

NEW ZEALAND BOTANICAL SOCIETY

NEWSLETTER

NUMBER 41

SEPTEMBER 1995



NEW ZEALAND BOTANICAL SOCIETY
N E W S L E T T E R
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Cover illustration

Elingamita johnsonii a small tree up to 4 m tall belonging to the Myrsinaceae is confined to two islands of the Three Kings group (see article page 20). The cover illustration is one of 25 illustrations by **Sabrina Malcolm** featured on the just published Manaaki Whenua Press Threatened Plants poster (see page 22).

New Zealand Botanical Society

President: Dr Eric Godley
Secretary/Treasurer: Anthony Wright
Committee: Sarah Beadel, Colin Webb, Carol West,
Beverley Clarkson, Bruce Clarkson
Address: C/- Auckland Institute & Museum
Private Bag 92018
AUCKLAND

Subscriptions

The 1995 ordinary and institutional subs are \$14 (reduced to \$10 if paid by the due date on the subscription invoice). The 1995 student sub, available to full-time students, is \$7 (reduced to \$5 if paid by the due date on the subscription invoice).

Back issues of the *Newsletter* are available at \$2.50 each - from Number 1 (August 1985) to Number 40 (June 1995). Since 1986 the *Newsletter* has appeared quarterly in March, June, September and December.

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

Subscriptions are due by 28 February of each year for that calendar year. Existing subscribers are sent an invoice with the December *Newsletter* for the next year's 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 1995 issue (Number 42) is 24 November 1995.

Please forward contributions to: Bruce & Beverley Clarkson, Editors
NZ Botanical Society Newsletter
7 Lynwood Place
HAMILTON

Contributions may be provided on floppy disc (preferably in Word Perfect 5.1) or by e-mail (ClarksonB@Landcare.CRI.NZ).

NEWS

New Zealand Botanical Society News

■ From the Committee

At a committee meeting held 1 September, the following decisions were made:

- Subscriptions for 1996 will remain at the existing levels
- Bev and Bruce Clarkson were re-appointed *Newsletter* editors for 1996
- Colin Webb was appointed as the Society's representative on the Loder Cup Committee.

Carol West was thanked for her term as our representative on the Loder Cup Committee.

Dr Eric Godley has indicated that after careful consideration he has decided that the time has come for him to relinquish the Presidency at the end of 1995. This announcement was noted with regret by the committee.

■ Call for nominations

Nominations are called for the following positions of Officers and Committee of the New Zealand Botanical Society for 1996:

President
Secretary/Treasurer
3 Committee Members.

Nominations for all positions opened 1 September 1995 and close on 20 November 1995. Nominations shall be made in writing to the Secretary, 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*.

Anthony Wright, Secretary, New Zealand Botanical Society, C/- Auckland Museum, Private Bag 92018, Auckland

Regional Botanical Society News

■ Manawatu Botanical Society

Past Meetings and Trips

Our first meeting of 1995 was to hear Yvette Cottam's account of her summer trip to Little Barrier Island where she worked on the DoC supplementary feeding programme for kakapo. Little Barrier is a familiar outline on the horizon of the Hauraki Gulf but seldom visited so it was interesting to hear a first-hand account of the rugged terrain and island vegetation.

Peter van Essen led our March trip to examine forest remnants and wetlands newly acquired by the Palmerston North City Council in the recently subdivided Moonshine Valley on the outskirts of Palmerston North. Two artificial ponds have been created by the previous landowner for waterfowl habitat. The council has been removing gorse from the area, but the gorse, with careful underplanting, could be used to good effect as a nurse cover for native re-establishment.

The forest remnant varies from open grass swards to reasonably closed canopy areas with lianes relatively abundant. While the forest has had trees removed in the past, some at least survived with a few large totara remaining and numerous middle-aged hinau. The forest is a variable mix of totara, hinau and pokaka with scattered younger kahikatea, miro and rimu. A preliminary species list of 81 indigenous species was compiled.

In April Claire Murphy gave us an account of her research on pollination ecology in Tongariro National Park. Claire is interested in the impact of bees on the montane ecosystem there. Beehives are currently banned from the Park, but hives can be legally placed just outside the Park boundary, and the bees are

not concerned by the DoC policy of exclusion of exotic organisms from the park and do cross the boundary and forage amongst the native vegetation. Claire's study aims to identify the impact the honey bee is having on the native flora and fauna and their contribution to the pollination and dispersal of heather and major native plants. Claire found that the bees foraged at least a kilometre into the Park, but found no sign of feral hives.

Preliminary results suggest that bees are not adding to the heather problem in the Park as exclusion of bees did not appear to alter significantly the amount of seed set. Recording insect visitation to three native species of plants, *Leptospermum scoparium*, *Phormium tenax*, and *Hebe stricta*, it appeared that high bee density reduced the diversity and abundance of native pollinators, which may be a cause for concern.

For our April trip we combined with Forest and Bird Society on the Mikimiki Walkway in the Wairarapa, led by Sybil Cresswell. This walkway is an old tramtrack, upgraded by DoC, with some board walks. There is also the remains of a redwood plantation, started as a commercial venture but abandoned in the depression of the thirties. This grove gave welcome, though somewhat inadequate shelter for a lunch stop in the pouring rain. The weather resulted in the trip ending early, however the bush contains some fine podocarps and beeches and many epiphytes and is earmarked for a return visit on a better day.

At our May meeting, Jill Rapson told us highlights of her Northland field trip with a group of ecologists from the University of Otago, including the Bryophyte Workshop at Waipoua Forest, and a general reconnaissance of interesting dune and coastal sites where future studies might be conducted.

A visit was made to the DoC reserve at Lake Ohia, where the shrinking peat has exposed the stumps of a submerged kauri forest. The heathland along the way to Spirits Bay was a botanical highlight.

The trip ended with six days hard work at Emauha Point near Te Pahi, where marsh-mangrove, marsh-manuka and manuka-pasture ecotones were studied by doing a series of contiguous quadrats, noting the species and measuring some environmental factors for each quadrat.

Our June meeting took us to the South Island, with Peter van Essen describing in words and pictures the Spencer Mountain Crossing he had undertaken in December. The heavy snow of the previous winter had resulted in considerable avalanche damage in the mountain beech forests, and a number of streams had jumped their banks and gouged out new paths through the forest. It was too early in the season for many alpine plants to be flowering, but the beech trees showed a heavy mast flowering, which had been predicted after the warm dry conditions of the previous summer, which would have been conducive to formation of floral primordia in these autumn-initiating plants. Around Lake Rotoiti the red beech forest was also flowering heavily. In the Maruia Valley there were large areas of windthrow from the big blow twelve years ago, and now 3 m high silver and mountain beech saplings are competing to replace the fallen forest.

Our June field trip, led by Yvette Cottam, was to Mount Bruce. Much of the vegetation is regenerating scrub, mainly mahoe, with lots of young emergent rewarewa. Here again the mast flowering of many native species was noted, under the beeches the ground was almost completely covered with beech cupules. *Coprosma grandifolia* and kahikatea were also laden with fruit.

In July Viv Nicholls spoke of her three years spent as a gardener on the Isle of Skye, where she worked at Dunevegan, the seat of the McCleod clan, where the castle, dating from the 10th century, is the oldest inhabited castle in Scotland. The garden, on volcanic soil, is being further developed and we gained a good impression of the garden and surrounding country from Viv's slides, while the atmosphere of the Isle was evoked with background Celtic music.

Forthcoming meetings

(7.30 pm Seminar Room Biology Building, Massey University)

August 2	Alistair Robertson - Mistletoes
September 7	John Clemens - Natives in horticulture
October 5	Don Ravine - Manawatu PNA survey
November 2	Bryophyte workshop
December 7	Pot-luck tea and photo-viewing

Forthcoming trips

August 12	Keebles Bush tree planting
September 9	Mystery trip
October 8	Margot Forde Arboretum, Sixtus Lodge

October 15 Otaki Forks with Forest and Bird
November 4 Titoki Point gardens
December 9 Totara Reserve

All interested are invited to attend our meetings and trips. For further details, contact Jill Rapson, or Peter van Essen, Ecology Department, Massey University, Private Bag 11222, Palmerston North

Barbara Latch, 42 Batt Street, Palmerston North

■ Nelson Botanical Society

June field trip: Queens Gardens and Botanical Hill

Laurie Metcalf did a much appreciated job of keeping the group together and well informed. He provided an interesting commentary on each of the species we stopped at. They included the perpetual flowering and fruiting puriri, the king fern (*Marattia salicina*) and *Adiantum formosum* only extant in New Zealand in the lower North Island, *Meryta sinclairii* and *Macropiper excelsum* subsp. *psittacorum* from the offshore islands. There were numerous *Pseudopanax lessonii* forms and the peculiar *Pseudopanax x adiantiformis* a natural hybrid between *P. arboreus* and *P. crassifolius*. Introduced species of interest included the huge dawn cypress (*Metasequoia glyptostroboides*) and the swamp cypress (*Taxodium distichum*).

From the gardens we moved to Botanical Hill. On the lower western slopes an intricate mixture of common introduced pests, planted native and introduced trees share the forest. Weeds include *Selaginella kraussiana*, *Pteris cretica*, wandering jew, periwinkle, wild garlic onion, and old mans beard. In spite of this a good range of native ferns is present. On the upper slopes, especially near the summit is a tremendously diverse range of *Olearia*, *Hebe* and other native shrubs. On the eastern side of the Hill, ash, kanuka, barberry and hawthorn form a mosaic of regenerating forest often stifled by old mans beard. The final short return climb took us through a stand dominated by yew but with a dense fern understorey.

July field trip: Cablebay Walkway

Well we seem to have beaten the weather again. A good turnout of 19 headed up the walkway on a fine day. The forest is an interesting mix of red, hard and mountain beech with hinau, rimu miro and other podocarp forest species. Over 50 species of ferns and a few late *Pterostylis alobula* and *Cyrtostylis oblongus* were seen.

For the adventurous the return route via the cliffs and the shore provided grand view of beach and a chance to see some of the dry rock ferns, notably *Pellaea calidruprium*, *Cheilanthes distans* and *C. sieberi*. The fascinating helicopter grass (*Chloris truncata*) was also quite common.

August field trip: Kina Beach to McKee Domain

A quiet beach walk in the spring sunshine. Kina beach has a small remnant of mahoe-ngaio forest and now has well developed shelter plantings of ngaio, akeake and akeraho. For the first kilometre a strip about a 20 metres wide contained regenerating forest, pines, blackberry etc. In this strip there were frequent large patches of *Asplenium oblongifolium* and areas of silver tussock. Finally the cliff edge was closer to the shore and we were able to wander through tall mahoe forest with the odd huge 20 m tall five finger. Titoki suddenly made its appearance and in the grassy clearings we found *Hypolepis dicksonioides*, a rare plant in Nelson. The bare, stony cliffs marked the shore and only the odd introduced plant clung to them.

At McKee Domain we were suddenly in tall titoki forest with matai, mahoe and pigeonwood. This is one of the last substantial remnants of the original coastal forest in the area. A new arrival since Kelly's list of 1974 was *Hoheria populnea* and it was good to see that mistletoe (*Ileostylus micranthus*) was still there, perhaps even the same plants, at the lookout point.

Forthcoming trips

September 17	Wairoa remnants
October 15	Belmont
Labour Weekend	Puoponga Farm Park, Farewell Spit.
November 19	Trig K Caanan
December 17	Gordons Knob

Graeme Jane, 136 Cleveland Terrace, Nelson

■ Waikato Botanical Society News

The society has been reasonably busy despite the cancellation of one field trip (Awaroa Scenic Reserve, Coastal) due to an unusually persistent period of wet weather. The society has held a mid-Winter pot-luck dinner, slide show and herbarium workshop. The dinner was well attended, although few slides were shown, and as the facilities were incredibly cold most participants departed early. The following day seven members attended the Waikato herbarium workshop, and as a result several hundred specimens were mounted, accessioned and filed away. The society is keen to hear from anyone who is willing to donate several hours a week to assist with the updating of the herbarium collections (Contact Person: Catherine Beard (07) 838 4372).

Two field trips are planned for the next few months: a joint Rotorua/Waikato Botanical Society visit to a bush remnant near Karapiro, (south-east of Cambridge), and another Waikato/Rotorua Botanical Society excursion to the Mangakowhiriwhiri Stream Gorge south of Whakamaru. In the meanwhile the society's long-term project viz. the preparation of a Flora of the Hamilton Basin is well under way, with Peter de Lange preparing a base map of the area to be surveyed, and with assistance from Paul Champion, compiling a list of plant records (including those which are vouchered in herbaria) from the region and relevant literature. While progress is slow - due to work commitments - considerable interest in the project has been shown by the Waikato Conservancy of the Department of Conservation.

Society newsletters

Numbers 43 & 44 have been published. Contents include:

Waikato Botanical Society Newsletter No. 43

Includes notification of:

- planned field trip to the Awaroa Scenic Reserve (Coastal) by P.J. de Lange
- dinner and slide show evening details
- herbarium workshop details

Original articles and field trip reviews:

- Information on mistletoes sought
by P.J. de Lange - a request for Ioranthaceous mistletoe records from the Waikato
- Waiomu Ecological Area Field Trip Report
by D. Stephens - describes results of a visit to this part of the Coromandel Peninsula

Evening meetings/miscellaneous

- Waikato Botanical Society Programme 1995-1996
- Waikato Botanical Society AGM 12 May 1995 Minutes
- Presidential Address
- Financial Report

Waikato Botanical Society Newsletter No. 44

Includes notification of:

- Planned field trip to Karapiro area
by L. Gibbons and C. Jones
- Planned field trip to the Mangakowhiriwhiri Stream Gorge
by C. Jones

Original articles and field trip reviews:

- Mushroom hunting in the Awaroa Valley, Kawhia
by P.J. de Lange and P. Buchanan - describes and requests fresh material of an undescribed species of polypore fungus *Ganoderma cf. tropicum*.
- Ruapehu alpine flowers trip to Mangaturuturu headwaters
by C. Jones - describes results of a visit to part of Tongariro National Park

Evening meetings/miscellaneous:

- Herbarium workshop
by Catherine Beard - outlines progress made on reducing the backlog of unprocessed specimens held by the Waikato Herbarium (WAIK).

P.J. de Lange, Science & Research Division, Auckland Conservancy, Department of Conservation, Private Bag 68908, Newton, Auckland

■ Wellington Botanical Society

At the 56th Annual General Meeting of the Wellington Botanical Society held on 21st Aug 1995, the following Officers were elected: President: Tony Silbury; Vice Presidents: Barbara Mitcalfe, Olaf John; Secretary: Pat Enright; Treasurer: John Scroggins; Committee: Margaret Aitken, John Sawyer, Philip Simpson, Kath Dickinson, Jane Shearer.

Meeting and Trip Schedule until Dec 1995

Saturday 7th Oct. 1995, Field Trip Mt Kau Kau

A trip up Mt Kau Kau to look at one of the last sites of *Gunnera prorepens* in the Wellington district and other relict populations.

Leader: Olaf John 479-7605 Deputy leader Chris Horne 475-1205

Monday 16th Oct 1995, 7.30 pm - Evening meeting
Wellingtons Orchids - Ian St George

Saturday 4th Nov. 1995, Field Trip Whitireia Park

To look for and map the occurrences of *Leptinella nana*

Leader: John Sawyer. Phone 384-1485(h) 472-5821(w)

Deputy Leader: Pat Enright Phone 499-0355 (w) 479-1208 (h)

Monday 20th Nov. 1995, 7.30 pm - Evening meeting

The new Harbour Park - Bob Brockie and Boyden Evans.

Bob Brockie, Project Conceptualiser, and Boyden Evans of Boffa Miskell Ltd have designed the Harbour Park: to be situated between the sea front and the new Museum of New Zealand, Te Papa Tongarewa. They will show slides and discuss the considerations which they are working through in order to create an appropriate ecological setting for the Museum.

Saturday 2nd Dec. 1995, Field Trip Kaiwhata River Valley

To look for *Alepis flavida* last seen in 1947.

Leader Tony Silbury 589-9188

Deputy Leader: John Sawyer 384 1485 (h) 472 5821 (w)

Christmas trip - Wednesday 27 Dec 1995 - Saturday 6 Jan 1996, Lewis Pass area

Lakes Christabel and Daniels, St James Walkway, Cannibal Gorge, Hope and Wairau Rivers. Trip will be based at Windy Point, a school lodge just west of "The Poplars" on the Lewis Pass road. There is inside accommodation and suitable places for tents outside. Some offers giving transport to extra passengers and bulk food have been made but more would be appreciated. Please bring bread, butter, scroggin and fresh fruit. Other food will be provided for breakfast, lunch and dinner. Also bring your swimming togs as there are hot pools. Bookings with deposits of \$100 by 15th Nov. 1995 to Margaret Aitken, Godley Street, Lower Hutt. 566-2731 (h) 801-8838 (w) (Note cheques payable to M. Aitken B.S a/c). Late bookings may be taken.

Pat Enright, P O Box 10412, Wellington

NOTES AND RECORDS

Plant records

■ *Urtica linearifolia* (Hook. f.) Cockayne - a new northern limit

Urtica linearifolia is an indigenous scrambling stinging nettle. It occurs locally in the southern North Island and in the South Island, and the most northern published location for the species is "near Waikaremoana" (Allan, 1961). In the early 1980s W.B. Shaw and I discovered a colony growing on the margins of a small wetland near Lake Waikaremoana (latitude 38° 48'). The species has recently been classed as vulnerable in the threatened plant list (Cameron *et al.* 1995), which has raised its profile in the botanical world. So it was with considerable surprise and delight that Rob Jessop and I recently found *U. linearifolia* growing at least 20 km north of Lake Waikaremoana at two separate sites near Broadlands in the Atiamuri Ecological District. The most northern site is at approximately latitude 38° 30'. A herbarium specimen has been lodged (NZFRI 21528).

One site is a small wetland adjacent to a small stream. *U. linearifolia* was scrambling through tussocks of *Carex secta* and *C. virgata*, which were growing amongst harakeke (*Phormium tenax*), *Cortaderia toetoe*, *Coprosma propinqua* subsp. *propinqua*, baumea and swamp kiokio (*Blechnum minus*). Several grey willow (*Salix cinerea*) were present.

The other site is adjacent to the Waikato River and is periodically inundated with water. Here *U. linearifolia* was again scrambling through isolated tussocks of *Carex secta* and *C. virgata* which were surrounded by an assortment of herbs and sedges including *Polygonum hydropiper*, beggars ticks (*Bidens frondosa*), creeping buttercup (*Ranunculus repens*), spike sedge (*Eleocharis acuta*), pennyroyal (*Mentha pulegium*), spearwort (*Ranunculus flammula*) and *Bolboschoenus caldwellii*.

Both sites are part of marginal strips administered by the Department of Conservation. Appropriate protection management requirements need to be assessed for the two sites.

It is likely that this uncommon species occurs at other locations in the vicinity and I would be interested to hear of any other recent sightings of this species in the central North Island.

Acknowledgement

The field work was undertaken as part of a project for the Department of Conservation, Rotorua.

References

- Allan H.H. 1961: *Flora of New Zealand Vol. I*. Government Printer, Wellington. 1085 pp.
Cameron E.K.; de Lange P.J.; Given D.R.; Johnson P.N. and Ogle C.C. 1995: New Zealand Botanical Society: New Zealand threatened and local plant lists. *New Zealand Botanical Society Newsletter* 39: 15-28.

Sarah M. Beadel, Wildland Consultants Ltd, Okere Falls, RD4, Rotorua

■ *Pittosporum obcordatum* in Catlins Forest Park

Pittosporum obcordatum is a shrub or small tree, mostly less than 10m tall, with slender divaricating and interlacing branchlets, and small, often heart-shaped leaves, hence its common name, heart-leaved kohuhu (Clarkson 1994). Its conservation status on the Threatened Plants List of New Zealand has been "vulnerable" but is now classified as "rare". It is found in small numbers at several sites in the North Island, mainly along the eastern side. The largest population is found in Back Valley, Lake Manapouri area, in Fiordland National Park.

Back Valley was the only recent South Island site until January 1994, when Miles Giller and Peter Wardle, while attending a Canterbury Botanical Society summer camp, found two small trees beside the new track being constructed to McLeans Falls, Catlins Forest Park. These two trees (Wardle 1994, suggests one tree with two stems) are about 2.5m tall and about 5cm in diameter and tangle up with a similar-sized *Coprosma propinqua*. It was perhaps a matter of luck that on the one hand the trees were not removed as part of the track development and on the other hand that the track led right past these two plants.

This new site is in the valley of the Tautuku river, near the confluence of the Duckaday and Tautuku Rivers. Here the river meanders across a swampy, alluvial flat with old cut-offs. To the north, rising land is covered in tall, broadleaf-podocarp forest. Upstream, along the Duckaday River, the slopes to the south and along the metalled access road much of the forest have been milled and cleared for farming. Patches of forest and second growth remain. The valley bottom, particularly along the river edge and between the river and the existing forest, is filled with small-leaved, divaricating shrubs with areas of grassland and sedgeland and belts of *Polystichum vestitum* on tall pedestals formed by the numerous cattle tracks which pug the ground throughout. *Plagianthus regius* trees stand out above the shrubland in places. Also, the occasional large kahikatea and pokaka hint at better times past. Clarkson (1994) says that *Pittosporum obcordatum* "occupies a distinctive linear habitat bordering levees, backswamps, cut-off meanders and oxbow lakes of lowland river flats in dryish climates. The habitat is variously affected by flooding, waterlogging, drought and frost-environmental stresses which effectively exclude the majority of native broadleaved species. Divaricating and other small-leaved shrubs and trees are predominant, and deciduous trees are probably more abundant than in any other lowland indigenous forest type". This description fits this site well. And possibly other sites in the Catlins area.

Pittosporum obcordatum is not an easy plant to distinguish from the numerous other small-leaved, divaricating shrubs amongst which it grows. A search by Brian Patrick, Allan and Pat Mark failed to find

additional plants, while a day in December 1994 by Barbara and Neill Simpson was similarly rewarded. With support from the Wakatipu Botanical Group, a further search was organised for March 1995. It was with some hope but little expectation that the search was continued downstream in areas not previously visited. On a small raised terrace, on the outer edge of a patch of shrubland about 200m below the original plants, another plant was found. It was larger, being about 3.5m tall and 7cm diameter. It contained a few green seed capsules. In the leaf litter close to its trunk were two seedlings between 4cm and 6cm tall so probably about one to two years old. Further out from the base of the tree (on its outer edge) dense cocksfoot *Dactylis glomerata* would prevent seedling establishment. Under the shrub canopy, the ground was virtually bare primarily from cattle trampling and browse. Some cocksfoot was removed from the outer edges to give more space for possible further seedling establishment. As with the other two *Pittosporum* plants (beside the track), *Coprosma propinqua* was growing alongside and tangled with this *Pittosporum obcordatum*.

Other associated trees and shrubs were *Coprosma rotundifolia*, *Coprosma* sp. (a) of Eagle, *Myrsine divaricata*, *Pseudowintera colorata*, *Pseudopanax anomalus*, *Cystisus scoparius*, *Coprosma rigida*, *Pennantia corymbosa*, *Plagianthus regius*, *Olearia lineata*, *Olearia laxiflora*, *Melicytus flexuosus* and the vines *Muehlenbeckia australis*, *Parsonsia heterophylla* and *Rubus schmidelioides*. A band of *Olearia ilicifolia* fringed the forest where the Tautuku river emerged on to the flat land and other plants were scattered through the shrubland.

The more obvious threats to an increase in this population are cattle, (tread and browse) and competition from dense grasses. The status of the land is Forest Park so it should not be too difficult to remove the cattle. Some management may be necessary to assist with the establishment of seedlings such as weeding of grasses and weeds from around the trees. Seed collection and growing on for replanting in this area would also be useful. Wardle (1994) makes a number of suggestions which should be followed up. Monitoring of the plants found so far is essential.

It is highly likely that further searching will discover more plants. There are still areas down stream which appear suitable but which have not yet been looked at.

The site was visited again on 26/5/95 to collect seed. The capsules were now brown, ripe and open exposing (one) two to four tiny black seeds in a sticky medium. Several seeds were put into the exposed soil around the base of both *pittosporums* and the rest taken to grow on for future return to this area.

References

- Clarkson, B. D.; Clarkson, B. R. 1994: Ecology of an elusive endemic shrub, *Pittosporum obcordatum* Raoul. *New Zealand Journal of Botany* 32: 155-168.
Wardle, P. 1994: A locality for *Pittosporum obcordatum* in the Catlins Forest Park. *Conservation Advisory Science Notes No. 85*. Dept. of Conservation, Wellington.

Neill Simpson, Department of Conservation, P.O. Box 811, Queenstown

Research Reports

■ A story about grass skirts

The grass skirt, worn by women and some men in many of the Pacific Islands, is an inexpensive, artistic approach to clothing. An alternative to cheap, mass produced clothing, the grass skirt expresses individuality, and uses locally available materials. An opportunity to conduct anthropological fieldwork (1) for 15 months on a Melanesian Island enabled us to learn about grass skirts and other clothing, both by observing and participating.

The popular image of a balmy south sea island, gentle breezes, and peaceful weather is not always accurate. Tanna, Vanuatu (then the New Hebrides) is cooled by the prevailing winds and maintains a moderate climate, particularly at around 350 metres altitude where we lived. This is an important variable, which means more rain and cooler temperatures. The rainy season runs from December through June. Indeed, from January through March, it rained every day, almost all day. Unfortunately, our 15 month sojourn included two rainy seasons, so we knew all too well about the needs for clothing that could handle the climate. Another feature was cold, surprisingly. The average low temperature during July and August was only 18.1°C, and many times the temperature fell well below that average, particularly at higher

altitudes. Clothing, then, has to provide protection from winds and cold, be able to shed heat easily, and dry quickly from the rains.

For over 2000 years Tannese men traditionally dressed with the nambas, or penis-sheath and Tannese women wore grass skirts. Beaten wood cloth, tapa, was traditionally available as a supplemental shawl around the shoulders for inclement weather. Men used a belt of tapa or of vines to support their grass or leaf nambas.

Not long after Captain James Cook “discovered” Tanna in 1774, traders brought cotton print materials for trade. The Presbyterian missionaries promoted clothing as a necessary symbol of belonging to the Church. A simple smock, large enough to accommodate all sizes as well as frequent pregnancies, became standard for women. Men adopted a “lava-lava” bunched around the waist, and cast-off trousers and t-shirts when available.

As the missionary and trader influences spread, the use of the nambas and the grass skirt declined. Significant resistance to Westernization erupted in 1941 with the John Frum “cargo” cult. Some claimed that the Tannese thought the trade goods associated with whites were produced by magic, much like their own garden and agricultural magic. The missionaries would not or could not teach about such magic. Accordingly, the Tannese thought that the boatlands of trade goods, the cargo, were being diverted to the traders. The question “how to obtain cargo?” was widely discussed, and men tried magic, such as wiring up trees as radios, throwing away all European money, and so on, in response to a mystical leader named John Frum.

In actuality, we found a more sophisticated interpretation of John Frum among the custom people with whom we lived. The Tannese culture, under great stress, was breaking apart from the changes introduced by the government, missions and the traders. The people who tried to follow their past traditions were being forced backwards. A reaction occurred, led by a mystic, John Frum, in which the missions, the government and the traders were rejected. A return to traditional ways by a large part of the population took place, including for many, a return to wearing the nambas and grass skirts. The traditional political, social, and economic patterns returned, as did use of kava, a mild intoxicant used by men only. The traditional beliefs resurfaced, although since then many new changes have occurred.

Today, only a small number continue to follow the customs of the past. The “custom John Frum” followers have a school to teach their own customs to their young, and are often in demand for their traditional wisdom and their performances of dances and ceremonies. They keep “custom” strong, and take great pride in tradition, including the wearing of the nambas and the grass skirt. The contrasting styles of clothing are symbolic of life styles, in that some of the people of Tanna are self-subsistent, not dependent upon “the system”. Most Tannese, however, have adopted some of Western culture, to create an uneasy balancing of traditional and modern, of Tannese and European, of indigenous and imported.

Flora

The rich, fertile soil on Tanna supports many trees, vines and plants. The Tannese have extensive knowledge of plants, and their properties, including use as food, medicine, or what we would term magic.

By collecting plants as they flowered, and drying them, we obtained over 200 specimens to send to the Department of Botany in Lae, New Guinea (2) for identification. The scientific names were numbered to correspond with the collection of names in the Nvhaal (3) language. These names were used to elicit the uses as stated by several informants. Wet weather made drying plants difficult. Some informants were reluctant to inform, as traditional medicine can be used negatively as well as positively. Fears of black magic and witchcraft were many. Also, the difficulties in communicating in a Melanesian language, Nvhaal, were great. Nevertheless, we learned the names for a number of plants used for grass skirts, including the following:

Scientific Name

Alpinia (Zingiberaceae)
Alpinia purpurata (Vieill.) K. Schum (Zingiberaceae)
Alpinia speciosa (Wendl.) K. Schum (Zingiberaceae)
Euodia anisodora Laut. (Rutaceae)
Euodia hortensis J.R. & G. Forst. (Rutaceae)
Hibiscus tiliaceus L. (Malvaceae)
Hornstedtia (Zingiberaceae)
Lycopodium phlegmaria L. (Lycopodiaceae)

Nvhaal Name

mahkarray
manpilpas
mannahl
nakileekill kamom
mannap, munkaynip
muwo
mahkarray
mankutu

<i>Maesa</i> (Myrsinaceae)	namup
<i>Murraya</i> sp. (Rutaceae)	nahal
<i>Sida rhombifolia</i> L. (Malvaceae)	niseebukwalee-n
<i>Sigesbeckia orientalis</i> L. (Compositae)	hennahyo
<i>Urena lobata</i> L. (Malvaceae)	tahleeluwah

In addition, we noted four plants which were not scientifically named. The Tannese names include: mahkaykaylappung, maykaykaylupwheel, matalowal, nawhetung.

Just as a wide variety of plants are used for clothing, many methods are used to treat the raw materials to produce wearable skirts. Each material has unique properties, often requiring special treatments. For example, branches from *Hibiscus tiliaceus* L. (Malvaceae), a small tree that grows along the seashore, are cut into 2 metre lengths, and are then strewn about on a coral reef for two weeks, to soften them by action from salt water, wind, and the sun. After removing the bark, the wood is split into long fibers, which are further softened on coral rock by rubbing with the palm of the hand.

Large leaves in other plants are separated into long fibres by fingernails, sharp bamboo, or wild cane. We saw one unusual implement constructed from discarded hospital needles which was used to speed this process. Five needles were fixed so one movement would carve 5 fibre strips from a leaf. Several such moves would complete the stripping of a leaf quickly.

When fibres are sufficiently separated, a vine is braided to create a belt, which would hold them together. The fibres are attached or interwoven in place. The rough skirt is then dyed, usually yellow, reddish purple and blue-green. Traditional dyes have lost popularity with the ready availability of inexpensive ones from the trade stores. These dyes last longer and are brighter in color. The patterns of colours of the skirts often express the individual creativity of the designer.

Leaves of a sweet-smelling plant, *Euodia anisodora* Laut. (Rutaceae) are often added to the grass skirt. The sweet smell of these leaves wafts in the breezes and hovers over dance grounds when a traditional all-night dance is held. The sensuous movements of custom dances are highlighted by the flowing motion of the skirts.

Wearing several grass skirts provides amazing protection from the cold. Yet the skirts shed water well, and dry quickly when soaked by tropical rains. The skirt can be easily replaced when need arises, whereas the cloth dresses, or draped calico are too expensive to be easily replaced. Further, the calico does not wash as easily, for it often mildews.

The traditional grass skirt is an attractive, yet simple, item of clothing. Useful, inexpensive in time and energy and material, and closely fitted to the environment, they are home made, and hand crafted. Few specialised skills or machines are necessary, and even girls aged seven or so begin making their own. The skirts express individuality, while imported calico, imported in quantity, leaves little room for artistic expression.

Footnotes

- (1) Acknowledgement to the National Institute of Drug Abuse (Project DA01129) is hereby made for support in the conduct of the research project. The observations described here were not part of the formal research, but would not have been possible without the assistance of the NIDA grant. Ideas expressed are our own, as are any errors.
- (2) We gratefully acknowledge the help of Michael Galore and his staff at the Division of Botany in the Department of Primary Industry at Lae, PNG, for plant identifications.
- (3) The unwritten language is one of five traditional languages (and around twenty-five dialects) on Tanna. The transcriptions of sounds were our approximations given limited knowledge of linguistics.

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■ Some observations on cold damage to native plants on Hinewai Reserve, Banks Peninsula

On Banks Peninsula, at least 14 native vascular plant species reach their natural southern limit of distribution at around 43° 53' South - species such as *Alectryon excelsus*, *Dodonaea viscosa*, *Macropiper excelsum*, *Pteris tremula*, *Solanum aviculare* and *Passiflora tetrandra*. Nikau palm (*Rhopalostylis sapida*)

is often included in this tally, but it grows on Pitt Island at 44° 18' South. Karaka (*Corynocarpus laevigatus*) is almost certainly naturalised on the Peninsula; it occurs only around known Maori settlement sites.

A few species reach their northern limits here, notably *Olearia fragrantissima*. Some other elements of the local flora seem close to their climatic tolerance on Banks Peninsula, for example, *Cordyline indivisa*, *Libocedrus bidwillii* and *Cyathea medullaris*.

Banks Peninsula is an isolated block of hill country, an island for most of its geological history, and it has intrigued me how some of these species have managed to maintain a toehold here or have recolonised from distant refugia following the vicissitudes of Pleistocene climatic fluctuations. Is it possible, for example, for nikau palm and kawakawa to have survived here during the glacials?

I live on Hinewai Reserve, in the SE corner of Banks Peninsula, at an altitude of 450m. The reserve itself extends from 20m above sea level up to 806m, and the vegetation ranges from nikau palm and kawakawa up through podocarp and beech forest remnants to a distinctly subalpine flora with snow tussock and *Dracophyllum*. We keep weather records at 20m and at 450m. Higher up we measure rainfall but not temperature. My records at Hinewai homestead at 450m started in 1988, a year ushered in by "The Great Drought". 1992 saw "The Big Snow" and 1994 "The Big Slip" above Akaroa, after prodigious rain at the end of July. This year, July 1995 has been marked by prolonged cold. All of these events had noticeable effects on native plants on Hinewai Reserve, although overall they appear to have been of minimal significance in disturbing the continuing regeneration of native woody vegetation across the whole 1000 hectares of the reserve.

Kawakawa (*Macropiper excelsum*) grows naturally about 5 minutes walk from my door, 100m lower down, under second-growth hardwood canopy along Waimako Stream. I also grow kawakawa as an indoor plant. This July, as in some other winters, kawakawa growing indoors in an unheated room showed the effects of cold in its drooping, slightly withered leaves and deflexed young branchlets, while the kawakawa outside in Waimako Stream showed no ill-effects, only 100m downslopes. Kawakawa along bush margins in Akaroa, however, near sea level, showed similar drooping to my indoor plant at 450m after hard still-air frosts, and some young leaves were blackened and killed. Otherwise both indoor and outdoor plants soon recovered turgidity and gloss.

In 1988 we germinated lots of *Solanum aviculare* from local seed and planted them along stretches of South Track with the idea of shading gorse on tracksides. They grew rapidly all summer. In June and July of the following winter, however, all the plants above 300m, which is the upper limit of their observed natural occurrence in the Otanerito Valley, died. All the plants below 300m, both natural and planted, survived. In this case, it appeared that still-air frost had not been the major cause of mortality, but rather sub-zero wind.

In ensuing winters we noted severe cold damage to both natural and planted *Schefflera digitata*, *Hebe salicifolia* and *Coprosma robusta* following sub-zero winds. The damage was largely confined to areas above 400m exposed to south and southwest winds.

July 1995 was notable for sustained low temperatures, frequent snowfalls, and a prolonged snow-lie at my 450m weather station:

Lowest screen temperature	-3.5°C	(lowest 1988-1994 also -3.5°C)
Highest screen temperature	10.0°C	
Lowest daily maximum temperature	-0.5°C	(lowest 1988-1994 0.0°C)
Average maximum daily temperature	5.3°C	
Lowest ground temperature (frost)	-6.5°C	(lowest 1988-1994 -7.5°C)
Number of days snow falling at 450m	8	
Number of days snow lying at 450m	20	
Maximum depth of snowpack at 450m	11cm	(excluding drifts)

After 4 August conditions improved; sub-zero winds ceased and temperatures rose sufficiently to cause no further damage and to allow remarkable recovery of damaged tissues, although we continued to experience still-air frosts down to -5°C on the ground and -1.0°C in the screen.

The following species displayed obvious symptoms of cold injury:

Schefflera digitata (pate or sevenfinger) - hundreds of saplings suffered collapse of all foliage, which appeared brown, shrivelled, deflexed and twisted. Damage was most widespread and obvious on unsheltered plants exposed to the south and southwest, but some saplings under tall, quite dense kanuka also showed these symptoms. In August the damaged foliage recovered remarkably, although young leaves not fully developed at the tips of stems remained withered, and the ends of many older leaflets turned blackish brown and brittle. One closely watched sapling beside West Track, emergent over gorse, lost all its leaves last winter during sub-zero blasts, resprouted from the top of its stick-like stem in the spring, and was completely defoliated again this July. Whether it rebounds again awaits observation.

As far as I know *Schefflera digitata* is the sole cool temperate outlier of an otherwise tropical and subtropical genus, so its response to cold is interesting.

Pseudopanax colensoi (orihou or mountain fivefinger) - saplings exposed to south and southwest winds showed deflexed and limp foliage and younger branchlets (Fig. 1). Winter dormancy is by no means complete in this species, just as in many others on Hinewai; still air frost often causes blackening and death of young, partly developed leaves if they are produced in autumn, winter and early spring, but the stem tip eventually simply grows out past the destroyed leaves. July 1995, however, was the first time I had seen fully mature leaves, and stems, affected. Two weeks after the cessation of damaging winds most of the saplings showed complete or nearly complete recovery, with turgidity restored to both stems and leaves. A few saplings still appeared badly wilted 15 days after the weather ameliorated. On days 16 and 17 strong dry NW winds blew, and many saplings that had looked more or less recovered, wilted badly again, suggesting that the damaged leaves' ability to conduct water and/or control transpiration was still seriously impaired.



Fig. 1. Sketch of cold-damaged *Pseudopanax colensoi*, 580m alt., Hinewai Reserve (Hugh Wilson)

On Banks Peninsula, *Pseudopanax colensoi* occurs mostly above about 450-500m, *P. arboreus* below that altitude. I have not noted any cold damage to *P. arboreus*, to date, on the reserve.

Hebe salicifolia (koromiko) - shrubs up to about 1.5m tall showed severe deflexing, wilting and browning of foliage. A week after the cessation of damaging winds nearly all the foliage had recovered, although some leaf tips turned black and brittle. In some shrubs part or all of the foliage shows no recovery 15 days after temperatures rose. Following the winter of 1994 an occasional shrub similarly affected never recovered, not even from basal resprouting.

Coprosma robusta (karamu) - many exposed young shrubs displayed severe deflexing and wilting of foliage and the outer 5cm or so of branchlet tips. In many cases virtually every shoot tip was affected. Recovery has been slower than in the species mentioned above, with many individuals looking badly afflicted 2 weeks after cessation of damaging winds. Less-affected individuals have recovered completely. Last winter an occasional shrub failed to recover at all, although some resprouted near the base from older wood.

Metcycus ramiflorus (mahoe or whiteywood) - mahoe continues to grow through winter on the reserve, and damage by sub-zero winds was largely confined to young, brighter green foliage that had not fully hardened. This foliage became briefly turgid again, and any remaining green areas recovered, but much of the cold-affected foliage turns pale yellow to white. Two weeks after the severe cold ceased, the chlorotic tissue has shrivelled. Growing points appear to be little affected. (Similar damage to young growth is also evident on *Pittosporum eugenioides*, tarata or lemonwood).

Urtica ferox (ongaonga or bush nettle) - widespread winter defoliation, partial or complete, is common in this species on Hinewai Reserve. Sub zero winds blacken and shrivel remaining foliage on exposed plants, and most of these leaves fall, but the bare branches rapidly leaf up again in the spring. July 1995 has caused rather more widespread defoliation than previously observed, including under canopies where ongaonga often remains leafy all winter. Below about 450m defoliation is much less marked.

Fuchsia excorticata (kotukutuku or tree fuchsia) - the species is fully deciduous every year on Hinewai Reserve, although leaves persist well into winter in the most sheltered places. Flowers regularly start to appear on bare wood about mid June. This year sub-zero winds shrivelled some of these flowers and flower buds. In previous years on Banks Peninsula I have seen young foliage completely shrivelled by late frosts in October, but afterwards growth simply continued out past the damaged young leaves. In autumn fully developed green foliage can be shrivelled by frost, but in places more sheltered from frost the leaves turn bright autumnal yellow before falling unshrivelled.

Carpodetus serratus (putaputaweta or marbleleaf) and *Coprosma rotundifolia* - the response of these two species interested me because of the suggestion that Pleistocene wind and cold were important selective forces in the evolution of the small-leaved divaricating habit. During this winter and in past winters both species suffered extensive dieback and some outright mortality following exposure to sub-zero winds, although most plants showed considerable ability to resprout from older wood lower on the shrub. The cold-affected foliage shrivelled and eventually dropped off and the smallest diameter twigs never recovered.

All this damage is very uneven. Severely affected *Schefflera* saplings, for example, stood adjacent to similarly sized saplings showing little or no damage. Just above my house, two *Hebe salicifolia* growing side by side showed completely different responses to what must have been nearly identical conditions in July 1994. One is now completely dead, the other completely healthy (despite being run over by a truck at the end of 1994!)

On exposed ridges above about 400m on Banks Peninsula, dramatically wind-sculptured trees such as thin-barked totara and narrow-leaved lacebark often excite comment. There is a splendid example - a whole forest of flag-shaped trees - adjacent to Hinewai above Long Bay Road near the Goughs Bay Road junction. These trees bear nearly all their foliage on one side of the trunk. The trunks themselves arch over like a flexible blade of grass in a prodigious gale, but they are permanently fixed in that position, as if frozen, with as much as three-quarters of their length horizontal with the ground. The immediate conclusion is that the prevailing wind has shaped them thus. But it is a wrong conclusion. The prevailing wind on Banks Peninsula is overwhelmingly NE. These trees seem to be pointing in the wrong direction, into the NE wind. In fact what shapes these trees is the much less common but much more significant SW wind. Sub-zero winds from this direction burn off virtually all growth on that side of the tree, so that

effective growth can only occur on the other side of the developing trunk. The effect is similar to salt-laden coastal winds, whether or not those winds are the ones prevailing at the site.

July 1995 produced relatively severe conditions of winter cold, and rather dramatic-looking damage to wild native plants. It made me wonder how close some of these species are sailing to their metaphorical exclusion zone (just as I wondered in previous years during droughts, winds and big snows, and as I shall no doubt wonder about global warming). Clearly the events I have observed to date represent only tiny ecological perturbations, producing far less significant changes than, for example, a few hundred feral goats, or a big fire, or a Miocene volcanic eruption.

I would still love to know what the vegetation of Banks Peninsula was like at the peak of a Pleistocene glacial.

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Comment

■ Plant succession and the problem of orchid conservation

Between the western rim of the Laingholm valley and Symonds's Bay lie some 250 hectares of manuka/kanuka scrub, the coastal edge of which is classical regenerating kauri gum-scrub, with *Cordyline pumilio*, *Leucopogon fraseri*, *Morelotia affinis*, *Phebalium nudum*, *Pimelea longifolia*, *Pomaderris kumeraho* etc. Some 10 years ago the owners of this land decided to survey it into 10 acre blocks and sell it off as a housing estate. In pursuance of this plan they bulldozed a series of potential roads through the area and along the top of the cliffs overlooking the Manukau harbour. Fortunately the scheme was a failure and I understand the area has now been purchased by Auckland City and included in the Waitakere Park.

In the strips bared by the bulldozers 3 endemic orchids, rare and becoming rarer appeared, and over several years multiplied: *Thelymitra aemula*, *T. tholiformis*, and *Caladenia* aff. "*iridescens*" (*calliniger*). There were of course other terrestrial orchids present (I recorded 21 species), but I am here concerned with the 3 rarities. In November 1989 the regenerating manuka was roughly 150mm high and I recorded 24 plants of *T. aemula*, 9 of *T. tholiformis* and 3 of *Caladenia* aff. "*iridescens*". By November 1994 the scrub had grown to over head-high and I found only 2 small plants of *T. aemula*, each with a single flower. The rest had gone.

It would seem that if we want to conserve these plants, a suitable area along the cliff top must be kept more or less clear. Burning is not feasible and in any case encourages the return of gorse and *Hakea*, which are not required. Mowing every 4 years or so would seem to be the answer. Whether it would be economical is another matter. In time of course (say 60 years), the scrub would mature and thin out, but by then the seed source might well be gone too (along with the writer!).

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BIOGRAPHY/BIBLIOGRAPHY

■ Ellen Blackwell, the mystery lady of New Zealand botany, and "Plants of New Zealand"

Ellen Wright Blackwell (Mrs Thomas Maidment, 1864-1952) is an early pioneer botanist who like Miss Marguerite Winifred Crookes (1898-1991) seems to have considered botanical science not so much as a profession but as a life-style. Ellen Blackwell is of course famous in New Zealand botany as co-author with R.M. Laing (1865-1941) of "Plants of New Zealand" which provided for the first time a more popular, well-illustrated and authoritatively-written account of New Zealand plants. It has provided an introduction to the study of New Zealand plants for generations of students and the general public and is a classic in New Zealand literature on biology. It is more than a botanical text for it attempts to integrate for the first time aspects of New Zealand culture (including Maori) into a botanical framework. First published in 1906 by Whitcombe and Tombs with a second revised edition in 1907 and third (1927) and fourth (1940) editions

revised by Laing. There was a fifth edition in 1949 and a reprinted "sixth edition" in 1957. A seventh edition was revised by Eric Godley and the publishers remained Whitcombe and Tombs.

Ellen appears to have spent only about four to six years in New Zealand and knowledge about her life and work is fragmentary. Some information about her life in New Zealand is recorded in Dick Scott's "Seven Lives on Salt River" (1). Mrs Mary (Mollie) E. Blackmore (1915-1991) Librarian at the former DSIR library at Lincoln also assembled data on her life and work (see 2).

Ellen was born at Northampton, England and was the sixth daughter and ninth child in John and Anna Maria Blackwell's family of eleven children. She wrote some religious books for children under the name "Grace Winter". As far as is known "Plants of New Zealand" is the only book she wrote on botany though she had a special interest in the subject. She decided to pay a visit to her two brothers William and Frank who had emigrated to New Zealand, to become acquainted with their wives and children. Laing who was Ellen's co-author of "Plants of New Zealand" was a passenger on the Omrah on which Ellen came to New Zealand, Laing having joined the ship at Naples. His visit to Naples may have been in connection with his pioneering studies on New Zealand algae (2). They reached New Zealand in 1904 and it seems quite remarkable that "Plants of New Zealand" was completed and published within two years. Ellen Blackwell stayed at Pahi on the Kaipara Harbour with her brother F.B. Blackwell, "Entranced by the New Zealand bush she set out in collaboration with her shipboard friend, Robert Laing, to produce a book that would fire the public with her enthusiasm. It was secular evangelism at its best and she enlisted her brother Frank to travel the country with her photographing and researching" (1, p.113).

Dick Scott in chapter 8 entitled "The silencing of Frank Blackwell's sister" raises the question of the relative contribution of R.M. Laing and Ellen to "Plants of New Zealand" and refers to what he perceives as a totally unjust review of the book in 1906 by L. Cockayne (3), and also refers to an article by the Rev. T.F. Robertson (4) written in defense of Ellen for what Robertson believed were unfair and unjust assessments of her contribution to the book in reviews. Robertson considered that Cockayne's review failed to recognize that the book was a joint effort. However, Cockayne (3) in the first paragraph of his review concludes, "Thanks to the laudable enterprise of Messrs Whitcombe and Tombs, a most attractive work, which cannot fail to be a factor for great good, has just appeared, written by Mr R. Laing, B.Sc., and Miss E.W. Blackwell". Elsewhere in the review Cockayne refers to, "...Mr Laing's and Miss Blackwell's admirable book..." and concludes the review, "Also, it is to be wished, that this book shall stimulate many to study the beautiful science of botany in earnest, and that by so doing 'The Plants of New Zealand' shall become a factor in the prosperity of the colony. Should these things in some measure be brought about, the authors of this pioneer work will not have laboured in vain!". Thus Cockayne clearly attributes the book to both authors and the review is in general a fair and discerning assessment which includes a fine visionary introductory statement on the significance of plant science to New Zealand. Robertson (4) on the other hand seems to give full credit for the book to Ellen Blackwell, "It seems such a short time since Miss Blackwell, to whom the chief credit of the production of this volume undoubtedly belongs, came from England to our shores..." This view would be a great injustice to Laing and as pointed out by Dr Lucy Moore (5), "...Laing alone signs the Preface in the third and subsequent editions, and that he attended to the revisions and additions that kept the book in print." Perhaps Robertson in his article was taking umbrage not so much to Cockayne's 1906 review (3) when Robertson wrote (4), "...the personal work of Miss Blackwell is very far from being so limited as the limited ideas of a few of the reviews of our Southern press would lead us to believe." Robertson would be entirely correct in taking umbrage to one anonymous southern review in the Canterbury Agricultural and Pastoral Association's Journal (6) which is headed "Flowering plants in New Zealand/by R.M. Laing, B.Sc./Illustrated by Miss E.W. Blackwell". This review clearly infers the book is by Laing alone with illustrations by Ellen Blackwell. Fifty-six years later Anderson (7) in a tribute to Laing, and quoted by Scott (1, p.119) wrote, "But it has been what is known as an open secret that the book is almost entirely the work of R.M. Laing."

Extant correspondence between Ellen Blackwell and R.M. Laing might help to resolve this question of the relative contribution of the two authors to "Plants of New Zealand". Unfortunately the letters retained in the Laing papers (MS 177) in the University of Canterbury's Macmillan Brown Library include no letters between the two authors. As pointed out by Dr Lucy Moore, Laing alone signed the Prefaces to the third (1927) and fourth (1940) editions. The Preface to the third edition frequently refers to "we" which is absent in the Preface to the fourth edition which uses "the writer" and "I". It seems likely that Laing corresponded with Ellen Blackwell regarding the new data to be included in the third edition and a notebook (Laing 11) in the Laing collection in the Macmillan Brown Library has notes on newly published data about New Zealand plants. The notes were possibly for consideration for inclusion in "Plants of New Zealand". The first page is headed "Sent to Miss Blackwell" and includes a list of genera with accompanying whole numbers and fractions and may have been an estimate by Laing of new data for inclusion in a new edition.

Under the heading "Preface" there are notes about the significance of the book for tourists, class purposes, etc. Perhaps the notes were being assembled by Laing for sending to Ellen Blackwell for her assent.

Scott (1, p.119) in his account of the Blackwells seems to suggest that Cockayne was ungentlemanly in his attitude to women and, "...it would have been certainly unpleasant [for Ellen Blackwell] to tangle with Cockayne." An episode about cross-breeding in the native flora is cited by Scott. Cockayne was certainly outspoken in his views and in some respects he followed the conventions of the early 1900s when it was considered improper to mention sex in the presence of women. Cockayne was however entirely thoughtful and generous in matters concerning women. My information comes from the personal reminiscences of Dr Moore and Dr Cranwell Smith who knew Cockayne in the late 1920s and early 1930s, and Mrs Margaret Martin (née Neumann, 1889-1988) who worked for Cockayne at the Otari Open-Air Native Plant Museum and acted as an amanuensis for Cockayne when he was virtually blind in the 1930s (8). All three had treasured memories of Cockayne. Dr Lucy Moore commented (5), "It seems hard to imagine that there was any personal animosity between Miss Blackwell and Dr Cockayne." His apparent brusqueness sometimes in conversation masked a sensitive and kindly nature.

Dr Lucy Moore discussed the aspects of Scott's book relating to Ellen Blackwell and Cockayne in two letters to me (5,9) just before she died in 1987. Lucy wrote (5), "You will be as surprised as I was to read of an 'ugly campaign' by Dr Cockayne to 'attack' Miss Blackwell. This he bases in part on Rev. T.F. Robertson's 1000-word article in N.Z. Herald Suppl. 7/7/06 which I'm sure you have had copied. Scott also refers to a lengthy review by Cockayne in Christchurch Press of 26/5/06...Scott implies, rather definitely, that Cockayne resented competition between the L. and B. 'popular' book and his own N.Z. Plants and Their Story and points out in a smug footnote that L.C.'s 'went out print after the third edition in 1927'...whereas L. and B. ran to seven editions...In the Preface to the first edition, signed by both Laing and Blackwell, 'We have to thank Dr L. Cockayne for helping us over many slippery places, and for much generous assistance freely given'. It seems hard to imagine that there was any personal animosity between Miss Blackwell and Dr Cockayne."

In her letter of 18 March 1987 (5) Lucy suggests that I discuss with Eric Godley the preparation of a short note, "...setting out a more balanced version though obviously Miss Blackwell herself vetoed any public discussion of the Robertson article." In her letter of 31 March 1987 (9) Lucy further comments about Cockayne's review (3) of "Plants of New Zealand", "I can't see how anyone reading Cockayne's review could call it scathing - it is full of praise and commendation for a job well done and fulfilling a genuine need."

As Lucy noted, Scott (1, p.119) in a footnote incorrectly states that Cockayne's "New Zealand Plants and Their Story" went out of print after the third edition (1927), whereas in fact this book ran to a fourth edition in 1967 (edited by Eric Godley). Scott in this comparison of a third edition of Cockayne's book with a seventh edition of "Plants of New Zealand" seems to be attempting to further denigrate Cockayne's work.

The first few editions of "Plants of New Zealand" note on the title page "With 160 original photographs by E.W. and F.B.Blackwell". Frank Blackwell was a photographer and Anderson (7) suggests that he helped with the indexing of the book.

"Plants of New Zealand" remains a landmark publication in our natural history literature and from this distance in time, and with our present evidence, R.M.Laing and Ellen W. Blackwell remain inseparable as joint authors. We should be grateful however to Dick Scott for providing additional biographical details about the Blackwell family in Northland, and the portrait photographs of Ellen taken by her brother Frank Blackwell on p.108 and p.117 of Scott's book are especially pleasing.

Ellen Blackwell seems to have left New Zealand about 1908 (10) and returned to England. She did not return to New Zealand and died at the Royal Portsmouth Hospital in 1952 (2).

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- (8) Thomson, A.D. 1988: Obituary - Margaret Mary Martin (née Neumann), 1889-1988. *Botany Division Newsletter No. 123*: 4-5.
- (9) Letter of 31 March 1987 from Dr Lucy Moore to A.D. Thomson.
- (10) Letter from Mrs Nancy Ellery to Mrs Mary E. Blackmore.

A.D. Thomson, Centre for Studies on New Zealand Science History, 5 Karitane Drive, Christchurch 2

■ **Biographical Notes (19): William Alexander Thomson (1876-1950)**

W.A. Thomson, dentist, company director, and horticulturist, was the eldest son of Alexander and Jessie Thomson of Dunedin. His mother, born Jessie White in Edinburgh, arrived in 1862 in the *Tamar*, while his father, born in 1846 in Linlithgow, came out in 1860 in the *Silistria*. When quite young Alexander Thomson started to learn the business of cordial manufacturing, and in 1866 founded the firm of Thomson and Co., with modest premises in Stafford Street. When he died on 24 February 1904, the "Otago Daily Times" wrote: "the business grew until it became one of the most important of its kind in the colony. Thomson and Co.'s products are known throughout the length and breadth of New Zealand, and a typical instance of Mr. Thomson's enterprise is to be found in the development of the Wai-Rongoa mineral springs, North Taieri, where the firm owns 160 acres of land and, an extensive plant for bottling the water" (1,2,3). Letterheads of the 1920s tell us that Thomson's Ltd, manufacturers of pure carbonated waters and cordials had a 3-storied Head Office at Bond, Crawford and Police Streets, Dunedin, with branches at Invercargill, Gore, Oamaru, and Wai Rongoa. The registered trade mark was a red shield with a white cross bearing the word "Purity", and this word was also the cable and telegraphic address.

Alexander and Jessie Thomson reared a family of 6 sons and 3 daughters (1). The eldest son William Alexander (Bill) and the fourth son, John Scott (Jack) became distinguished amateur botanists. They were not related to George Malcolm Thomson (1848-1933) also of Dunedin.

Bill Thomson was born in Dunedin on 28 August, 1876 (4). After living in Anderson's Bay Road on the flats at the head of the Harbour until c.1884 the family moved to Duke Street near the Botanical Gardens (5). From here Bill attended George Street School and then Otago Boys High School (1892 to 1896) playing on the First Fifteen in his last year (6,7).

After High School Bill was apprenticed to a Dunedin dentist and then studied at the Pennsylvanian Dental School and in Scotland (6). By 1903 he was back home and living in Fern Tree House at Halfway Bush, Wakari (8). This 2-storey dwelling, on the north west frontier of Dunedin, had been built in 1849 and bought by Alexander Thomson in a dilapidated state in 1898. The outer wall was of squared fern tree trunks from the original forest with clay packed in the interstices. It was renovated for Alexander by his brother-in-law, John White, who also added a much grander 2-storey brick house, completed in 1902 (2,9). Fern Tree House was to be Bill Thomson's home for the rest of his life, while the large house was occupied by his mother, accompanied from time to time by various sons and daughters.

In January, 1905, encouraged by Sidey's 1904 Dental Bill, a group of Dunedin dentists circularised their New Zealand colleagues, urging the formation of a Dental Association; and Thomson was one of a sub-committee of 6 which drew up a draft constitution and rules. In June 1905 he attended the first conference in Wellington, when the Association was formed and from which the Dental School arose. In later years Thomson was an honorary member of the staff and held most offices in the Dunedin branch of the NZ Dental Association and many important posts in the national organisation (6,10). He practised in the old AMP Building at 89 Princes Street with rooms next to Dr. Irwin Hunter whose gardener, John McIntyre, was also a friend (11).

Bill Thomson recalled (2) that one of his father's first tasks after buying Fern Tree House was to have the property ring-fenced to protect the bush remnants against wandering stock. ("It was 16 years before the seedling under-growth came away"). He also recalled grubbing gorse and planting natives, particularly beech. But as well as creating a woodland and a garden he began to explore far afield for plants, particularly with two companions from Gore, the lawyer D.L. Poppelwell (1863-1939) and the builder J. Speden (1870-1952). Examples of their joint explorations are:

- (1) 1910, Christmas holidays, Garvie mountains: a 4-day exploration led by Poppelwell, accompanied by G. Biggar and J. Speden of Gore, and W.A. Thomson and O. Davies of Dunedin (*TNZI* 47, 1915).

- (2) 1913, Christmas holidays, Garvie mountains: a 10-day exploration by the same party in a different sector. Poppelwell wrote: "I was considerably helped by my companions, all of whom are enthusiastic and skilful collectors -" (TNZI 47, 1915).
- (3) 1915, Easter, Eyre Mountains; Speden and Thomson found a novel mountain daisy in rock at the headwaters of the Moutaura River (12). Cheeseman named it *Celmisia thomsonii* (TNZI 48, 1916).
- (4) 1916, Easter (21 April): Poppelwell spent 9 hours on Long Island, near Stewart Island, and was "accompanied by Mr. W.A. Thomson, of Dunedin, who is an ardent and experienced plant collector, and he materially assisted me in my investigations". (TNZI 49, 1917).
- (5) 1916-1917, Christmas holidays, Martins Bay via the Hollyford Valley: a 10-day expedition by Poppelwell and Thomson "in company with some others". (TNZI 50, 1918).
- (6) 1917: in March according to Cheeseman (TNZI 51, 1919), Thomson and Speden collected *Veronica birleyi* "in considerable quantity at an elevation of 5000 ft. on Mount Tennyson, near Garston, Lake Wakatipu".
On 2 March 1917, at age 40, Thomson enlisted, and on 13 November embarked at Wellington for the Egyptian theatre where he served as a Trooper in the Machine Gun Squadron of the N.Z. Mounted Rifle Brigade (4). He embarked for home from Suez on 23 July 1919, and on his return married Mabel Pullen of Dunedin. In 1921 he became Chairman of Directors of the family business (6).
- (7) 1922: On 23 December, Thomson and Poppelwell left Bluff in a party of 20 on the Ketch *Water Lily* (Capt. Cross) to visit the West Coast Sounds. They landed at the Puysegur Point lighthouse and then explored Dusky Sound for several days, making collections of the plants first described from here on Cook's second voyage. Adverse winds prevented a visit to Milford Sound and they returned via Chalky Inlet and Puysegur in the New Year (13).

By the 1920's Thomson's garden at Halfway Bush was thriving. The descriptions of *Senecio mathewsii* by Petrie (TNZI 55 1924), and of *Olearia thomsonii* by Cheeseman, published post humously in the "Manual" in 1925, were mainly based on material cultivated by Thomson. And he was still adding to his collection. In WELT there are letters to J. H. McMahon of Marlborough, dated 22 October 1924, and 19 June, 1927, seeking living material.

Distinguished visitors to the garden were Dr J.P. Lhotsky (Holland) April 1925; Professor E.C. Jeffrey (Harvard) late 1925; Dr & Mrs G.E. Du Rietz (Sweden) April 1927; and Sir Arthur Hill (Kew) January 1928 (14) Also in 1928 the second edition of Cockayne's "Vegetation of New Zealand" appeared, with a photograph of Fern Tree House as a frontispiece. Cockayne recorded that the house was "now surrounded by a dense artificial plantation of various species of *Nothofagus*".

With the deaths of Cheeseman in 1923 and Petrie in 1925 Thomson had lost his main botanical advisers. To Cheeseman he had written 80 letters from 1915 to 1924 a goodly number considering his absence at the war. His contact with Cockayne appears to have started later, but by 26 April 1925, Cockayne was writing to A.W. Wastney that Lhotsky "is being well looked after by the Thomsons who in their gardens have shown him many hybrids of *Olearia* etc." (15); and in December 1925 a paper by Cockayne and Allan was received for publication containing several phytogeographic records from Thomson (TNZI 57, 1927). In WELT there are 4 letters from Thomson to Cockayne as follows: 14 August 1928, mainly about *Celmisia* and *Euphrasia*; 18 September 1931, mainly salutations, but also stating that "I am experimenting with *Celmisia* in fact for a long time now but so far have not had any success; "February 1933, a brief note including the statement that "Tapuaenuku will take up some time with you shortly"; and undated Christmas greetings. But before Cockayne's death in 1934, H.H. Allan had become Thomson's main botanical contact (reinforced later by L.B. Moore). Thus in 1929 Allan & Thomson studied a spontaneous garden hybrid between *Senecio hectori* and *S. southlandicus* (species which do not meet in nature) which had first appeared at Halfway Bush in 1915 (TNZI 60, 1930).

In November 1938, Professor Carl Skottsberg (Sweden) visited Fern Tree Cottage, and in 1939 Thomson was awarded the Loder Cup (16). In c. 1940 he retired from practice (6).

Plants that always interested Thomson were mistletoes and mountain daisies. Already in 1915, in his first letter to Cheeseman, he had described his attempts to establish seed of *Elytranthe tetrapetala* on *Nothofagus menziesii*. He concluded: "My idea is (I may be wrong) that the plant grows with the tree. I have noticed when you see a great bunch of it about 20 feet up that certainly all the seed just drops to the ground as there are seldom any branches below it." He later found a curious mistletoe on a *Coprosma* at Halfway Bush and discussed it with Lhotsky in 1925. In 1949 he described it as *Loranthus micranthus* X *Tupeia antarctica* (TRSNZ 77). Thomson's experiments with *Celmisia* involved artificial crossing of species in his collection. He reported on this at the Royal Society of N.Z. 6th Science Congress in Wellington in

1947; and he made it the subject of his Banks lecture to the Royal NZ Institute of Horticulture in 1948. This was a joint effort in which George Simpson of Dunedin spoke on the merits of our native flora as garden plants, and Thomson spoke on "The origins of some of our *Celmisiae*" (17).

In later life Thomson gave a "fine collection of books and historical articles to the Early Settlers Museum, and a fine collection of books on the early history of Otago to the Public Library" (6). He died on 17 April 1950, at the age of 73 and was buried in the Anderson Bay Cemetery (18). His grave could well have borne the words that he wrote to Cheeseman in 1915: "I get more satisfaction out of the native plants than anything else combined, and am never happy until I am off on some expedition".

After Thomson's death the property at Halfway Bush passed through several hands, including New Zealand Breweries and the Dunedin City Council (9). The situation in 1992 was that the houses and surrounding garden of Fern Tree Lodge, as it was now called, were privately owned and lived in. On the north, east and south, it remained bounded by a Bush Reserve. On the northwest and west, the City Council had retained some land and was auctioning 12 sections "nestled among mature bush and trees (protected)" in a Ferntree Residential Subdivision (19).

Acknowledgements

I am very grateful to Fiona Pitt (WELT) and Ewen Cameron (AK) for help with Thomson letters.

References

(1) Death of Mr A. Thomson *ODT* 24 Feb. 1904; (2) Historic home at Halfway Bush *ODT* 15 Oct. 1948; (3) K.C. McDonald *Dunedin* 1965; (4) N.Z. Defence Force Records and Registrar-Generals indexes; his Tombstone erroneously gives 1877; (5) *Stones Dunedin and Suburban Directory*, 1884, 1885; (6) Obituary, Mr William A. Thomson, Pioneer Botanist *ODT* 19 April 1950, with portrait; (7) Otago High School Old Boys Register, 1907; (8) *Stones Otago and Southland Directory*, 1903; (9) Lois Galer *Houses and Homes* 1981; (10) T.W.H. Brooking *A history of dentistry in N.Z.* Thomson is No. 62 in the photo of the 1905 meeting; (11) E. J. Godley *John Wood McIntyre (1850-1931) N.Z. Bot. Soc. Newsletter* June 1994; (12) Letter from Speden to Cheeseman on 7 April 1915; and letter from Thomson to Cheeseman later that year (undated); (13) W.A. Thomson, Murihiku, A visit to Dusky Sound *Otago Witness* 23 Jan. 1923; (14) A.D. Thomson Botany Division Newsletter 30 May 1980; (15) A.D. Thomson *N.Z.J.B.* 17 1979; (16) *The history of the Loder Cup, 1926-1990* 1991, with portrait; (17) Banks Lecture, 1948 [notice only] *N.Z. Gardener* 1 April 1948; (18) Death Certificate; (19) *Star Weekender*, Dunedin, 12 April 1992;

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

■ Sex and *Elingamita*: A Cautionary Tale

January 1951 produced at the Three Kings Islands exactly the sort of day that nearly 50 years before proved fatal to the intercolonial steamer "Elingamite", but allowed most of her people to get away in boats and rafts. A dense wet fog deadened noise, reduced visibility to yards and flattened the Tasman into oily swell. Just round the bluff from the wreck site Ernie Beaver backed his dinghy into the kelp and Major Magnus Johnson and I leapt into the slimy writhing mass. My leader had an MC and Bar from World War I. With only a mention from WW II, I was scared stiff. Our main difficulty lay immediately before - a zone swept clear of holds and lubricated by blue-green algae and birdshit.

"Take off your shoes," said Johnnie, "Our socks will get a grip." And they just did.

The International Code of Botanical Nomenclature had not yet followed the zoologists in establishing a Type System so I did not look round for an ideal specimen of the island's "Karaka with red berries" that my guide had collected a year earlier, and we were anxious to be away before the tide greatly changed. So all that I could reach from the top of a boulder or edge of a scarp went into one bag and, duly pickled, was handed to Martin Holdsworth with a request for a plate. I said he might have to put bits and pieces together for a perfect flower.

There was no job that Martin liked more. The son of a signwriter he drew with speed and accuracy that made his many measurement checks superfluous. He was too honest to draw anything not exactly as it was, so no composite picture appeared. What he has given us is simply mislabelled because the boss had not mentioned the possibility of separate sexes - the deficient flower range in the bag from a type tree would have made this obvious.

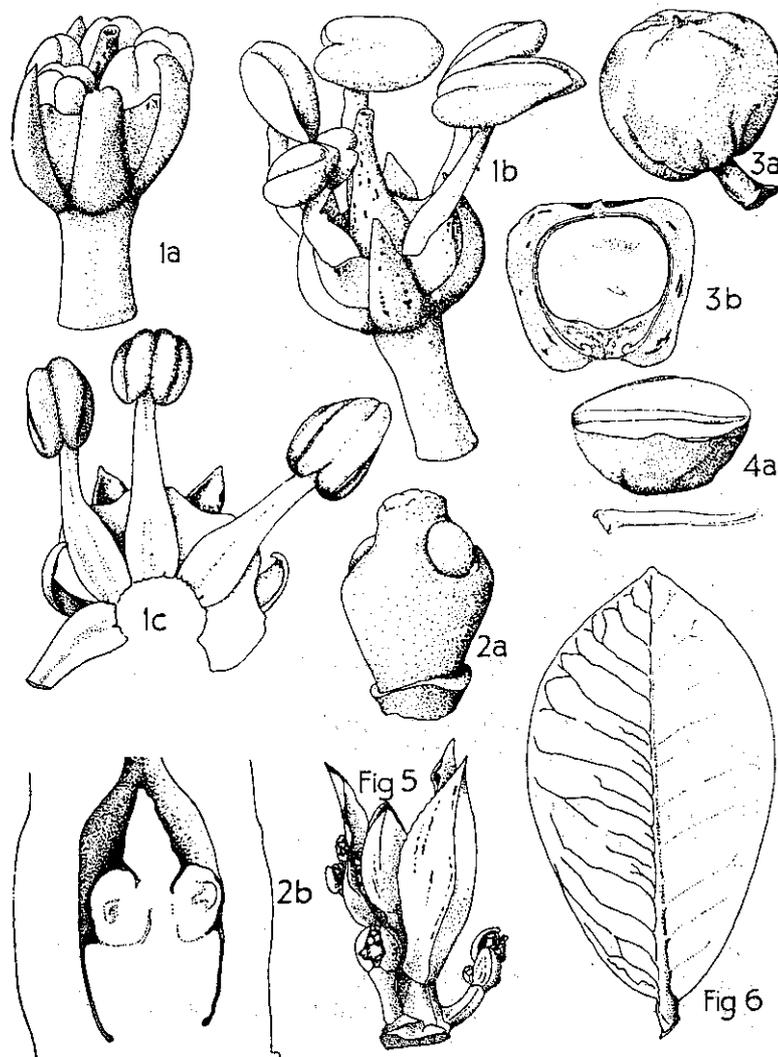


Fig. 1. Flower x 10.—a, bud; b, mature; c, portion of calyx, corolla and androecium.
 Fig. 2. Placenta x 44.—a, entire; b, in L.S. of ovary.
 Fig. 3. Fruit x 1.5.—a, entire; b, L.S. (persistent calyx not shown).
 Fig. 4. Embryo x 2.—a, in situ in the endosperm; b, dissected out.
 Fig. 5. Young inflorescence showing caducous bracts x 1.75.
 Fig. 6. Underside of leaf x 0.5.

Fig. A *Elingamita* figure reproduced with permission from *Rec. Auckland Institute & Museum* 4: 101 (1951). See text for caption correction.

All our coastal trees are precocious and Johnson with a boost of fowl manure soon had trees flowering and pointed out the *Elingamita* is dioecious. This still seems to need recording along with a correction to p. 101 of *Records Auckland Institute & Museum* 4 (Fig. A). The caption should begin - Fig. 1 Flowers x 10 - a, female; b, male; c, portion of calyx, corolla and androecium. Female flowers seem ill-developed because their staminodes never come up on filaments. But bring pollen and fruit appears quickly, glossy green for a year and then hanging long on the tree, bright red. An hermaphrodite would be the ideal patio tree, growing little in next to nothing if well fertilized and recovering without loss of a leaf from the shrivelling of both leaves and stems.

Geoff Baylis, 367 High Street, Dunedin

PUBLICATIONS

■ Journals received

New Zealand Native Orchid Group Journal 55
(July 1995; ISSN 1170-4543). Edited by Ian St George. 28pp.

CONTENTS

Editorial:

1. *Calochilus* in New Zealand. 7. *Genoplesium pumilum*

Papers:

10. Observing *Gastrodia* at Iwitahi, Trevor Nicholls.
11. *Pterostylis humilis* R.S. Rogers - an orchid with a past. ED Hatch.
13. Orchids from the 1995 revision of the NZ threatened and local plant list.

Orchid artist:

14. Audrey Eagle

Close relations:

16. *Calochilus campestris* by A.W. Dockrill

Historical reprints:

17. RS Rogers on *Pterostylis humilis*, 1922
18. D. Petrie on *Pterostylis oliveri* 1896
19. J. Lindley on *Calochilus herbaceus* 1840

Notes:

20. *Pterostylis oliveri*. 22. *Caladenia lyallii*. Scent and plastic bottles. The Orchid Man of Vanuatu. ANOSNZ show.
23. Bruce Irwin: update on the various forms of *Corybas rivularis*.
25. List of New Zealand Native Orchid Group subscribers, 1995

New Zealand Native Orchid Group Journal 55
(September 1995; ISSN 1170-4543). Edited by Ian St George. 32pp.

CONTENTS

Papers:

2. The kauri orchids. ED Hatch
5. *Caleana minor*: will it survive in New Zealand? Chris Ecroyd
13. Vagrancy within New Zealand threatened orchids. Peter de Lange, Brian Molloy
16. The Australasian genus *Drymoanthus*. Ian St George

Notes:

21. Tasks for this season. Pat Enright's field trips.
23. Val Smith on *Acianthus viridis*. Errors corrected.
24. *Bulbophyllum pygmaeum*. Are *Corybas carsei* and *C. fordhamii* the same? Bert Donaldson on Dargaville winter orchids.
25. Allan Ducker sends *Corybas trilobus*.

Orchid artist:

25. Sheila Natusch

Close relations:

27. *Pterostylis obtusa* from Australia

Australian notes:

28. Colin Bower: Pollinators: what can they tell us about the taxonomy of *Chiloglottis*?
30. Third Australasian Native Orchid Conference, Adelaide, 1996.
New Australian "aff." species.
31. Iwitahi 1995.

■ Threatened plant poster

A full-colour poster featuring 25 of New Zealand's threatened plants has just been published by Manaaki Whenua Press. The illustrations are by Sabrina Malcolm and the text by Peter Johnson. Copies can be obtained from Manaaki Whenua Press at P.O. Box 40, Lincoln @ \$12.00 each (or \$7.00 each for five or more copies).

Editors

DESIDERATA

■ *Nothofagus* collection at Royal Botanic Garden, Wakehurst Place

Wakehurst Place the satellite garden of Kew in England has established a national collection of *Nothofagus* species. This includes all species that grow outside southern England. They currently have provenanced material of *Nothofagus solandri*, *N. fusca*, and *N. menziesii*.

They are looking for hardy provenances of the above species plus seed of *Nothofagus truncata*, and *N. solandri* var. *solandri*. If you have seed or are collecting this autumn please contact me. I have agreed to co-ordinate collection.

Mike Oates, Wellington and Otari Botanic Gardens, Wellington City Council, Box 2199, Wellington

■ Nikau seed and seedlings wanted

For a proposed study of morphological variation in nikau (*Rhopalostylis sapida*) for an MSc by Fritha Storker, ripe fruit (preferably with red flesh) and small seedlings are required from known localities. About 10 seedlings and 20-30 seeds randomly chosen from each site would be ideal. Please send material with collection details to me at the address below.

John Braggins, School of Biological Sciences, University of Auckland, Private Bag 92019, Auckland

BOOK REVIEW

■ Index Kewensis on CD-ROM

For the last two years I have been employed in the Auckland Museum herbarium (AK) to code and database existing herbarium specimens. More recently I have been doing similar work with the Auckland University herbarium (AKU). One of the time consuming tasks is to enter taxa and their correct authorities onto the database (which currently numbers over 15,000 taxa, including over 3700 genera).

Until recently, botanists working in the field of taxonomy have had to rely on a set of volumes named Index Kewensis (IK) as the definitive work for the names and authors of all gymnosperms and angiosperms. IK was first published in 1893, with supplements being published every five years since. All in all there have been nineteen supplements published, but the CD (published 1993) is the first time the entire IK catalogue has been amalgamated.

Searching for names using the 19 supplements plus the original was an extremely laborious process. If you knew the date of publication then you could generally reduce your search to only a few volumes. If, however, you had little or no information about the name then you would have to search through the entire series i.e. 20 volumes. This, as you can imagine, can become quite tedious.

With the advent of the CD-ROM (Compact Disc - Read Only Memory) IK has not only become easier to use, but with the cross-referencing and search options that are available it is far more useful than the printed version ever was. We can now search on up to ten parameters i.e. family, inframily, genera, infragenus, species, infraspecies, full author, author, publication, and notes. On top of that we can use wildcards and boolean operators to search when we only know part of a word or are unsure of it's spelling (this is a great help as spelling mistakes on herbarium labels are frequent).

IK was put onto CD by filming the printed version and then reading it with an optical character recognition scanner. Therefore, it should be realised that the CD is not actually an updated copy of IK, but a collection of all the volumes and supplements into one. Because of this the CD retains some of the constraints of the original printed version. The main problems are:

1. The publication date was not given for each record until Supplement 4 (which covers the period 1906-1910).
2. Only infra-specific taxa (i.e. subspecies, variety, or forma) published after 1971 are included.

3. Until Supplement 14 (which covers the period 1971-1975) abbreviated latin names were used for countries, which makes many of them very difficult to interpret e.g. Afr. Luist. Or. = Portuguese East Africa (now Mozambique).
4. The presentation of authors names is not consistent e.g. Linnaeus may be cited as L., Linn., or Linnaeus.

However, some corrections were made during the data transfer process, and all future editions will apparently be constantly upgraded. Standardising author citation to conform to Brummit & Powell (1992) will greatly improve the CD.

Another aspect that should be remembered when using IK is that it is only an index of all published plant names, whether they are valid or not. As the manual for the CD (1993) points out IK is "...not a list of accepted names, nor are all the names in it validly published." Also, IK does not prioritise names for the same reasons given above. In the CD version it quite often provides a synonym or basionym in the note line, but it is usually unclear which it is. Because of this it is wise to use IK in conjunction with up-to-date floras as these tend to be more precise. IK can quite often provide a good starting point when referencing a taxon.

IK has a few idiosyncracies which can take some time getting used to. I have provided here some examples of plants found in New Zealand and the problems encountered when searching for them on the CD:

- *Agathis australis* comes up with the authority Steud. on IK while the valid authority is (D. Don) Lindley - which is not even given as an option on IK.
- *Gnaphalium purpureum* L. var. *ustulatum* (Nutt.) J. Boivin is not on IK but there is a record of *G. ustulatum* Nutt. which has =*purpureum* in the note line.
- *Myosotis colensoi* has the correct authorship of (Kirk) J. F. Macbr., but IK provides two different records, one with the authority as Macbride and another as Cockayne & Allan.
- On searching for *Osmanthus fragrans* to see if there was a var. *aurantica*, IK couldn't find any records. However, after a little digging, an *O. auranticus* was discovered which, it turned out, had *O. fragrans*, var. *aurantiacus* written in the note line.

All in all Index Kewensis on CD-ROM is an incredibly useful taxonomic tool which can save a researcher many hours of fruitless searching through countless books. I estimate that the CD-ROM has saved me up to 4 hours work per week that was being spent searching through varied floras and the printed version of IK. It is quite an expensive tool at 1000.00 pounds UK, but if you are doing a lot of taxonomic research, especially into obscure taxa, then it should shortly pay for itself. Updated versions of the CD will be put out regularly which will cost considerably less once you've bought your first copy. It is likely that there will be no more IK supplements printed and therefore it will be necessary to have access to the CD to stay up-to-date.

References

Brummit R. K. and Powell C. E. (eds.) 1992: Authors of Plant Names, Royal Botanic Gardens, Kew.
Index Kewensis on Compact Disc Manual 1993: Oxford University Press, Oxford.

For more information about IK write to:

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