc.") that Heenan (2001) used in the treatment of *O. virgata* "are of little significance in the group". This is a remarkable statement given that for each subspecies Heads (1998a) usually refers to leaf length, width, or shape in the key, description and text (cf. Heenan 2001, table 2), inferring their taxonomic usefulness in *O. virgata*. In comparison, Heads (2003) states that the characters he did recognise as diagnostic ("degree of shoot apex abortion, branch flexibility, branch recurvature, silver sheen of leaf tomentum, etc.") are simply not mentioned by Heenan (2001). Indeed, I did not mention these characters because they were inconsistently and infrequently referred to by Heads (1998a), and when he did mention them the character states were not comparable between the four subspecies. For example, the supposedly diagnostic characters "shoot axes regularly aborting" and "shoot axes aborting less often" are mentioned in the key but not in the descriptions or text, and there is no quantitative indication to what "regularly" and "less often" refer, as would be expected for such an important taxonomic character. The key also refers to branches being stiff or flexible for subsp. *serpentina* and subsp. *implicata*, respectively. This growth habit character is not mentioned in the description for either subspecies. Subsp. *serpentina* is said to be "laxly divaricating" in the description, but this state cannot really be compared to "branches stiff". Only the description and text of subsp. *centralis* offers any substantial detail in regard to branch characters, but the comparative states are not offered for any of the other three subspecies.

Heads (2003) introduces more uncertainty when he refers to the "silver sheen of leaf tomentum" being a useful diagnostic character in *O. virgata*. I am unsure what this means, as this contradicts his 1998 paper where he states that leaf tomentum is similar among the 4 subspecies and, furthermore, this character is not used in his key. Nevertheless, for subsp. *serpentina*, Heads (1998a) does comment, "leaf tomentum is similar to that of subsp. *virgata* but has a more distinctly silver sheen", and his descriptions state that the tomentum of subsp. *virgata* is "without brownish cast" and subsp. *centralis* is "often with a brownish tinge". I have carefully examined a range of herbarium specimens in AK, CHR, and WELT, and found that leaf tomentum in *O. virgata* is variable in colour, ranging from silver through to brown. I found no discrete groups and had to conclude that leaf tomentum colour is not a useful taxonomic character. In addition, and in contrast to what Heads observed, the tomentum of specimens of subsp. *virgata* annotated by M. J. Heads also often have a distinct brown coloration and could certainly be described as having a "brownish cast".

I note that Heads (2003) has not addressed any of the many internal inconsistencies between the descriptions, key, and general text of Heads (1998a) (see Heenan 2001, table 2). Although I had my own doubts about his *O. virgata* classification, it was these inconsistencies that also prompted me to look more closely at his treatment, as I could not understand how each of his subspecies were circumscribed and best recognised.

Fabaceae

I do not understand why Heads (2003) mentions my Fabaceae publications as he has not published on this family and therefore my papers do not criticise him or overlook any of his publications. If he has a problem with any of my taxonomic treatments he should undertake some scientific studies of his own and offer an alternative view based on scientific evidence and not unsubstantiated opinion. It is obvious from his comments, however, that he hasn't read properly or understood the papers he is criticising.

Concluding remarks

In his letter, Heads states that he supports a method of analysis called Croizat's panbiogeography, a discipline that he considers "the authors cited are desperate to suppress at any cost." The purpose of my two alternative taxonomic treatments (Heenan 1998b, 2001) for *Raukaua* (Mitchell et al. 1997) and *Olearia virgata* (Heenan 1998a) was to provide further contributions to the taxonomic understanding of the New Zealand flora and to offer an alternative view to what I consider to be poor taxonomic treatments proposed by Heads and co-authors. A stable and reliable taxonomy provides names that can be understood and consistently applied. The Heenan papers in question do not consider or address any issues to do with Heads personal panbiogeographic views (e.g., Heads 1998b). Some of these views have been critically evaluated by others (e.g., Wallis & Trewick 2001).

Acknowledgments

I am very grateful to a number of my botanical colleagues and friends for advice and discussion on the issue of whether or not to respond to the Heads letter. I elected to respond in this instance as some of the statements made by Heads questioned my integrity and therefore need to be corrected. On the issue of science, I recommend that those who are interested read the relevant papers.

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▪ **Reply to Note**

In his article "A note on some attitudes in New Zealand botany" (*New Zealand Botanical Society Newsletter* 72: 12–14), Michael Heads alleged that most of the work he has submitted to *New Zealand Journal of Botany* (NZJB) has been rejected outright. The term "rejected outright" implies rejection without peer review. I wish to advise your readers that Dr Heads' allegation is incorrect.

All papers submitted to NZJB that are within the scope of the Journal and are adequately prepared are reviewed by two independent specialist referees. These referees are selected from an international pool, and the referees for any given paper will be from different countries whenever

possible. The Journal's reviewing policy is clearly stated in the "Information for authors" published in the March issue each year and available at: www.rsnz.org/publish/instruct_auth.php

Since 1993, Dr Heads has submitted seven papers to NZJB. Of these, four have been published (in 1997, 1998, 1999, and 2000), two were rejected on the advice of referees, and one was withdrawn by the authors. Rejection of two papers out of seven submitted, on the advice of international referees, does not constitute "outright rejection" of "most of the work submitted".

Dr Frances Kell, Editor, NZ Journal of Botany

BIOGRAPHY/BIBLIOGRAPHY

■ **Early New Zealand Diatomists; Their Contributions to the Study of Fossil and Recent Diatoms**

Frederick S.C. Reed deceased, late of Christchurch.

Fred Reed, one of New Zealand's foremost diatomists, died on 25th March 1995 leaving behind an extensive collection of slides, books, papers and samples of fossil and other diatomaceous material¹. Although, like the majority of New Zealand's diatomists, Fred's life-long passion with diatoms was at the amateur level (to the extent of making his own microscope and slide cabinets). Many of his beautifully crafted slides are found in collections of other diatomists around the world, especially those made from the Oamaru diatomite which was the main source of his slide collection. A fitting memory of Fred is to be found in the magnificent atlas of 279 photomicrographs of diatom taxa from Oamaru included in the book "The Oamaru Diatomite" (Edwards, 1991). Two living diatom species have been named after him – *Amphiprora reedii* Stidolph and *Triceratium reedii* Desikachary & Sreelatha.

¹ *The Reed collection is lodged in the Allan Herbarium, Landcare Research, Lincoln.*

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- Cassie Cooper, V. & Harvey, M. 2003. Frederick Reed: pioneer New Zealand diatomists 1905-1995: an account of his life and collections. *Journal of the Royal Society of New Zealand* 33(2): 571-581.
Edwards, A.R. (comp.) 1991. The Oamaru Diatomite. DSIR Paleontological Bulletin 64. 260 p.

In 1981 Fred wrote the following article on early New Zealand diatomists.

The history of diatomists of New Zealand is most interesting. It involves a large number of men and women from all walks of life following a great variety of professions, while at the same time devotedly spending many hours of study searching for and cleaning innumerable species and varieties of diatoms found in New Zealand's lakes and rivers or coastal waters, and dead frustules from fossil deposits.

Looking back to the days when early colonists began arriving on these shores, several people brought with them microscopes for natural history studies. The prepared slide of diatoms was always a popular object of study; and as the settlers spread over the country, creeks, rivers and estuaries were examined and many freshwater fossil deposits were discovered. Microscopical clubs were established in the main cities and field trips became very popular. It was not long before papers began to appear on New Zealand diatoms in various journals, both here and in Europe.

In four publications between 1881 and 1883 we find papers by John Inglis - a member of the Philosophical Institute of Canterbury for a number of years. He described several diatomaceous deposits of New Zealand; the one at Lake Sumner, Canterbury, being somewhat difficult to find, owing to insufficient descriptions given. Many who searched for it could not find it. In 1941 I was successful in locating it, and from samples gathered, many diatomists both here and overseas have enjoyed examining it. One in particular was Horace Barber of Nuneaton, England, who published papers on several New Zealand deposits in the Journal of the Quekett Microscopical club, London.

By the number of micro-slides containing diatoms, sometimes to be found in second hand dealers' shops throughout New Zealand, it is obvious just how many students have devoted so much time to the study, whether it was for commercial interests such as the use of diatomite in concrete, filtration

aids, in gelatine manufacture etc., polishing and grinding purposes or scientific research in the fields of Geology, Zoology and Biology.

About 1880 the late A. McKay, Geological Survey, Wellington, examined a white- to cream-coloured earth from Cormack's railway siding near Oamaru, finding that it was diatomaceous earth of fossil-marine origin. Samples were sent to England for examination by several well-known diatomists. In 1886-1887 E. Grove and G. Sturt published the first of these papers in the *Journal of the Quekett Microscopical Club*, causing great excitement among diatomists throughout the world; for they had found over 100 new species and 4 new genera, namely *Anthodiscus* E. Grove & G. Sturt 1887 = *Anthodiscina* P.C. Silva 1970, *Monopsis* E. Grove & G. Sturt 1887 = *Monopsis* Van Heurck 1896, *Kittonia* E. Grove & G. Sturt 1887 and *Huttonia* E. Grove & G. Sturt 1887. Since that time the list of species found in Cormack's and several other deposits in that area has grown to nearly 1000, with several more genera.

Going back to 1889, the late Dr Harry A. de Lautour of Oamaru, a member of the Otago Institute, published a paper (*Transactions of the NZ. Institute* 21: 293-311) on the fossil deposits of Oamaru - chiefly as a guide to where the various deposits are to be found; together with a map of the area, methods of cleaning the earth, a list of Grove and Sturt's discoveries, and some historical facts of the district. Included are several names of people in the Oamaru district at that time who were interested in these deposits, such as John Forrester, C. Peach (Oamaru Harbour Board); and Charles Gifford (Waitaki Boys' High School) who probably was the first to find and examine the deposit at Jackson's farm. Mention is also made of Joseph Steven of Christchurch, at that time a member of the New Zealand Institute of Canterbury. His method of cleaning the earth was fully described. In 1937 I had the good fortune to meet the step-son of the late J. Steven, and was able to show him several slides made by his step-father which had been collected locally from marine and freshwater gatherings.

Interest in the deposits of Oamaru has continued ever since their discovery; and the list continues to grow. In recent years, a detailed study of the area has been made by N. de B. Homibrook and A.R. Edwards of the former New Zealand Geological Survey, Lower Hutt, near Wellington (Edwards 1991). During 1938 I visited a team in Dunedin of very active and keen diatomists at the home of Mr. Leslie D. Coombs. The team consisted of L.D. Coombs, his two sons Jack and Douglas, S. Rawson and Dr. M. Watt. If one wanted to know anything about diatoms this surely was the place to be; for they were all experienced in all branches of the subject.

Mr L.D. Coombs was a well-known architect and designed many fine buildings in Dunedin. Until his death on 18 August 1952 at the age of 67 he worked constantly with diatoms, mostly on fossil-marine forms, and made a great number of photographs. Some of these were published in *The Microscope*, an English publication. [His large slide collection and unpublished atlas of Oamaru diatoms is housed in the Department of Geology, University of Otago - Edwards 1.c.].

Mr S.H. Rawson was a dentist by profession and spent many years collecting recent marine diatoms along the Otago coast. He also worked on the fossil-marine flora of Oamaru, in close association with Dr. M. Watt. Mr. Rawson died on 10 December 1951, leaving a nice collection of some 272 slides of recent-marine diatoms, later published by E.J. Ferguson Wood in 1961. There were also 475 slides of fossil marine taxa.

Dr Morris Watt, a bacteriologist at the Otago Medical School in Dunedin and a member of the Otago Branch of the Royal Society of New Zealand, had been studying diatoms for several years before the group was formed in Dunedin. He had an extensive library and first-class optical equipment also. He was fortunate in having met several people at Oamaru who were able to tell him of those who had found and worked on the Oamaru deposits in the early days. He continued to help and inspire students for many years, right up until his death on 8 March 1973.

Arthur J. Doig of Dunedin became well-known as a diatomist over the last 20 years, chiefly in connection with fossil-marine diatoms. In the course of his studies he wrote papers on the localities of Oamaru diatomite in *The Microscope* (1962) and was a member of the Quekett Microscopical Club. He compiled a checklist of the diatoms found in the diatomite of Oamaru up to about 1968 (published by A.R. Edwards (1991)). During the last few years of his life he travelled round the world alone in his yacht, gathering marine samples in many places. When nearing the end of his voyage he was washed overboard onto Raoul Island, some 600 km north of New Zealand during a storm. His body was found

by members of the Meteorological station there on 17 August 1980. [He was only 55 years at that time.]

D. Jamieson Amiee of Auckland, an employee of the [former] Auckland Electricity Board, made a study over a period of several years of freshwater fossil diatomite deposits around Auckland, fortunately finding deposits known years ago, but mostly now lost to science. One in particular was that at Gordon's Road, and two others on the same lava field, i.e. Gribblehurst Park (formerly Cabbage Tree Swamp) and Morningside (formerly Kingsland). Besides being a very enthusiastic diatomist he was a good mechanic and constructed an excellent micromanipulator for microscopic objects. This was described in the Journal of the Microscopic Club in February 1966.

Born in New Zealand in 1894, Dr. R.M. Wishart spent much of his time as a young man visiting the Oamaru District, collecting diatoms and meeting people who were also interested in studying them; such as a chemist of Thames Street, Oamaru called Mr. Morris, who had been cleaning and mounting diatoms before 1910. In 1919 Dr Wishart left New Zealand to take up a practice in Melbourne, which he continued until 1950. Soon after arriving in Melbourne he joined the Microscopical Society of Victoria and the Field Naturalists' Club of Victoria. He became a Council member and group leader of their microscopical section of these organisations. Some of his close associates in the diatom field there were well known at the time, namely Messrs. Barrett, Black, Tindale and James Wilson, all of Melbourne. Dr Wishart was also President of both the Anthropological Society of Australia and the Victoria branch.

I would like to make a brief reference to a man who visited New Zealand many years ago: H.J. Grayson of Yorkshire, England. He returned to England before settling in Melbourne, Australia, where he assisted in the University's Geology Department. From material he collected in New Zealand he made many beautiful slides of diatoms. His greatest achievement was the making of a machine for micro-ruling. His best test-plate consisted of 12 groups from 10,000 lines per inch to 120,000 per inch. I published a paper on H.J. Grayson and his work in *The Microscope* (Vol. 11, 1957).

Another Englishman who spent many years in New Zealand was James D. Raeside, now living in retirement at Ganges, British Columbia, Canada. While in New Zealand he was a member of The Lands and Survey Department, and lived in several different parts of the country. He was particularly interested in freshwater diatoms, and published a paper on the occurrence of the diatoms *Cymbella jordanii* Grun ex Cleve 1894 [= *Encyonema jordaniforme* Krammer 1971 and *Eunotia serpentina* (Ehrenberg) Ralfs ex Ralfs in Pritchard 1861] in New Zealand (Raeside 1970, *Nova Hedwigia* 31: 537-541).

L.I. Grange, N2 Geological Survey, is remembered for his paper on Diatomite: principal New Zealand occurrences and uses (*NZ Journal of Science and Technology* 12 (2): 94-99).

Dr E.A. Flint, Canterbury, made many studies of the phytoplankton of New Zealand lakes, an early study being that of Lake Sarah, about one mile from the Mountain Biological Station belonging to Canterbury University College (E.A. Flint 1938, *Journal of Ecology* 26: 353-358). A list from many other lakes in New Zealand of diatom and other taxa was made by Elizabeth A. Flint in the book edited by V.H. Jolly and J.M.A. Brown on New Zealand Lakes: Auckland University Press/Oxford University Press 1975.

I first made the acquaintance of Dr Vivienne Cassie, an active worker in New Zealand today [1981] on freshwater algae, in 1958, when she was a member of the New Zealand Oceanographic Institute. After transferring to Auckland, she was for a time at Auckland University and then with the Department of Scientific and Industrial Research in Botany Division. Dr Cassie has also spent sometime studying in USA and UK, and has had many visits to the South Island of New Zealand in collaboration with research workers at the D.S.I.R., Lincoln. She has published a number of papers of phytoplankton and other algae of New Zealand, and also contributed to papers by colleagues, such as Part 3 of Studies of Australian and New Zealand diatoms by E.J. Ferguson Wood and L.H. Crosby [1959: *Trans. Roy. Soc. N.Z.* 87, Parts 3 & 4: 211-219].

Stuart R. Stidolph of Levin [now of Napier] published a paper in 1980 on some marine diatoms from Porirua Harbour, New Zealand [*NZ Journal of Botany* 18: 379-403]. He has been studying marine forms for a number of years, and was closely associated with the late Arthur J. Doig. His studies on

littoral flora distribution continue, and no doubt we will see further publications. [This has indeed been the case: Stuart Stidolph has produced a series of excellent taxonomic papers on New Zealand marine diatoms, published in 1985, 1986, 1988, 1990, 1994, 1998].

While this report covers most of the enthusiastic diatomists of New Zealand during the last 100 years, one must not forget the large number throughout the world, especially in Great Britain, who, from samples received from New Zealand, have contributed many splendid papers and formed life-long friendships by their correspondence to these islands.

Up-to-date references [in brackets] are by Vivienne Cassie Cooper, Landcare Research, Private Bag 3127, Hamilton.

Biographical Notes (51) : David Monro (1813–1877)

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

When David Monro landed at Nelson in March, 1842, at the age of 29, he became the seventh of that band of pioneer settlers who contributed so much to the botanical exploration of New Zealand. Those who preceded him were:

1. William Colenso: 30 Dec. 1834; Bay of Islands, North Auckland (1).
2. John Edgerley: 30 July, 1835; Hokianga, North Auckland (2).
3. Richard Taylor: 10 March, 1839; Bay of Islands, North Auckland (3).
4. Francis Logan: 12 Feb. 1840; Hutt Valley, Wellington (4).
5. David Rough: at Bay of Islands, North Auckland, by April 1840 (5).
6. William Swainson: 24 May, 1841; Hutt Valley, Wellington (6).

Monro was followed by Andrew Sinclair, who arrived at Auckland on 23 December, 1843, after a short visit to the Bay of Islands in 1841–42 (7). And we could note here—just for the record—that when Monro arrived in 1842, the first of our New Zealand-born botanists were already growing up. They were William Leonard Williams (b. 1829, at Paihia, Bay of Islands), and Richard Henry Matthews (b. 7 July, 1835, at Kaitaia, North Auckland). Both were the sons of missionaries.

David Monro was born in Edinburgh on 27 March, 1813. His great-grandfather, Alexander Monro, had been Professor of Anatomy at the University of Edinburgh and founded the world-famous Edinburgh Medical School; and David's grandfather and father (both also called Alexander) occupied the Chair of Anatomy in their turn (8).

Young David was educated at the Edinburgh Academy until 1828. He then spent two sessions at the University of Edinburgh, taking general studies. These included chemistry under Professor Hope and natural history under Professor Jamieson, with geology and field trips part of the latter. This course—which sounds like some early Medical Intermediate—was followed by a year at an English clergyman's in the north of England where David extended his Latin, Greek, and Algebra, and studied the logic of Aristotle. Finally, in 1832, he enrolled in the medical school at the University of Edinburgh. The botanical lectures for the medical students were given by Robert Graham (1786–1845) who had become the first Professor of Botany at Glasgow in 1818, and came to Edinburgh in 1820 (8,9). However, in a letter to Sir William Hooker from Nelson, dated 25 May, 1852, Monro wrote: "I regret extremely when on these expeditions the very limited amount of my botanical knowledge. When studying for my profession, the summer that I should have devoted to botany was spent by me upon a sick bed, prostrated by a typhoid fever the consequence of a puncture received in conducting an autopsy. I was therefore obliged to study botany in winter, and my knowledge of it is accordingly [illegible] a practical character learnt from the pages of books, and not from the living page of nature."

After graduating MD on 1 August, 1835, Monro set off on a 3-year study tour, which took him to London, Paris, Berlin, and Vienna. Back in Edinburgh by the autumn of 1838, he set up in practice, diversifying this by giving anatomy lectures to art students in 1839 and 1840 (8).

In 1841, backed by his father, Monro bought four allotments of land in the New Zealand Company's proposed second settlement, which had been named Nelson (following Wellington) but, as yet, had no location; and on 12 May he left Gravesend as surgeon on the *Tasmania* bound for Victoria, Australia,

where his brother, Harry, had a sheep station some 80 miles up country from Melbourne. Here he tarried from September 1841 to January 1842, before proceeding to New Zealand, where he landed at Nelson about a month after the first New Zealand Company settlers arrived on 1 February, 1842. After surveying the scene for three months he decided to stay, returning only briefly to Melbourne to collect his belongings and a flock of sheep. He settled at Waimea West, on the western bank of the Wairoa River, some 13 miles south of Nelson.

Monro was soon a leader in the young settlement – a Justice of the Peace in May, 1842, and an early member of the Nelson Literary and Scientific Institution. In the autumn of 1844 he accompanied Frederick Tuckett, the New Zealand Company's surveyor and agent in Nelson, in a search for a suitable South Island site for the company's "New Edinburgh". They left Nelson on 31 March on the *Deborah* and, after calling at Port Nicholson (Wellington) for the Government representative, arrived at Port Cooper (Lyttelton) on 5 April, spending four days with the Deans brothers at Riccarton. They then coasted further south, calling at Moeraki (18 April), Waikouaiti, and Otago Harbour. From here, Tuckett, Monro, and three Maori, walked for six days to the mouth of the Molyneux River (the Clutha). The *Deborah* then took them to New River Harbour where Monro walked over the area that became Invercargill. In the end Tuckett chose Otago Harbour and its hinterland for the New Edinburgh settlement, a name soon changed to Dunedin (8,10,11, 15).

On 7 May, 1845, David Monro married Dinah Secker at St. Michael's Anglican Church, Waimea West. At their home, "Bearcroft" (built of pit-sawn timber), Monro established his orchard and vegetable garden, becoming one of Nelson's leading horticulturists and at "Bearcroft" they reared a family of 5 boys and 2 girls. In 1848 Monro was granted land across the range in the Wairau Valley, Marlborough (8). It lay in the valley of the Waihopai, near where it joins the Wairau; and here Monro took his sheep. This meant that "two or three times in the course of the year I have to make a journey from this place (the Waimea) where I reside to the Wairau, nearly 100 miles distant by the bridle path, though probably not above 30 in a straight line" (letter to Sir William Hooker 20 Sept. 1849). But Monro could not always rely on his Wairau fold. In March, 1849, he told J.W. Saxton that he had returned to practising medicine because "sheep farming at the low prices scarcely paid for itself." (12)

An important visitor to "Bearcroft" for several days in February–March, 1848, was John Carne Bidwill (1815–53) the Sydney businessman, explorer, and botanist (13). Bidwill was already well known for his *Rambles in New Zealand 1839* (1841) in which he described his journey to central North Island, when he was the second European to see Lake Taupo and the first to climb Ngauruhoe. He had also visited Wellington on business in August, 1840, but note that this was not the occasion of his Nelson visit as claimed by Allan (14).

Bidwill was the first to collect alpine plants in North Island, sending specimens to the English botanists, John Lindley and Sir William Hooker, Director of the Royal Gardens, Kew; and now, under the guidance of Monro, he was the first to collect plants from inland Nelson, including some from the mountains. His specimens, sent to Sir William, were an invaluable contribution to the *Flora Novae-Zelandiae* (1852–55) written by Joseph Hooker, Sir William's son, where at least 60 are cited from Nelson.

Bidwill must have told Sir William about Monro because Hooker soon wrote requesting specimens and seeds from Nelson. This letter seems to be lost, but their further correspondence is summarised below. The materials available to me are copies of the four letters from Monro to Sir William Hooker held at the Royal Botanic Gardens, Kew, and copies of the three letters from Sir William to Monro held at the Alexander Turnbull Library, Wellington, as well as three plant lists held at the Turnbull.

1. 20 Sept. 1849: Monro to Hooker

Monro acknowledges Hooker's request, emphasising that his "knowledge of Botany is extremely limited and ... is not of a practical character." He then describes – and certainly not with the pen of a novice – where he might find new things during his journeys to the Wairau. For the first 40 miles in a southerly direction the "vegetation is poor and very little varied. In the bottom of the valleys and about the brooks there is some variety of shrubs, but the hills are possessed by fern to the exclusion of almost everything else." He considered that "as my friend Mr Bidwill has been over the ground, it is not likely that I shall find much that is new." Despite this he draws attention to a small phormium, and what seems to be a celmisia from which the natives strip the cuticle on the undersurface of the leaf to make into a yarn for fishing lines and leggings. Monro's way then led him through the Wairau pass,

lined for 10 miles by a uniform forest of black birch ("beeches I believe") with "very little underbrush" [my italics] and the ground covered with a soft green moss. "About midsummer the beautiful epiphyte (a loranthus I believe) is in flower in abundance." The traveller then emerges into the Wairau valley, still at nearly 2000 ft a.s.l., and Monro wrote: "the valley here consists principally of large stones and the vegetation is very poor. About the river, however, or on the islands enclosed between its branches there is a considerable variety of shrubs, and many of them I believe unknown: at least they are new to me." He promises to collect specimens when next he visits the Wairau. The remainder of his journey lies "down a grassy valley upon which nothing grows but grass with here and there a plant of anise and that vegetable porcupine which the colonists call spear grass." He gives clear descriptions of two noteworthy shrubs growing here, one probably *Notospartium* and the other probably *Pachystegia*. And he concludes his letter by asking Sir William to send the titles of any useful botanical books to his brother, Captain Monro, of Craiglochart, near Edinburgh, who would forward them to New Zealand. It is clearly no coincidence that near the mouth of the Waihopai River is a place called Craiglochart. This letter is not referred to by Wright-St Clair (8) Monro's biographer. Nor have I seen a reply from Hooker.

2. 25 May, 1852: Monro to Hooker

Monro announces the despatch of a case of dried specimens collected at some distance from the seashore and at some elevation, thus avoiding anywhere "already explored by French naturalists and others." At Lake Rotoiti, some 50 miles south of Nelson, there was very little that seemed new to him, but on the way back he climbed Gordon's Knob (4-5000 ft), a peak in the mountain range between the Waimea and the Wairau [the Gordon Range] and "gathered some plants which may be considered as alpine in this country and which, I trust, may be new to you." Monro notes that he has numbered his specimens and kept a list himself. Wright-St. Clair (8) states that this first collection contained 181 specimens, but he is confusing this 1852 consignment with Monro's consignment of 1854. I have not seen a copy of Monro's 1852 list, but its extent can be gauged from the list of identifications that Hooker sent back (see next letter). Monro also notes that next summer he hopes to visit the Fairfield Downs, an elevated district near the source of the Awatere, only recently opened up.

3. 4 Oct. 1852: Hooker to Monro (received 1 June, 1853)

Sir William thanks Monro for his collection "so well dried and containing so many of the rare species!" The material had come at an opportune time, because his son, Dr Hooker, was engaged in writing the Flora of New Zealand. Already two fasciculi of the Flowering Plants had been published, and copies, with their 40 plates, had been put aside for Monro. [the first, with plates 1-20, appeared on 10 June, 1852; and the second, with plates 21-40, appeared on 6 Sept. (16)]. Sir William explains that Monro's plants would either come into the fascicles yet to be printed, or into the Supplement. He sends a list of Monro's specimens, named as far as possible, and arranged in the order of families used at Kew. Monro's largest number is 191. Unfortunately localities are not given. Sir William also makes a plea for material for a museum of practical and economic botany being formed in the garden.

4. 20 Feb. 1853: Hooker to Monro (received 13 June, 1853)

The main purpose of this letter is to tell Monro that a Mr William Robson, "one of our garden men" is emigrating with his wife and young children to Nelson, where he has "a brother who has a sawmill," and to testify to his excellent character. A later letter shows that Robson's relative was his brother-in-law, Mr Baigent. In a postscript, Sir William acknowledges a letter from Auckland from Monro (apparently not kept).

5. 18 June, 1853: Monro to Hooker

Monro acknowledges Hooker's two letters, pointing out the differences in time taken to reach him and regretting that he has not received the fasciculi. Because he did not know whether his specimens were of any use he is sorry to say that he has relaxed his efforts to obtain more; but now that Hooker has put so flattering a value on his contribution he will "set to work with a zeal and perseverance which I have not yet felt." Unfortunately he was not able to visit the Fairfield Downs last summer because of limited time and heavy floods. The rest of the letter gives information about native trees, geography, and horticulture in Nelson, much of the latter quoted in (8).

6. 5 May, 1854: Monro to Hooker

Monro reports that "on coming into the town yesterday I met Dr Knight, the auditor general, who had just arrived on the Govt. Brig and who handed over to me to my great delight No. III of the N.Z. Flora." [this third fascicle had been published on 13 Jan. 1853 (16)]; but the first two fascicles had not yet

arrived. Monro is sending a small collection made up of 54 numbers collected by himself (the list is in the Turnbull Library) and the remainder (unlisted) collected by the shepherd, Roderick McDonald. Monro is going to Auckland for a meeting of the General Assembly and hopes to make the acquaintance of Dr Andrew Sinclair, the Colonial Secretary, and to persuade him to visit Nelson.

7. 21 Sept. 1854 Hooker to Monro

Sir William thanks Monro for the specimens, which have arrived just in time for the Supplement to the *Flora Novae-Zelandiae*. He congratulates McDonald on his collecting but thinks that a team of Monro and Sinclair would do even better. He will consult his friend, Sir George Grey, and his "friend and neighbour" Bishop Selwyn (then on furlough) about the best way to send the remaining fascicles to Monro. And he concludes: "please to tell me the name of the wood the boards are made for protecting the plants. It is coniferous I presume. We are making a vast collection of named woods for our Museum."

In the Turnbull Library there is a list entitled "Plants sent to William Hooker, April, 1854." I cannot relate this to any of the Monro letters that I have seen. There are 181 specimens and they should have arrived in time for the Supplement.

Monro's specimens are first noted in the *Flora Novae-Zelandiae* among the sedges and grasses of the fourth fascicle which appeared on 5 December 1853. There are seven mentions here, and one in the fascicles dealing with flowerless plants which follow. But Monro's name dominates the 15-page Supplement which appeared on 9 February, 1855. There are 45 entries involving new species and new habitats. The localities include Dun Mountain (near Nelson), Gordon's Knob, Lake Rotoiti, Upper Wairau, Waihopai (Wairau Valley), McRae's Run (Awatere) and one from Fairfield Downs. Certain comments by Sir William indicate that there are other letters from Monro than those mentioned in this note.

Monro continued to collect plants after the publication of the *Flora Novae-Zelandiae*. In early 1855 he and Dansey (of Dansey's Pass, North Otago) rode up the Awatere, down the Acheron and Clarence, and over Jollie's Pass to Canterbury and Christchurch. Monro's diary, as quoted by Wright-St. Clair (8), notes that on their second night up the Awatere (25 March) they stayed with McDonald, and that Monro spent the evening looking over the plants that the shepherd had collected for him. There are other diary entries about collecting specimens and seeds on this trip; and the material was doubtless used by Joseph Hooker in his *Handbook of the New Zealand Flora* published in 1864 and 1867.

In August, 1859, Ferdinand von Hochstetter, the Austrian geologist, visited Nelson, and Monro accompanied him on geological excursions, including climbing Dun Mountain. Monro also translated Hochstetter's speeches into English, and presided at the farewell public dinner, sitting between Hochstetter and von Haast (8).

Another important visitor was Dr Andrew Sinclair, who finally came to Nelson in c. 1860 and collected in the mountains with Monro.

Monro's last major contribution to New Zealand botany was made as a member of parliament. In 1853 he had won the Waimea West seat, the first of several electorates that he represented; and in 1861 he was elected speaker. On 10 Sept 1862 he moved (from out of the chair) "That a respectful address be presented to His Excellency, requesting him to recommend this House to make provision to the extent of £500 for the expenses attending the publication of a manual of New Zealand botany"; and he read a memorandum by Charles Knight outlining the project (8,17). This led to Joseph Hooker's *Handbook of the New Zealand Flora* to which Monro contributed much that was new. In 1864, at James Hector's request, Monro wrote an essay for the 1865 Dunedin exhibition entitled *On the leading features of the geographical botany of the provinces of Nelson and Marlborough, New Zealand*. It is an accomplished effort, outlining the salient features of the vegetation and describing the main trees and their uses. It includes a generous tribute to the late Andrew Sinclair and was reprinted in the *Transactions of the New Zealand Institute* in 1869.

On 10 Feb. 1866, Monro became Sir David Monro. In 1868, the elder of his daughters, Maria Georgiana, married James Hector, Director of the New Zealand Geological Survey, Wellington; and his 4th son, Charlie, after attending a rugby-playing school in England, introduced the game to Nelson (and New Zealand) in 1870. In that year, Sir David resigned the Speakership and in 1873 he resigned from politics. He died in Nelson on 15 February, 1877, at the age of 63 and, after a service in the

Cathedral, was buried in the Nelson Cemetery.

In the Preface to his *Handbook of the New Zealand Flora*, Sir Joseph Hooker wrote: "My late friend J.T. [sic] Bidwill Esq. of Sydney ... was the first explorer of the Southern Alps, making extensive and very important collections on the Nelson mountains, which were transmitted with copious notes to Sir W. Hooker. The same mountains have been still better explored by Dr Munro [sic] who has added many beautiful alpine species to the "New Zealand Flora" and sent an excellent herbarium of Nelson plants to Sir W. Hooker."

Eponymy

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| 1855 | <i>Ranunculus monroi</i> "Hab. Middle Island: summit of McRae's Run and Fairfield Downs, alt. 4000 feet, <i>Monro</i> . Fl. Decemb." J.D. Hooker <i>Fl. N.Z.</i> 2: 323 (<i>Supplementum</i>). |
| 1855 | <i>Aciphylla monroi</i> "Hab. Summit of McRae's Run, alt. 4500 ped, Nelson, <i>Monro</i> . Fl. Dec." J.D. Hooker <i>Ibid.</i> 330. |
| 1855 | <i>Senecio monroi</i> "Middle Island: mountains of KaiKora [sic], alt. 2–4000 feet, <i>McDonald (Monro)</i> " J.D. Hooker <i>Ibid.</i> 333. |
| 1864 | <i>Carmichaelia munroi</i> [sic] "Middle Island: from halfway up to the summit of McRae's Run, <i>Munro</i> [sic]." J.D. Hooker <i>Handbk. N.Z. Fl.</i> 49. |
| 1864 | <i>Celmisia munroi</i> [sic] "Middle Island: Upton Downs, Awatere [sic] elev. 1500 feet, <i>Munro</i> [sic]." J.D. Hooker <i>Ibid.</i> 133. |
| 1864 | <i>Raoulia munroi</i> [sic] "Middle Island: Waihopai Valley, <i>Munro</i> [sic]—" J.D. Hooker <i>Ibid.</i> 148. |
| 1864 | <i>Euphrasia munroi</i> [sic] "Middle Island: abundant on the alps, Dun Mountain. <i>Munro</i> [sic]." J.D. Hooker <i>Ibid.</i> 220. |
| 1906 | <i>Myosotis monroi</i> "South Island: Nelson – Dun Mountain, Monro—" Cheeseman <i>Man. N.Z. Fl.</i> 469. |
| 1945 | <i>Monroella</i> : subgenus of <i>Carmichaelia</i> . G. Simpson <i>Trans. Roy. Soc. N.Z.</i> 75: 275. |

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