Botanical Society of Otago Newsletter.

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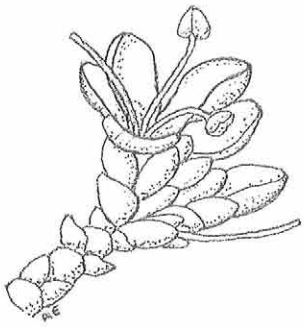


BSO Meetings and Field Trips

14th **February**, Wed, **7pm. Annual General Meeting.** Guest speaker Prof William Bond, Cape Town University, South Africa: **"Divaricating plants – defence against toothless browsers ?"**. Supper. Zoology Annexe Seminar Room, entry through the side door behind the car park, Gt King St., from 6.45 – 7 pm.

17th **Feb**, Sat, Full day trip, to explore and to update the 1985 plant species list of a 57 ha forest remnant on the Kennedy farm just south of Taieri Mouth,on the road to Waihola. Helen Clarke, QE II trust, will lead this trip. On the way there will be a stop to examine a small area of salt marsh on the north bank of Otokai Creek at Brighton. It is the middle part of the salt marsh area which can be seen from the coastal end of McIntosh Rd. Meet 9am, Botany Dept car park, 464 Gt King St. **Bring your *Acaena* key**! Car pool costs: 7c/km/passenger, to be paid to driver.

21 March, Wed.7**pm. Highlights of the Summer Field Trip in Fiordland.** Slides by Audrey Eagle and Rory Logan, photo displays by Robyn Bridges, Moira Parker and any one else who wishes to bring them! Supper. Zoology Annexe Seminar Room, as above.

25 March, Sun. Kelvin Lloyd will lead a full day field trip to totara-dominated forest in **Awakiki Bush Scenic Reserve** and to nearby **Otanomomo**, south of Balclutha. Meet 9am, Botany Dept car park, 464 Gt King St to car pool. **Bring your *Acaena* key**! More details page 20. Car pool costs as above.

29 April Sunday afternoon. **Varleys Hill**, Otago Peninsula, between Hoopers and Papanui inlets. A QE II covenant belonging to John and Moira Parker. **Meet 1 pm** at Botany Dept car park, 464 Gt King St, to car pool, or at 1.30 pm at Hoopers Inlet Hall. More details next newsletter.

Contact details for any enquiries are inside the back page

Notes from Branch Office

The year has already got off to a good start botanically, with the summer field trip at Borland Lodge attracting a total of 48 enthusiastic participants from as far afield as Tauranga, New Plymouth, Nelson, and Christchurch. The botany was as diverse as the people, as you will see from the trip reports printed here, and from the slides and photos that will be on display at our March meeting.

Next up is the AGM on 14 Feb. Do come and add your suggestions for the year's activities. The current acting office bearers: Chairman - Bastow Wilson; Secretary - Ralf Ohlemueller, Treasurer - David Orlovich and Newsletter Editor Allison Knight have all indicated that they are willing to stand for 2001, but there is still room for more enthusiasts on the committee.

Our calendar is already starting to fill up with a wide range of interesting field trips and speakers. We have also been working on a draft constitution for your approval at the AGM. Anyone interested in seeing it beforehand is welcome to get a copy from Bastow.

Wishing you the best of botanising for 2001.
Bastow and Allison

Cover picture

Hebe annulata, flower detail, approx. 4 x natural size, sketched by Audrey Eagle. Finding this rare Hebe in flower on a high saddle in the foothills of the Takitimu Mountains was one of the highlights of this summer's Botanical Societies' field trip. Audrey has placed the specimen she drew in the Otago Herbarium (OTA).

Specimens for the final volume of Eagle's "Trees and Shrubs of New Zealand"

Audrey is pleased to advise that she has completed illustrations of another 5 plants from specimens received this summer, so the following can be removed from her request list:

Pittosporum Kermadec Island form
Olearia virgata ssp. *centralis*
Rubus schmidelioides var. N. W. Nelson form
Coprosma ciliata Eastern S. I. form
Coprosma pseudocuneata S. I. Form

REPORTS FROM THE OTAGO AND WELLINGTON BOTANICAL SOCIETIES' SUMMER FIELD TRIP.

This 10 day field trip was based at Borland Lodge, on the eastern boundary of Fiordland National Park, between Lakes Manapouri and Monowai. It ran from 29 Dec – 7 Jan, and the weather was a diverse as the botany and the botanists, ranging from skiffs of snow up on the tops of Mt Burns on the first outing to a warmly welcoming 30° C in sunny Invercargill. Reports of botanical interest follow, with more to come next issue.

Pukerau Red Tussock Reserve, "Burwood" Tussock Reserve and Redcliff Wetland Reserve. (29 Dec & 7 Jan) - *Allison Knight*

Those who joined the convoy from and to Dunedin were treated to some interesting stops long the way. At first sight the remnant lowland plant community in Pukerau Reserve looked to be mainly red tussock (*Chionochloa rubra* ssp *cuprea*) and wire-rush (*Empodisma minus)*. Closer inspection soon had Gael and Val exclaiming over the number of different orchids in flower. Bastow's revelation that the peat was over 6.5m deep here, the deepest measured in Otago, and his question as to whether the *Sphagnum* or the *Empodisma* was the main peat-forming organism in New Zealand bogs provided something to ponder over for the rest of the trip. A highlight for me was finding several lichenised *Omphalina* in fruit. They are among the few lichens from the class Basidiomycetes, or toadstool fungi.

The second reserve was just west of Mossburn, beside the road to Te Anau. This montane hillside tussock community also contained a variety of orchids. There were many clumps of *Aciphylla glaucescens*, with their striking blue-green foliage and tall yellow flower spikes.

On the return journey we made a brief stop to look down at the Redcliff Wetland Reserve, where ponding has been re-introduced as a sanctuary for wildlife Then next stop was at Arne Cleveland's Pukerau nursery, where there were a great many native plants to admire and covet.

Green Lake Landslide, Fiordland.

By Audrey Eagle

This landslide is believed to be the largest of its type on earth. Because of the lush growth of forests in Fiordland the landslide was disguised and it was not until 1976 that a geologist, Roger McPherson, recognised it as such. In 1994 it was fully documented by G. T. Hancox and N. D. Perrin.

The immense size of this 9 kilometre long landslide was appreciated by our members when viewed from a high vantage point on Mt. Burns, a part of the Hunter Mountains. The valley floor was seen to be covered in a series of rounded and pyramid shaped bush clad hills of fallen rock, between which were large boggy areas and tussock grassland. It spreads over an area of 45 square kilometres, filling the valley to a depth of 800 metres with some 27 cubic kilometres of rock debris, comprising semi-intact blocks.

The original large lake was filled and new lakes formed, the largest being Green Lake in the South. In the North is Pyramid Lake and Island Lake is in the centre of the valley. Water from the original lake flowed southwards into Lake Monowai, this exit was blocked and the flow reversed, and now the catchment flows northwards into Lake Manapouri.

This catastrophic collapse of a substantial part of a high mountain range occurred when the glaciers were retreating between 12,000 and 13,000 years ago. Geologists have found that the land broke away along a fault zone because it had been undercut by a glacier and was no longer supported by it. The final trigger was probably a large earthquake on the Alpine Fault off the coast of Fiordland.

This dramatically changed landscape is truly inspiring. And one doesn't have to climb a mountain to see it, as the 12 kilometre road from the Lodge goes right up to the Borland Saddle from whence a good view of part of the valley can be obtained.

Reference

Hancox, GT , Perrin, ND. (1994) Green Lake Landslide: A very large ancient rock slide in Fiordland, New Zealand. 7th International IAEG Congress, Balkema, Rotterdam. pp 1677-89.
For more information email: g.hancox@gns.cri.nz, and for stunning aerial colour photos of the landslide see: http://www.gns.cri.nz/earthact/land_stab/greenl.html

Manapouri, Hope Arm and Back Valley (1 Jan) – *Jill Goodwin*

The organising committee had arranged a wonderful highlight for our first day of the new year - various combinations of boating across and walking beside beautiful Lake Manapouri.

We all drove to Manapouri, and from 9:00am some went by launch to Hope Arm to walk back, others got one of several sailings of the ferry across the Waiau. Some walked in to Hope Arm and boated back; some walked the long loop: Manapouri - Back Valley - Hope Arm - Manapouri; and some did various walk-in-and-back options.

The group I was with walked in to Hope Arm, taking the Lake track, not the longer Back Valley track. We enjoyed the very pleasant walking conditions alongside the river, beside the lake, and over an extensive boardwalk system. We walked through beech forest, mixed with a great variety of other vegetation.

The general appearance of the beech forest was extremely variable; sometimes the floor was thick with *Blechnum* ferns, sometimes it was a vast humpy field of mounding moss, sometimes there was a thick cover of beech saplings and sometimes the floor had a rich variety of other shrub and tree species.

The 3-wire bridge and the rotten-log-bridge were a bit of a challenge, but we reached the Hope Arm Hut in plenty of time for the boat rendezvous at 4:00pm.

While we had been sheltered in the bush, the wind had picked up, making it impossible for the boat to land at the usual place. After much arm-waving and shouting between ship and shore, we sidled around the lake shore to a smaller, more sheltered cove, where the boat was able to pull in safely. The white-capped lake gave us a very bumpy ride back to Manapouri, between steep-sided hills dropping straight into the water, around islands splashed with red rata, and then slowly up the broad dark water of the Waiau River.

For me, the highlights of the day were more touristical than botanical, but others listed these botanical highlights:

Val: Lots more orchid species than expected.
Moira: The tall *Plagianthus*, Kowhai and Kaikomako in the grove.
Ros: The large areas of 'mounding mosses' under the beech trees.
Several: The 3-wire bridge!
Chris H.: *Aristotelia fruticosa* (shrubby or mountain wineberry); *Melicytus flexuosus* (leafless porcupine plant) - a strange plant, with variable leaves; the variety of bush in the various understories; a 20m+ *Plagianthus regius*; 18m *Cordyline australis*; *Alepis flavida* (yellow mistletoe) in mountain beech, on the way down to the jetty.
Allison: Finding the newly re-named *Coprosma pedicillata* (=C "violacea"), just as Neill Simpson predicted we should.

Clifden Limestone (3 Jan) – *Pat Enright*

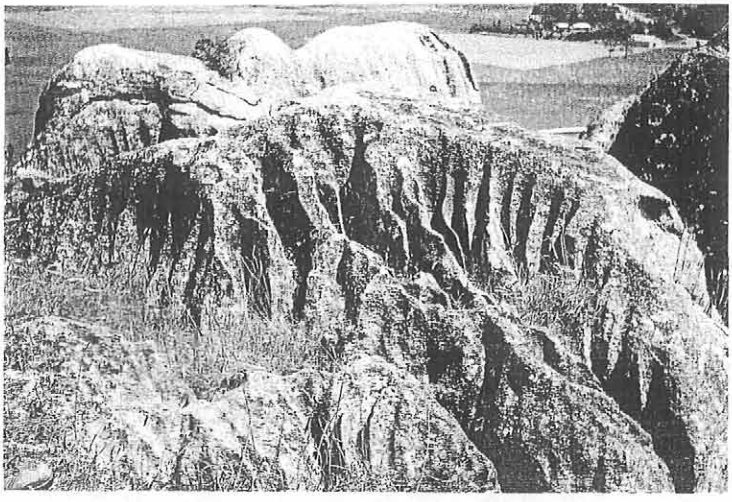
On a lovely hot typical Southland day we botanised two limestone areas near the Clifden Historic Bridge. The day started slowly with a walk across the golf course and then the fun started. Led by a couple of intrepid pathfinders we bashed around at the base of the limestone bluff looking for a way to get up onto the top. There was a diversity of ferns at the base of the limestone scarp, mainly *Blechnum chambersii*, with maidenhair (*Adiantum cunninghamii*), hen & chicken (*Asplenium bulbiferum*) and others. The botany was interesting without being too exciting but once a short break was called near a more open seasonally wet area, species numbers and variability increased with several orchids and a small *Raukaua simplex* being noted.

The party then split with a group walking along the fenceline to get easier access up onto the top of the escarpment. This was mostly beech with an interesting understory of sedges and ferns. *Blechnum discolor* being particularly common. The descent was made outside the fenceline where the mistletoe *Tupeia antarctica* was seen on ribbonwood (*Plagianthus regius*) and *Ileostylus micranthus* on mingimingi (*Coprosma propinqua*), perhaps protected from possum depredation by the somewhat isolated nature of the trees. Of note also were a very large specimen of *Myrsine divaricata*, a specimen *Coprosma rubra* spotted just over the fence and a few *Olearia fragrantissima* plants.

After a leisurely lunch inertia seemed to have set in for a while but eventually a straggling procession made its way to the bush area on private land above the river. The main attraction here was the presence of both *Olearia hectori* and *O. fragrantissima*. Seeing them both together helped reinforce the difference between the two species, the zigzag branches of *O. fragrantissima* being the main determinant. *Tupeia antarctica* was seen growing on one of the *O. fragrantissima* trees. A large flowering specimen of *Aciphylla subflabellata* was also a notable find as was a plant of the rare sedge *Uncinia strictissima*. Concern was expressed about an exotic *Sedum* sp., which was noted growing on a number of limestone ledges. A specimen was taken for identification purposes.

Some of the group then made their way down to the beech forest beside the river where a number of *Gastrodia cunninghamii* plants were in full flower. These were heavily scented and the perfume permeated the air. Funnily enough some people could not detect the perfume and other comments ranged from it being delightful to rather cloying and unpleasant. Down on the river edge we were greeted with a lovely rata tree (*Metrosideros umbellata*) in full flower.

Overall another very enjoyable day of good company and good botanising.



Clifden Limestone. Photo by Robyn Bridges

Eldrig Tops (4 Jan) – *Les Moran*

Fourteen renegade members forsook the flatlanders botanising option and headed for the tops around Eldrig Peak this sparkling day. The Eldrig Tops track was accessed from the pylon road after diverging from the main road in the South Branch of the Borland Burn. Leaving the vehicles at about 560 metres above sea level we began a steady ascent through a diverse shrubland; the aftermath of clearings under the pylon line. Here Gael highlighted for us the differences between two blue sun orchids, *Thelymitra pulchella* and *T. cyanea*, which are outwardly rather similar.

After critical appraisal, *Raukaua* (previously *Pseudopanax*) *edgerleyi* quickly became *R. simplex* in all its guises. Similarly, *Olearia lacunosa* transmogrified into a very faintly-toothed *Pseudopanax crassifolius* (lancewood) that at higher altitudes revealed itself to be unequivocally *P. linearis*! Learned botanisers, beware. The leached gley soil over coarse crystalline granite rock meant that some species took on unfamiliar growth forms.

On reaching the first saddle the bush had a quasi-'gremlin forest' look, a further reflection of the thin layer of peat over basement rock and a perched water table. The eight metre high canopy of *Dracophyllum longifolium*, interspersed with *Halocarpus biformis* (pink pine) and mountain beech, was pierced by emergent wannabe 'cedars'; giant *Leptospermum scoparium* (manuka) emulating round-topped kaikawaka. Throughout this zone the flowering mistletoe *Alepis flavida* was abundant on mountain beech at all storey levels.

From the forest we broke out among granite tors nestled in their gritty sandpits. Here the common 'smalls' were struggling – *Pentachondra pumila*, (a dwarf heath), *Dracophyllum pronum*, *Oreobolus* sp.(alpine sedge), *Styphelia empetrifolia* et al. Views from the tors out across the saddle revealed a 3 to 4 metre canopy mosaic of open tree and shrubland dominated by pink pine and mountain beech. Of the tussocks, *Chionochloa rubra* held sway here.

The bogs in the saddle were crowded with the cushion mat, *Donatia novae-zealandiae*, the mat sedges, *Oreobolus stricta* and *O. pectinatus*, the beautiful narrow-petalled sundew, *Drosera stenopetala* and the wee pygmy pine, *Lepidothamnus laxifolius*. A streamside garden displayed bouquets of *Celmisia coriacea* and *C. petrei* nestled in a pretty setting and flanked by the red mid-ribbed *Astelia nervosa*, the robust pineapple scrub *Dracophyllum menziesii*, bright green *Hebe odora* bushes and the yellow-flowered alpine daisy *Dolichoglottis lyallii*, all underpinned by a carpet of tangle fern, *Gleichenia dicarpa*. Here and there the bog twinkled with the white flowers of *Oreostylidium subulatum*.

Beyond the tree line the curly-topped *Chionochloa teretifolia* dominated. *Caladenia lyallii*, (ahh that beautiful gland) was everywhere in flower. (Ian St George notes that New Zealand's first collection of *C. lyallii* was from Otago, by Dr David Lyall, surgeon

on the *Acheron* –he must have got about *ed.*). Well ordered 'mini pineapple plantations' of *Celmisia lyallii* spiked the tussock land but many showed evidence of a 'harecut'!

At about 1200m the granite tors outcropped again; huge jumbled dice sculptured into fantastic shapes, many with basins of fresh water notched into their flanks. Craig Potton, eat your heart out. And now a whole new suite of plants appeared: *Geum uniflorum* with its large buttercup-like white flowers, *Ourisia sessilifolia*, sprawling *Celmisia walkeri*, brown furry edge leaved *C. traversii*, the semi-woody branched and trailing *C. ramulosa*, whipcord *Hebe hectori* and mossy cushions of *Chionohebe thomsonii* and *C. ciliata*. The surrounding granite sand desert was studded with jewels of white-flowering *Hectorella caespitosa* and contrasting red-tinted *Luzula rufa*.

At this point some of the party headed for the grand views from the higher Eldrig Peak main ridge, while others drifted away down to the large tarn tucked under Eldrig's eastern slopes. Highlights here were *Aciphylla pinnatifida* with its bright orange bracts and yellow leaves poking out from snow groomed tussocks and seeps. Evident, too, were the succulent-like leaved *Euphrasia integrifolia*, the clumpy *Aciphylla crosby-smithii* and one stunning *A. congesta* cascading over a bank and topped with crowded flower heads. Other gems included *Gentiana montana* displaying pink-striped white petals, *Celmisia* sp flowering in profusion and *Ranunculus lyallii* popping its white flower heads out of the tussock on all sides.

Scenically and botanically the day provided a glorious eyeful for all of us. Comprehensive species lists of vascular plants were compiled by Graeme Jane and Gael Donaghy, with the able help of Southern Botanic Man Geoff Rogers.

Alpine daisies (*Celmisia* sp) and forest ferns (*Blechnum discolor*). Photos by Robyn Bridges

Otatara (5 Jan) – *Joyce Wilson*

The day, I was told, was a typical Southland day, calm and hot 26 -30° C. Our destination was Otatara, Invercargill, with three sites of Botanic interest to explore.

Bushy Point Boardwalk

Bushy Point Educational Boardwalk was a delight. Ian and Jenny Gamble have protected their forest with a QEII National Trust Covenant and have created a boardwalk through tall forest, manuka shrubland, wetland and estuary rushland. This area was previously grazed, and since this was stopped ten years ago, and eight hundred possums and 80 wild cats were eradicated, regeneration has been considerable. The boardwalk was constructed because very high tides come in to the area, occasionally almost to the home.

Forest plants seen included *Pseudopanax colensoi, P. crassifolium, Elaeocarpus hookerianus* (pokaka*) Coprosma grandifolia, C. rotundifolia, C. foetidissima, Melicytus lanceolata, Astelia fragrans, Podocarpus totara, P. hallii* and various hybrids of the two totaras, *Fuchsia excorticata, F. perscandens* and *Fuchsia* hybrids, *Aristotelia serrata, Dacrydium cupressinum* (rimu) and *Prumnopitys taxifolia* (matai). The ground cover was largely *Microsorum (=Phymatosorus)* fern species, *Astelia fragrans* and numerous seedlings of *Parsonsia capsularis*, the native jasmine.

Closer to the sea, the scrubland consisted largely of *Leptospermum scoparium* (manuka) on which was found the tiny dwarf mistletoe, *Korthalsella salicornioides*. Also present were *Coprosma propinqua* with the green mistletoe *Ileostylus micranthus*, and *Plagianthus divaricatus* (saltmarsh ribbonwood).

Towards high tide mark were grasses, the rare spiky hair-grass, *Deschampsia caespitosa*, and the introduced tall oat grass *Festuca arundinacea*, both in flower. *Leptocarpus similis*, the jointed wire rush, was very abundant. Saltmarsh herbs found included the coastal turf plants *Selliera radicans* and *Samolus repens*, as well as the native celery or shore parsley, *Apium prostratum*.

Bushy Point illustrates very well the lowland coastal zonation from forest to manuka scrub to salt marsh. A highlight was a very close encounter with a very curious fernbird.

Threatened Plant Garden

The next visit, to Brian and Chris Rance's Southland Threatened Plant Garden, was just up the road. Brian is a Botanist and Chris a horticulturalist and both have a passion for NZ flora. This garden is their 'hobby'. It was a rare privilege to see, without the effort of strenuous field work, all these rare and beautiful plants. They included *Clianthus puniceus* from East Cape, *Pittosporum dallii* from Nelson, the native brooms *Carmichaelia (=Chordospartium) stevensonii* and *C. muritai* from the top of the South Island, *Acaena rorida* from the Kaimanawa Ranges and *Hebe speciosa* from Nelson and Northland.

Continued on page 15

A Key and notes for *Acaena* (Rosaceae) in New Zealand

By Kelvin Lloyd

To the untrained eye, species of *Acaena* (bidibids) can appear confusingly similar. The most recent key to NZ *Acaena* species was provided by Bryony Macmillan in Volume IV of the Flora of New Zealand series (Webb *et al.*, 1988). Six new indigenous species of *Acaena* have been described since 1980 (Macmillan, 1983; 1985; 1989; 1991) and four of these (*A. emittens*, *A. juvenca*, *A. rorida* and *A. tesca*) were described too late for inclusion in the 1988 key. A new key to the genus appears warranted.

Acaena is a genus of perennial herbs or dwarf shrubs, which are often prostrate and mat-forming. *Acaena* leaves are imparipinnate (*i.e.* two rows of leaflets on either side of the midrib, plus one terminal leaflet) the leaflets are toothed, and stipules persist at the leaf bases. Flowers have a calyx of 3-5 sepals but no petals are present. Flowers and fruits can be arranged along a spike or in a capitulum (compact spherical seed head). The dry fruits are enclosed within a hypanthium which generally bears four spines (frequently barbed), but spines may be absent. Habitats include open places, dunes, grassland, shrubland and forest. *Acaena* species can be found throughout New Zealand, from near sea level to 1850m in altitude. If the subantarctic islands to the south of the New Zealand mainland are included, 18 *Acaena* species (16 indigenous) are present in the New Zealand region, representing four taxonomic sections of the genus.

Hybridisation is relatively common between species of *Acaena* (Dawson, 1960; Webb *et al.* 1988. The widespread *A. novae-zelandiae* is frequently one of the parents. It hybridises both with species from its own section (sect. Ancistrum) and with section Microphyllae species. *Acaena* hybrids may be conspicuous and vigorous, and can be difficult to key out. For example, hybrids between *A. novae-zelandiae* and *A. microphylla* var. *pauciglochidiata* appear vegetatively similar to the latter, but capitula are supported by longer stalks and bear more fruits, with barbed spines, as in *A. novae-zelandiae*. The parent species can usually be found in the same vicinity as the hybrids

Some *Acaena* species are very widespread, while others are restricted to particular regions or habitats (Table 1). The Otago region, with 14 species, is a centre of diversity for *Acaena* in New Zealand. Look around and you'll be bound to find them, and please test the key out!

Table 1. Distribution and habitats of *Acaena* species in New Zealand region. (information from personal observations, Webb *et al.* 1988; Macmillan 1989; 1991)

Species	Distribution and typical habitat
A. agnipila	Scattered through North Is. and eastern South Is. Dry short grassland, riverbeds and waste places up to 900m alt.
A. anserinifolia	Very widespread in NZ. Margins of forest and shrubland, beside tracks and streams, coastal to low alpine.
A. buchananii	Eastern South Is. from Marlborough to Otago. Lowland to montane short dry grassland and turf, mainly in inland basins.
A. caesiiglauca	South Is., east of main divide. Montane to alpine tussock grassland and scree margins
A. dumicola	Eastern South Is. from Awatere Valley to Eyre Mountains. Shady sites (beneath shrubs, beside rocks) in grasslands.
A. emittens	Central North Is. south of L. Taupo. In shrublands and beech forest from 450-1500m alt.
A. fissistipula	South Is. Montane to alpine grasslands and herbfield, often beside streams and seepages
A. glabra	Eastern South Is. from Marlborough to North Otago. Shingle and scree margins, 600-1750m alt.
A. inermis	Central North Is. Widespread in eastern South Is., occasionally in west. Montane to alpine grasslands and riverbeds.
A. magellanica	Macquarie Is. Gravel, herbfield and fellfield.
A. juvenca	Lower North Is. and eastern South Is. Open forest, forest margins, shrublands and grasslands. Coastal to 1200m alt.
A. microphylla	var. ***microphylla***: Central North Is. Grassland, river terrace, 500-1300m alt. var. ***pauciglochidiata***: Coastal Otago, Southland and Stewart Is.Grassland, river terrace, gravel and sand. Coastal to 900m alt.
A. minor	var ***minor***: Auck. Is. and Campbell Is., coastal to mid-altitude slopes and bird colonies. var. ***antarctica***: Antipodes and Macquarie Is., high altitude meadows.
A. pallida	Wellington Harbour, Otago Peninsula, Bluff, Stewart Is. Coastal sand dunes.
A. profundeincisa	North Is., South Is. Montane to alpine grassland and shrubland.
A. rorida	NW Ruahine Range, North Island. Limestone ravines and tussock grassland. Known from only one locality.
A. saccaticupula	South Is. Mainly eastern, montane to alpine herbfield and fellfied.
A. tesca	Otago, almost exclusive to schist bedrock. Upper slopes of block mountains, often in damp sites.

Many *Acaena* species can be distinguished by their vegetative characteristics alone. The following key makes extensive use of these, as plants encountered in the field may not be in flower or fruit. Species known to be naturalised in New Zealand are indicated in the key by asterisks. The key has a dichotomous structure, with the two leads of each couplet

aligned vertically. **Feedback on the key is welcomed! Please contact Kelvin Lloyd, Landcare Research, Private Bag 1930, Dunedin, email: lloydk@landcare.cri.nz.**

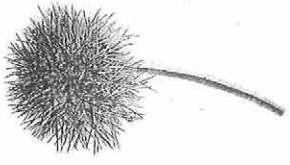
A Key to *Acaena* in New Zealand

Branches erect in tight clumps
- Leaflet teeth sharp-pointed; flowers and fruit in short to long spikes
  - Spines of fruit ± equal, all lacking thickened bases ... ***A. agnipila****
  - Spines markedly unequal, the larger ones with thickened bases ... ***A. echinata****
- Leaflet teeth blunt or rounded; flowers and fruit in roughly spherical heads ... ***A. glabra***

Branches spreading laterally, flowers and fruit in roughly spherical heads
- Plant hairless; leaflets shining green above with red teeth; fruit compressed with 2 lateral wings, each enclosing a single unbarbed spine ... ***A. glabra***
- Plant hairy; leaflets various; fruit roughly cone-shaped, each with 4 spines, or no spines

  - Plant rhizomatous; heads of 2-20 fruits, unstalked or on short stalks less than 5cm long; spines not barbed if present (Section Microphyllae)
    - Leaves glaucous (distinctly bluish green) on upper surface
      - Leaflets with blunt or rounded teeth lacking hair tip; fruits c. 20 per head, on stalks to 5 cm long ... ***A. inermis***
      - Leaflet teeth sharply pointed with short hair tip; fruits c. 10 per head, in unstalked heads ... ***A. tesca***
    - Leaves green, olive, brown or purplish on upper surface

      - Leaves rich shining green on upper surface ... ***A. microphylla***
        - Fruits c. 20 per head, held above foliage ... var. ***microphylla***
        - Fruits 2-4 per head, hidden among the leaves ... var. ***pauciglochidiata***
      - Leaves dull green, olive, grey or purplish
        - Fruits c. 20 per head; heads on stalks to 5cm long ... ***A. inermis***
        - Fruits c. 10, capitula sessile or on short scapes <2cm long
          - Leaves olive, apple green or purplish, with distinct pattern of darker veins on upper surface; heads on stalks 0.6-1.5 cm long; fruit spines naked at tip ... ***A. rorida***
          - Leaves milky green or greyish, lacking pattern of darker veins; heads unstalked; fruit spines with soft hairs bent backwards at tip ... ***A. buchananii***
  - Plant stoloniferous; heads of >40 fruits, all bearing 4 barbed spines at maturity; heads on stalks >5cm long (Section Ancistrum, see next page)



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Plant stoloniferous; heads of >40 fruits, all bearing 4 barbed spines at maturity; heads on stalks >5cm long (Section Ancistrum)

Leaflet teeth hair-tipped

Prostrate stems 2-3.5 mm diameter; leaflets distinctly bluish green, folded lengthways, upper surface hairless; heads on red or yellowish stalks ... ***A. minor***

Stems <5 cm long; leaves <2cm long; fruits 40-50 per head ... var ***minor***

Stems 10-50 cm long; leaves >5cm long; fruits 100-130 per head ... var ***antarctica***

Prostrate stems ≤ 2 mm diameter; leaflets bluish green or otherwise, flat, upper surface almost hairless to very hairy

Leaflets distinctly bluish green on upper surface

Stipules entire to double-toothed; leaflets abundantly hairy on both sides, lower 1/3 untoothed; leaflet teeth serrate; heads on pale brown, hairy stalks; anthers white ... ***A. caesiiglauca***

Stipules deeply 3-5-toothed; leaflets ± hairless on upper surface and toothed to base; leaflet teeth rounded; heads on purplish, almost hairless stalks; anthers red ... ***A. fissistipula***

Leaflets green or ashy grey on upper surface, but not blue-green.

Prostrate stems 1.5-2 mm diameter, young stems sometimes reddish; upper leaf surface ± shining and hairless or sparsely hairy; florets 70-100, in heads 15-35 mm diameter (incl. spines) at maturity ... ***A. novae-zelandiae***

Prostrate stems < 1.5 mm, green or brown; upper surface ashy grey to dull green, sparsely to densely hairy; florets 40-60, in heads 10-15 mm diameter at maturity.

Leaflets pale green to ashy grey on upper surface, 5-11-toothed; leaflet teeth broad-based and deeply incised, some more than 1.5 mm long; heads on pale green or reddish stalks; anthers red ... ***A. profundiencisa***

Leaflets green on upper surface, 7-15 toothed; leaflet teeth not more than 1 mm long, small and narrow-based; scapes brown; anthers white

Stipules entire to two-toothed; upper leaflets usually rounded; leaflet pairs abruptly reduced in size below the 1-2 uppermost ... ***A. juvenca***

Stipules 3- to 8-toothed; distal leaflets usually oblong; leaflet pairs gradually reducing in size down the midrib ... ***A. anserinifolia***

Leaflet teeth without hair tips (see next page)

(from previous page)

Leaflet teeth without hairtips

Leaves (at least the younger ones) rich shining green on upper surface

Prostrate stems 1.5-2 mm diameter; leaves 30-60 mm long; terminal leaflet 9-12 mm long; leaflets smooth on upper surface ... ***A. novae-zelandiae***

Prostrate stems 2-3 mm diameter; leaves 45-100 mm long; terminal leaflet 12-20 mm long; leaflets slightly wrinkled on upper surface ... ***A. pallida***

Leaves dull green to slightly bluish green on upper surface

Prostrate stems ≤1 mm diameter; leaflets 7-11; leaflet pairs abruptly reducing in size below the 1-2 uppermost; heads on brown stalks 4-13 cm long; anthers white

Prostrate stems very slender, 0.7 mm in diameter; leaflets green, upper surface hairless; leaflet teeth 7-9, blunt ... ***A. emittens***

Prostrate stems 1 mm diameter; leaflets somewhat bluish green with upper surface sparsely hairy; leaflet teeth 11-15, sharply pointed... ***A. dumicola***

Prostrate stems ≥1 mm diameter; leaflets 11-17; leaflet pairs gradually reducing in size down the midrib; leaflet teeth 5-9; heads on red stalks 9-30 cm long; anthers red

Prostrate stems ≥2 mm diameter; leaflets green on upper surface with purplish secondary colouring, 9-14 toothed; head about 12 mm diameter when flowering, 10-30 mm diameter when mature ... ***A. magellanica***

Prostrate stems 1-1.7 mm diameter; leaflets bluish green on both surfaces, 5-8 toothed; head 6-9 mm diameter when flowering, <15 mm diameter when mature ... ***A. saccaticupula***

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Threatened plant Garden *Continued from page 9*

Special Southland plants included *Olearia hectori* and *O. fragrantissima*. Among the threatened grasses and sedges were *Deschampsia caespitosa, Carex tenuiculmis* and *Chionochloa spiralis*. Rare and threatened shrubland plants included *Pittosporum obcordatum, Melicytus flexuosus, Teucridium parvifolium* and *Helichrysum dimorphum*. Coastal plants seen were *Gunnera hamiltonii, Euphorbia glauca* and *Lepidium oleraceum* (Cook's scurvy grass).

Other plants seen, some from offshore islands, were *Myosotis capitata, Brachyglottis stewartiae, Pratia avencinia, Aciphylla dieffenbachii* (soft, not spiky), *Geranium traversii, Muehlenbeckia euphedroides, Carmichaelia astonii, Uncinia strictissima* (very rare), *Brachyglottis compacta* and *Pimelia crosby-smithii*, with flowers smelling like honey.

Highlight was a treat of sausage rolls from Chris and scones again from Jenny Gamble, plus a handful of seeds of *Aciphylla dieffenbachii* for each of us to try and germinate.

Otatara Reserve

The third site visited was Otatara Scenic Reserve. Otatara is based on an ancient sand-dune system up to 6,000 years old. The reserve is in an urban setting, and consists of a coastal totara and totara-matai dominated forest, in the middle of which is a wet area largely made up of manuka. It is managed by the Invercargill City Council and has a good standard track. Parts of the reserve are heavily infested with weeds, notably Chilean flame creeper, blackberry and sycamore.

Plants noted were *Podocarpus totara, P. hallii* and hybrids, *Dacrydium cupressinum, Prumnopitys taxifolia, Dicksonia fibrosa, Myriophyllum triphyllum, Coprosma lucida, C. foetidissima, Pittosporum tenuifolium, Pseudopanax arboreus, Pseudopanax colensoi* and clumps of *Astelia fragrantissima*. Everyone remarked on the very large size of the leaves on all the broadleaved forest trees.

Dr Carol West, conservancy advisory scientist, Invercargill, accompanied us for the day and was a great source of information. We appreciated her being there. Quote of the day "It's hard to tell the totaras apart, but we do know that they are totary different".

South Borland Burn Track (Jan 6)– *Saskia Wood*

The last afternoon excursion of the trip was kindly led by David Moss (Riverton, DoC, who reassured us by saying that he regularly took primary school children down these bluffs and he hadn't lost anyone yet!

At the top of the track from the Borland Saddle road we found a cluster of *Aporostylis* orchids flowering in a small, mossy hollow.

Soon we crossed the fault line from the Eldrig gneiss down into the forested limestone bluffs. This limestone is unusual as it consists of small rounded granite pebbles loosely cemented into the limestone, and is very crumbly.

Growing close to the limestone in this area of higher fertility was a stand of totara and also several southern rata (*Metrosideros umbellata*). The path descended through mossy mountain beech forest with attendant yellow-flowered mistletoe (*Alepis flavida*) then down along mossy silver beech river flats with the flowering, large-leaved red mistletoe (*Peraxilla colensoi),* high above in the 'possum cafes'. We noticed the meal remnants below on our path!

Ros did a great beetle impersonation in one of the slippery small streams we had to cross – she was rescued by Sir Tedword. Being the last day the Botanising had become a little sporadic, but lichening was avid to the last. Some of the party also noted mohua (yellow heads) calling in the tree-tops, and a unusually large number of slime-molds, both yellow and white, were noticed beside the lower track. Back at the Borland Nature Walk an arrow scratched in the ground alerted us to one last treat, the tall, sweetly scented flower of the unusual orchid, *Gastrodia*, that has no leaves or chlorophyll, but gains energy through a fungus that is parasitic on tree roots.

Look forward to the following reports next issue: Mt Burns and road to South Arm, Manapouri (30 Dec)– Beatrice Lee; Kepler Mire and Borland Bog (31 Dec) – Gael Donaghy; Blackmount/McKercher Creek(2 Jan) – Graeme Jane; Dean Burn and Big Totara (4 Jan)– Robyn Bridges; 'Pyramid' Lake (Jan 6)– Barbara Mitcalfe.

Photo: Jill botanising the aquatic flora of Pyramid Lake !

Summer Field Trip Participants:

Ted Abraham, Palmerston N. **Margaret Aitken**, Hutt Valley; **Tony Aldridge**, Christchurch; **Beth Andrews**, Eketahuna; **Sue Bennett**, Te Anau; **Barbara Bev**eridge, Wellington; **Peter Beveridge**, Wellington; **Robyn Bridges**, Dunedin; **Mary Bruce**, Dunedin; **Barbara Clark**, Porirua; **Gael Donaghy**, Tauranga; **Audrey Eagle**, Dunedin; **Pat Enright**, Ngaio; **David Glenny**, Christchurch; **Ian Goodwin**, Wellington; **Jill Goodwin**, Wellington; **Chris Horne**, Wellington; **Ros Iles**, Wellington; **Rick Jackson**, Christchurch; **Graeme Jane**, Tauranga; **Allison Knight**, Dunedin; **John Knight**, Dunedin; **Robin Knight**, USA; **Beatrice Lee**, Southland; **Rory Logan**, Dunedin; **Alan Mark**, Manapouri; **Keith Mayhill**, Tauranga; **Pauline Mayhill**, Tauranga; **Lyne McFarlane**, Invercargill; **Julie McLintock**, Nelson; **Barbara Mitcalfe**, Wellington; **Les Moran**, Nelson; **David Moss**, Riverton; **Moira Parker**, Dunedin; **Brian Rance**, Invercargill; **Chris Rance**, Invercargill; **Mary Robertson**, Palmerston N.; **Geoff Rogers**, Dunedin; **Emil Schmieg**, Eketahuna; **Tui Slade**, Invercargill; **Rosemarie Smith**, Gore; **Val Smith**, New Plymouth; **Nola Walker**, Dunedin; **Carol West**, Invercargill; **John Whitehead**, Te Anau; **Bastow Wilson**, Dunedin; **Joyce Wilson**, Wellington; **Saskia Wood**, Wellington.

BOOKS

Book review, by John Steel

Malcolm, W.M.; Malcolm, N. 2000. *Mosses and other bryophytes: an illustrated glossary.* 220 pp. H/back. Micro-optics Press, Nelson.
$80.00.

This book has been a little time coming. I seem to remember it being mooted a couple of years back and then early in 2000 I received the advanced flier but it was not until November that I finally had a copy in my hot little hands. This is an excellent book with about 1500 entries supported by nearly 1000 colour photographs which, as well as serving particular references, also illustrate nearly 400 different species - all from New Zealand.

Technical terms can pose daunting problems to amateurs and professionals alike and this is especially so in less popular subjects like bryology. Even when explained in a glossary, one may still have difficulties interpreting a particular entry. Bill and Nancy's book, however, has overcome this, providing them with a vehicle for their superb micro-photography. The glossary is comprehensive. One excellent touch that appealed to me was that where an entry included reference to another term, this was not only given but briefly defined so I didn't have to go hunting it out elsewhere. I suppose it is natural for my deviant senses to try to find omissions but, try as I might, I could only come up with a few irrelevant (and doubtful) terms which were usually of a more general nature. I might have liked to see moss, liverwort and hornwort defined but accept that this could be outside the scope of the book.

The $80 price tag may seem high but in my opinion this as good value as one can find. It is available from Manaaki Whenua Press, Box 40, Lincoln, who give a 20% discount to members of Botanical Societies (see next page). Or it may be ordered through the University Bookshop, Great King Street, Dunedin

Discounts from Manaaki Whenua Press – Don't forget that Mannaaki Whenua Press is still offering members of Botanical Societies a generous 20% discount off all their publications except for their already bargain offer of all 5 volumes of the NZ Flora for $100. As well as the bryophyte book reviewed above, they have stocks of the excellent field book "Lichens of rainforest in Tasmania" which we reviewed last year, list price $44.95, and of Bill and Nancy Malcolm's latest "New Zealand Lichens", list price $42.50 which we will review next issue. So do remember to mention that you are a BSO member when you order.

Arnolds Books, 11 New Regent St, Christchurch, are buyers and sellers of 'Antiquarian Natural History Books'. They put out a mouth-watering list of Botanical books for sale. Check them out on http://www.bydesign.net.nz/arnold books, or email: arnold@netaccess.co.nz

BOTANICAL NOTES

***Coprsoma pedicillata* synonyms**
By Allison Knight

This small-leaved *Coprosma* has been formally described relatively recently. For those who found the taxonomic history of the new name as tortuous as I did, here are a few snippets to ponder.

In the NZ Bot. Soc. Newsletter, p13, Dec 2000, Ewen Cameron reports: "*Coprosma pedicillata* (Rubiaceae), a new species from New Zealand" by BPJ Molloy, PJ de Lange & BD Clarkson, **NZ J Bot. 37: 383 –397 (1999)**. An erect shrub or small tree similar to *C. parviflora* var *dumosa* sensu Cheeseman *(= C. "taylorae"),* but with violet drupes, from eastern NZ (Gisborne to Southland).

It helps to know *C. pedicillata* has violet fruit. This distinguishes it from the rather similar *C. parviflora* var *dumosa* sensu Cheeseman *(= C. "taylorae"),* which has white fruit, sometimes with a touch of pink according to Ewen (and occasionally yellow fruit and very occasionally dark purple fruit, according to Adrienne Markey).

Perhaps more usefully for the field botanist, who is familiar with the Druce tag names, Shannel Courtney, in his 10th revision of "A checklist of indigenous vascular plants of NZ", has this entry beside *Coprosma pedicillata: = "Coprosma violacea" = Coprosma* sp (v) of A Eagle, = *Coprosma* aff. *parviflora* of H Wilson.

Which just goes to show how confusing it can become if botanists keep on referring to new species using "tag" names, without publishing formal descriptions.

Notes from the Otago Herbarium

By Janice Lord

OTA is thriving! Jennifer Bannister and Allison Knight are keeping busy curating the lichen collections, and Ann Wylie has joined the "Friends of OTA" team, working on the bryophyte collections. John Steel is looking after the ferns. I have been whittling away the pile of vascular specimens to be filed, and also gradually adding angiosperm specimens to the Lotus Approach database. We have purchased a mapping program, "VisualMap" by Simon Morris, which converts lat-longs or map references into a dot map. Unfortunately the program is not compatible with the operating system on the Herbarium Computer, but will be on the Botany Department Server shortly.

In the period 1st Dec 1999 to 30th November 2000, OTA accessioned 3012 specimens: 258 Angiosperms, 14 Pteridophytes, 1906 bryophytes, 36 algae, and 773 lichens. This brings the total collection size to approximately 30,000 vascular specimens and more than 20,000 nonvascular specimens. We loaned 134 specimens to other institutions, and

received 691 specimens in loans. The seed collection is also being added to regularly. This is mainly a collection of seeds of native and introduced fleshy fruited species in the Dunedin area, and is proving very useful for identifying seeds from animal gut contents and faeces.

As you all no doubt know, BSO members are most welcome to add specimens to the Herbarium or seeds to the seed collection. With regard to the vascular collection, I am particularly interested in building up the weed collection in the Herbarium – we have relatively few accessions of important weed species; a good representation now can help in tracking the spread of weeds in the future. Just a reminder to those that do use the Herbarium – please put boxes back in the correct order, and please put species folders back inside the larger genus folders within each box – this protects the specimens from damage and makes them easier to extract from the box.
happy collecting!

First genetic sequence of a plant mapped

Arabidopsis thaliana (thale cress) this year joins the fruit fly, yeast, the nematode worm and two dozen bacteria as organisms that have revealed their entire DNA blueprints.

NEWS

More Honours for Alan Mark

The biggest and most welcome news on the WBS/BSO summer field trip was the awarding of the DCNZM (Distinguished Companion of the New Zealand order of Merit) to one of our most distinguished members, emeritus Professor Alan Mark.

Fittingly, Alan had spent the last 2 days before New Year vigorously leading the first 2 days of our field trip. - up to the alpine vegetation in the snow of Mt Burns and out to the South Arm of his beloved Lake Manapouri the first day, then into the depths of the Kepler Mire the second.

Emeritus Professor AF Mark, DCNZM
(photo courtesy of Otago Daily Times)

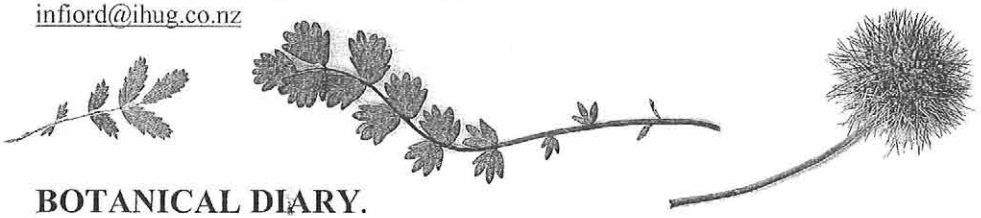
Prof Mark saw the award as a really important recognition of conservation. He was quick to acknowledge the contribution of others, as 'conservation, by its nature, is a team effort'. Asked where he thought our members could best direct their conservation

efforts in the future, he said that the next big challenge for New Zealand, and for Otago especially, was to push for the creation of a National Park, based on high country tussock grasslands. Central Otago high country, including the Old Man Range, would be Alan's first choice. The case for this is put in his 1990 paper, which is available from the BSO library in the Botany Dept tea room.

Mark, AF (1990). Ecological and Nature Conservation Values: The Case for a Conservation Park. In Fitzharris B and Kearsly G, eds *Southern Landscapes*. Department of Geography, University of Otago.

BSO Membership of Borland Trust

BSO is now a group member of Borland Lodge Adventure and Education Trust for 2001. This well-equipped and friendly outdoor education camp on the doorstep to Fiordland proved an excellent venue for our summer field trip, with a wide variety of botanical habitats close at hand. Accommodation at the Lodge will continue to be available at a discount this year for BSO members. Enquires and bookings to the resident managers, Gary and Lyn Tong, phone/fax: 03 225-5465, email: infiord@ihug.co.nz



BOTANICAL DIARY.

Notes on Awakiki and Otanomomo for March 24 field trip, by Kelvin Lloyd

Awakiki Bush Scenic Reserve, located on dry fertile soils among rolling hills south of Balclutha, holds the most important remnant of totara-dominated forest in Otago. It is a major southern locality for several species, and the presence of large-diameter totara trees suggest it escaped both european and polynesian fires. There are too many interesting plant species to list here! Reserved and fenced relatively recently, the understorey is regenerating strongly, but many weed species are also present. Of great concern is the recent invasion of *Tropaeolum speciosum* (Chilean Flame Creeper), which is dominant at nearby Otanomomo. We will visit both forests. Wear rugged clothing if you intend to venture off the easy loop track at Awakiki - it can be very scratchy forest. There is no track at Otanomomo. **Oh, and don't forget to bring your *Acaena* key to test!**

National Fungal Foray 2001. This year the 15th New Zealand Fungal Foray will be held at Lake Whakamarino, near Urewera National Park, from 8-12 May. Four full days of collecting, discussing and identifying fungi. For more information see the PDF file on our BSO web page: http://www.botany.otago.ac.nz/bso, or email David Orlovich: david.orlovich@botany.otago.ac.nz

May – June : Wildflowers of Deosai Wilderness Park
(With New Zealand rare plants Botanist Cathy Jones)

Cathy has sent us a flier about a tempting 22 day trip she is leading to Northern Pakistan (Himalayas and Karakoram Ranges), looking at wildflowers in four places and passing through some stunning countryside. Cost US$1800 plus travel to and from New Zealand.

For further details phone Cathy at 03 546 9499 or contact Murray and Pat Reedy, Silk Road Adventures, 415 Main South Road, Greymouth, phone 0800 349 739

More Dates for your Diary, BSO events in boxes

14 Feb, Wed 7 pm Botanical Society of Otago AGM. Guest speaker Prof W Bond **"Divaricating plants – defence against toothless browsers?"** Zoology Dept Annexe,

17 Feb, Sat. 9 am. Full day BSO field trip to saltmarsh near Brighton and forest near Taieri Mouth. Leader – Helen Clarke.

28 Feb, 12 noon, Botany Dept Seminar, : Prof. Steven Stephenson, Fairmont State College, West Virginia
"Distribution and ecology of myxomycetes in terrestrial ecosystems"

7 March, 12 noon. Botany Dept Seminar. Simon Johnson, Botany Dept & School of Environmental Sciences
"*Prumnopitys ferruginea* (miro) seedling dispersal patterns in the Catlins"

14 March, 12 noon. Botany Dept Seminar. Jennifer Bannister, Botany Dept Herbarium:
"The distribution of *Ramalina* species in New Zealand"

21 March, 12 noon. Botany Dept Seminar. Claudia Keitel, Botany Dept
"Isotope signatures as indicators of the water supply of trees along an environmental gradient" and Steve Rate, Botany Dept. PhD proposal:
"Invertebrates in snow tussock (*Chionochloa macra*)"

21 March, Wed.7**pm**. **"Highlights of the Summer Field Trip in Fiordland"**. Slides by Audrey Eagle and Rory Logan, photo displays by Robyn Bridges, Moira Parker and any one else who wishes to bring them!. Supper. Zoology Annexe Seminar Room

25 March, Sun. Kelvin Lloyd will lead a full day field trip to totara-dominated forest in **Awakiki Bush Scenic Reserve** and to nearby **Otanomomo**, south of Balclutha. Meet 9am, Botany Dept car park, 464 Gt King St to car pool. **Bring your *Acaena* key**! More details previous page. Car pool costs for 2001: 7c/km/passenger, to be paid to driver

28 March, 12 noon. Botany Dept Seminar. José Derraik, Botany Dept
"Invertebrate Studies in a Native Shrubland"

4 April, 12 noon. Botany Dept Seminar. Andrew Scott, Botany Dept.
"The Dunedin Townbelt: the ecology of an urban forest fragment"

11 April, 12 noon. Botany Dept Seminar. Sarah Painter, Botany Dept
"Effect of Light Quality on Organogenesis in Petunia and pine"

29 April Sunday afternoon. **Varleys Hill**, Otago Peninsula, between Hoopers and Papanui inlets. A QE II covenant belonging to John and Moira Parker. **Meet 1 pm** at Botany Dept car park, 464 Gt King St, to car pool, or 1.30 pm at Hoopers Inlet Hall.

Botany Dept Seminars are upstairs in the Botany School Annexe (the big red-brown building), Cnr Union St West & Great King St.

Botanical Society of Otago: whom to contact

Submissions for the diary and new members, subscriptions or donations to:
Trish Fleming
c/o Botany Dept., University of Otago, P. O. Box. 56, Dunedin
Phone (03) 479 7579
email trish@planta.otago.ac.nz

Submissions for the newsletter email Allison Knight: curator@botany.otago.ac.nz

Ideas for activities to:
Bastow Wilson,
c/o Botany Dept., University of Otago, P. O. Box. 56, Dunedin
e-mail bastow@otago.ac.nz
Phone (03) 479 7572 work, 473 9300 home.

For information on activities:
the trip leader
or Trish (contact above),
or Bastow,
or see our webpage: http://www.botany.otago.ac.nz/bso

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