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New Zealand Botanical Society

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Deadline for next issue

The deadline for the June 1997 issue (Number 48) is 26 May 1997.

Please forward contributions to:

Bruce & Beverley Clarkson, Editors
NZ Botanical Society Newsletter
7 Lynwood Place
HAMILTON

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

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

Fruiting bodies of *Amanita muscaria*, an ectomycorrhizal mushroom introduced to New Zealand early this century, known to be invading native plant communities at some sites. See article by Johnston and Buchanan p. 8. Illustration by **Marie Taylor**, St Heliers, Auckland.

New Zealand Botanical Society News

■ **Balance sheet for the financial year 01 January - 31 December 1996**

INCOME		EXPENDITURE	
B/fwd from 1995	3209.30	Printing *Newsletter 42*	1276.88
1996 Subscriptions	3392.00	Postage *Newsletter 42*	184.00
1996 Student Subscriptions	52.00	Printing *Newsletter 43*	900.00
Donations	303.00	Postage *Newsletter 43*	185.60
Back Issue Sales	100.00	Printing *Newsletter 44*	1276.88
Subs in advance	14.00	Postage *Newsletter 44*	184.00
Interest chq a/c	0.15	Printing *Newsletter 45*	928.13
Interest investment a/c	146.44	Postage *Newsletter 45*	182.40
		Printing *Newsletter 46*	1237.50
		Postage *Newsletter 46*	182.40
		ECO Subscription	100.00
		Bank fees	5.88
	7216.89		6643.67

Excess income over expenditure of $573.22 (represented by chq a/c balance of $12.68 and investment a/c balance of $560.54) carried forward to 1997.

Anthony Wright, Treasurer, New Zealand Botanical Society 19 February 1997

Regional Botanical Society News

■ **Auckland Botanical Society**

January Camp

Fourteen members, with trustee Val Hollard as guide, enjoyed the comforts of the house on the Native Forest Restoration Trust's Rangitoto Station at Otorohanga. With Val's expert guidance, the party was thrilled to observe two near-fledgling kokako chicks being fed by both parents. The 14 chicks hatched on the station this year bear witness to the success of the continuing pest eradication programme. Some botanical highlights for Aucklanders were plants which are seldom, or never, seen in the north: *Luzuriaga parviflora, Libertia pulchella*, and *Dracophyllum traversii*, all in flower, and the ferns *Ophioglossum coriaceum, Botrychium australe, Blechnum colensoi*, and *B. penna-marina*.

February Field Trip

Botany of the fossilised kind was the focus of the morning. Under the leadership of geologist Bruce Hayward the remains of two fossil forest were explored. The first forest, which grew in black peat, is represented by huge kauri stumps and logs on the foreshore at Ihumatao, near Auckland airport. The second forest was overwhelmed by volcanic ash showers from nearby Maungataketake (Elletts Mountain), and the remains are seen in the cliff. Fascinating as the geology is, the living botany could not be ignored, as the plants growing among the pohutukawa on the crumbling cliffs are all that remain of the natural cover in this highly modified area. *Blechnum* "Green Bay" and *Cortaderia fulvida* were probably the most significant plants to be seen.

The afternoon included a stop to view Pukaki Crater, Mangere, which used to be filled with mangroves but on this day sported a nice herd of polled Angus cows. A scramble through the sedges and rushes growing in Kohuora Crater completed the day. The regionally scarce *Carex subdola* grows on private land there, but part of the crater is now a reserve.

Forthcoming activities

Wednesday 7 May - "Animal pest management on offshore islands"; Ian McFadden.

Saturday 17 May - Vining Scenic Reserve, Hunua Ranges; leader Jack Mackinder.

Maureen Young, 36 Alnwick Street, Warkworth

■ Nelson Botanical Society

December field trip report - Beebys Knob

A terrific turnout of over 30 and sufficient 4-wheel drive vehicles to get everyone to the top. After a brief snow shower brilliant sun arrived allowing 2 hour's fossicking close by. The area near the hut has a low shrubland of bog pine, snow totara, mountain toatoa and hebes. Wet plants of *Hebe venustula* and *H. canterburiensis* caused some confusion, with only the latter in flower but were distinguished by their leaf sinuses. The shrubby *Coprosma* species and many of the herbs coming into flower provided plenty of interest. Back along the road a variety of shrublands alternated with areas of carpet grass, with patches of *Euphrasia zelandica* and *Celmisia sessiliflora* in flower and buds of gentians soon to flower.

January field trip report - Mt Arthur

A day for mixed weather promises and realisations. Thirty of us arrived at the Flora car park in brilliant sunshine and headed out for the Mt Arthur Hut. An advance party had already left two hours earlier. The walk up through the forest is always beautiful with its varied beech forest, tall grass trees (*Dracophyllum traversii*), and stand of cedar where the essential search for *Hymenophyllum malingii* is made. As the hut is reached the forest becomes invaded by alpine shrub species and a range of calcicole species appears on the marble substrate. These include *Brachyglottis greyi, Hebe albicans* and the magnificent *Celmisia dallii.*

From the hut it is but a short distance into the tussock grasslands. By now the *Ranunculus insignis* is finished at this altitude but the array of celmisias is now in full flower, including my favourite *C. traversii* with its deep green colour and red hair-fringed margins. The tall *Aciphylla* aff. *glaucescens* is also in flower and the small narrow-leaved *Gentiana filipes* is just budding. Many of the species appear to flower late this year. At the main area of sinkholes we are rewarded with walls covered with *Ranunculus insignis* in full flower along with *Celmisia traversii, C. dallii, Dolichoglottis lyallii, Epilobium vernicosum* and many other small herbs. As always the display is well worth the walk. Around the area are the local endemics *Hebe ochracea* and the heavily perfumed *Oreoporanthera alpina.* Special thanks to the out of town guests Anne and Basil Graham and friends who added interest to the trip with their queries and the welcome expertise of John Smith-Dodsworth who usually had the answers even for the local botanists.

Anniversary weekend camp report: 31 January - 3 February - Waimangaroa

Saturday was a long hard slog up on to the Glasgow Range. The lower forest was typical moss- and fern-rich mixed beech, rata, kamahi and quintinia forest. Tree trunks and logs were often covered in dense carpets of kidney fern and feast of filmy ferns such as *Hymenophyllum rufescens* and *H. lyallii* which are rarely seen around Nelson. Other epiphytes included orchids such as especially abundant *Dendrobium cunninghamii* and *Earina autumnalis*. Further up the ridge alpine species began to appear including *Archeria traversii* and *Pseudopanax linearis*. Finally we emerged out into the dense shrublands created by a fire some 20 years ago. In the dried out areas first we saw the pale blue flowers of *Herpolirion novae-zelandiae*, then we spotted patches of *Lyperanthus antarcticus* and then a large patch of a large blue flowered orchid which after much thumbing through the orchid book turned out to be *Thelymitra cyanea*. Finally we emerged out on to red tussock grassland with *Celmisia armstrongii, C. dallii, C. monroi* var. *lancifolia* and *C. incana* and a spectacular orange-margined, glaucous *Aciphylla*. Leaves varied from quite fine and long to very stout yet soft. Further up slope on the steeper slopes we encountered *Aciphylla hectori* and something identifiable as *A. anomala*. When all the material was set out on a table in the evening hybrids were identifiable between all three parents but especially between *A. indurata* and *A. anomala*.

On Sunday we headed across the Stockton Plateau towards Ngakawau Gorge along an old power station investigation road. There were many sedges and rushes and other wetland plants. The first spectacular find was large patches of *Euphrasia disperma* with the tremendously long corolla tubes. Next there were more blue orchids. *Thelymitra cyanea* at first and then *T. pauciflora* and an apricot *T. cyanea*. On the rocky areas *Dracophyllum pronum* was common. The next find was *Pimelea gnidia*, unfortunately it had finished flowering. Other intriguing plants were depauperate *Sticherus cunninghamii* and bog pines, including silver pine (*Monoao colensoi*), yellow silver pine (*Lepidothamnus intermedius*), and pink pine.

The last morning we ventured to the Waimangaroa beach and a walk down to a large coastal stand dominated by rimu, kamahi and quintinia. Other interesting plants were large horopito (*Pseudowintera*

axillaris), huge rata, kahikatea, hinau, miro and shrubs such as *Coprosma tenuicaulis*. Epiphytes included *Pittosporum cornifolium* and abundant *Dendrobium cunninghamii* (some in full flower), *Collospermum hastatum* and many ferns. Filmy ferns included *Hymenophyllum ferrugineum, H. lyallii* and *H. rufescens*. The special find of the morning was *Bulbophyllum pygmaeum*, abundant in a wet area on silver pine.

February field trip report - Mt Robert

About 20 members turned out to a brilliantly clear day. The walk up the zig-zag was mainly through induced grassland (the result of past burning-off) and a few scattered beech forest remnants which are all that remain of the original forest cover. The points of difference between *Raoulia subsericea* and *R. glabra* stimulated some discussion over the tighter mat and white hair tipped leaves in the former compared with the looser mat and yellow-green leaves in the latter. In the higher patches of forest a large patches of snow totara (*Podocarpus nivalis)* made a fine ground cover and here *Gaultheria depressa* s. lat., *G crassa, G. antipoda* and *G. macrostigma* provided an interesting array of hybrids.

After lunch, just above tree-line, the track led on along the ridge through a greater variety of plants. Many of the early flowering species had finished but there were still plants of *Celmisia sessiliflora* in flower and *Hebe coarctata* was flowering very well. Flowering *Gentiana montana* were also quite numerous along with *Euphrasia revoluta*, and at one point, the diminutive *E. zelandica* was discovered. Initially the rocky outcrops contained *Raoulia bryoides* but further along the ridge, overlooking the ski basin, *R. rubra* became plentiful along with *Hebe tumida* and *Chionohebe pulvinaris*. *Notothlaspi australe* was quite plentiful on the scree, and the flattened rosettes of its seed pods gave the plants an unusual appearance and contrasted with the taller *N. rosulatum* which was less common. On the stable scree slopes numerous plants of *Lignocarpa diversifolia* were of great interest. Lack of time prevented a descent into to the ski basin so we headed back to the car park.

Forthcoming trips

March 16	Mt Starveall
April 20	Maitai Caves
May 18	Wangapeka
Easter	Marlborough (Awatere)
Anzac 25-27 April (Friday)	Patarau

Graeme Jane, 136 Cleveland Terrace, Nelson

■ Wellington Botanical Society

Programme: May 1997 - January 1998

Saturday 3rd May: Field Trip: Te Marua Workbee - Please bring any of these: loppers, secataurs, mattocks, pruning saws, garden gloves. Leader: Ian Atkinson 527-8234 (h) 528-6089 (w). Deputy Leader: Barbara Mitcalfe 475-7149.

Monday 19th May: 7.30 pm -Evening meeting: Members Evening - Bring your favorite slides for a "show and tell" evening.

Saturday 7th June: Field Trip: Coastal Crawl - A trip up around the coastline looking at the rare and endanged plants found there in close proximity to the city. Leader: John Sawyer 384-1485 (h) 472-5821 (w). Deputy Leader: Pat Enright 479-1208 (h) 495-0966 (w).

Monday 16 June: 7.30 pm - Evening meeting: South America - Speaker: Kath Dickinson.

Saturday 5th July: Field Trip: Haywards Bush Reserve - To look for early-flowering orchids and see some large remnant podocarps. Leader: Margaret Aitken 566-2731(h) 801-8838 ext. 4665(w). Deputy Leader: Olaf John 479-7605.

Monday 21st July: 7.30 pm - Evening meeting: What Landcare Research is doing in Plant Biosystematics - Speaker: Ilse Breitweiser.

Saturday 2nd August: Field Trip: Eastern Hutt - To look at a bush area that has been closed to the public for decades. Leader: Barbara Mitcalfe 475-7149. Deputy Leader: Chris Horne 475-7025.

Monday 18th August: 7.30 pm - Evening meeting: Home nurseries - Speakers: Vaughn Bell and Gary James.

Saturday 6th September: Field Trip: Manawa Karioi workbee - Leader: Maggie Wassilieff 383-6100 (h).

Monday 15th September: 7.30 pm - Evening meeting: Wellington's Wild West - Speakers: Barbara Mitcalfe and Chris Horne.

Saturday 4th/Sunday 5th October Field Trip (overnight): Aorangi Forest Park - Leader: Chris Horne 475-7025. Deputy Leader: Barbara Mitcalfe 475-7149.

Monday 20th October: 7.30 pm - Evening meeting: The Story of Cuvier Island - Speaker: Ian Atkinson.

Saturday 1st November: Field Trip: Pipinui Pt and surrounds - To look at *Pimelea aridula* and search for other rare and endangered plants. Leader: Pat Enright 479-1208 (h) 495-0966 (w). Deputy Leader: Olaf John 479-7605.
Monday 17th November: 7.30 pm - Evening meeting: Seaweeds - Speaker: Wendy Nelson.
Saturday 6th December: Field trip (overnight): Mount Percy - Leader: John Sawyer 384-1485 (h) 472-5821 (w). Deputy Leader: Tony Silbery (06) 375-8004(h) (06) 3758288 (w).
New Year's trip - Sunday 27th Dec 1997 - Tuesday 6th Jan 1998 - Possibly Pirongia area in the King Country. More infomation later.

Pat Enright, Secretary, PO Box 10-412, Wellington

NOTES AND REPORTS

Fungi Records

■ **The naturalised mushrooms of New Zealand, 3:** *Suillus grevillei* (Klotzsch) Singer, in *Farlowia*, 2: 259 (1945).

Etymology: Named in honour of R.K. Greville (1794-1866), an Edinburgh botanist. Trivial name "the larch bolete" (Taylor 1970; Phillips 1981).

Pileus 25-80 mm, convex to planar convex, margin entire, sometimes appendiculate with small fragments of annulus, pileipellis slimy and glossy, margin entire, at first cinnamon ochreous, then luteous to pure yellow near margin, becoming blotched with ochreous markings, margin discolouring to sepia; flesh very pale luteous, with a slight cinnamon flush beneath pileipellis, grey line above tubes, not blueing when cut. Tubes to 8 mm long, adnate, straw, pale luteous to amber or honey, greying when cut or bruised. Stipe 50-55 mm high, 6-15 mm diam. at apex, 13-19 mm diam. at base, clavate, may narrow rapidly at apex, solid, annulate; annulus sub-cortinoid to felted membraneous, membrane between pileus margn and stipe luteous, followed by a narrow band of apricot, then on stipe pale luteous, inner surface pale luteous, in mature basidiome whole annulus pale luteous, sometimes fugacious; above annulus fibrillose, reticulate, luteous; below annulus fibrillose, occasionally finely reticulate, then velvety to fibrillose, at first luteous with sienna markings, later especially towards base becoming grey olivaceous; flesh at first luteous, then developing olivaceous grey tones in lower stipe, young stipe bruising cinnamon when cut, in older stipes some blueing in upper stipe when cut. Spore print dark hazel to isabelline.

Spores (7.5-)9.1-9.8(-10.6) x 3.0(-3.7) m, fusiform-elliptical to subfusiform, pale hazel, smooth. Basidia 19.6-27.2 x 6.0-7.5 m, clavate, 4-spored, without clamp connections. Pleurocystidia 33.2-52.8 m, cylindrical to clavate, hyaline to pale luteous, occasionally sienna, rarely some resinous incrustations, usually grouped in clusters. Pileipellis divided into three layers; upper layer an irregular ixocutis, hyphae 3-6 m diam., pale luteous; middle layer of more densely packed hyphae tending towards a vertical alignment, hyaline to very pale luteous; lower layer cellular, hyaline. Clamp connections absent in all tissues.

Specimen examined: Under *Sequoia sempervirens* and *Larix decidua*, Bay of Plenty, Rotorua, Longmile Rd, Redwood Grove, 38°09' S 176°17' E, 19.i.1997, *L.R.C. Ridley*, NZFRI(M) 3680.

This fungus (Fig. 1) was observed fruiting in great profusion in the Redwood Grove and around the FRI campus following the cyclonic weather conditions of late December 1996 and early January 1997. I was initially uncertain of its identity because of the apparent association with coastal or Californian redwood, *Sequoia sempervirens*. However further investigation showed that *Larix decidua*, the usual mycorrhizal host, was present but suppressed or eliminated by the taller redwoods. It is not known if *Suillus grevillei* is mycorrhizal with the redwoods, or whether there are living larch roots present. In its native holartic range it has been recorded in association with species of *Larix*. In New Zealand *S. grevillei* is usually found in association with the European larch (*L. decidua*) but it has also been recorded under the western American larch (*L. occidentalis*) and the Japanese larch (*L. kaempferi* = *L. leptolepis*) (McNabb 1968).

It was McNabb (1968) who first used the binomial *Suillus grevillei* (Koltzsch) Singer for the New Zealand population of this introduced mushroom. Prior to this the first reference in New Zealand to this bolete was

as *Boletus elegans* Schum.: Fr. in a list of mycorrhizal fungi (Rawlings 1951). The first description was published by Stevenson (1961) as *Suillus elegans* (Schum.: Fr.) Snell but without illustrations or any indication of a voucher specimen. Taylor (1970) published a watercolour illustration as *Suillus elegans* (*Boletus elegans*).

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McNabb, R.F.R. 1968. The Boletaceae of New Zealand. *New Zealand Journal of Botany 6:* 137-176.
Phillips, R. 1981: Mushrooms and other Fungi of Great Britain and Europe. London, Pan.
Rawlings, G.B. 1951. The mycorrhizas of trees in New Zealand. *Forest Research Notes 3(1):* 15-17. Wellington, Forest Research Institute and New Zealand Forest Service.
Stevenson, G. 1961. The Agaricales of New Zealand: I. Boletaceae and Strobilomycetaceae. *Kew Bulletin 15:* 381-385.
Taylor, M. 1970. Mushrooms and Toadstools in New Zealand. Wellington, A.H. & A.W. Reed.

Geoff S. Ridley, NZ Forest Research Institute, Private Bag 3020, Rotorua

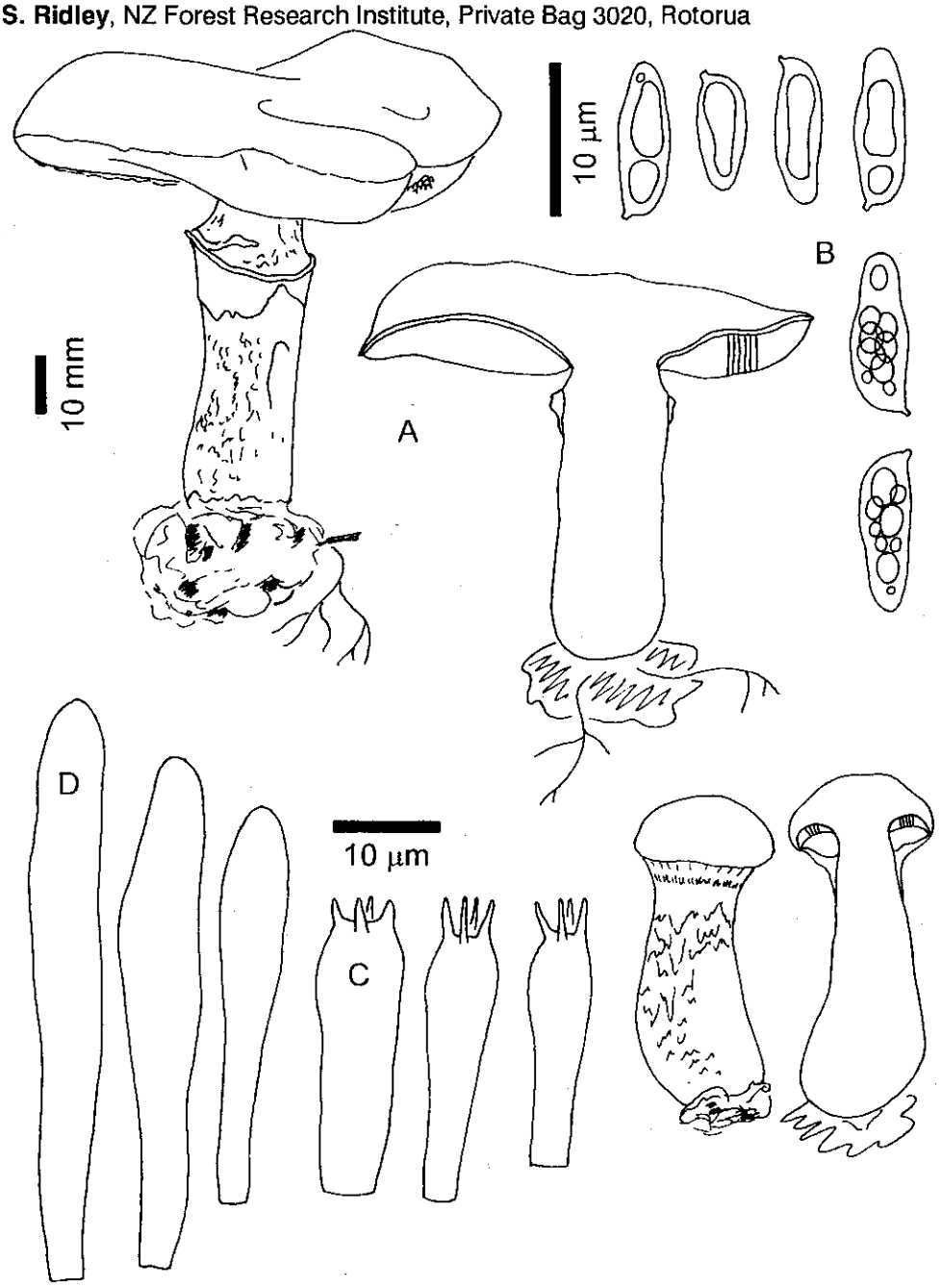

Figure 1: *Suillus grevillei*. **A, habit and section of fruit body; B, spores; C, basidia; D, pleurocystidia.**

Plant Records

■ Observations on *Mirabilis jalapa* (Marvel of Peru)

I have been studying *Mirabilis jalapa* (Marvel of Peru) in the family Nyctaginaceae originally from Tropical America and record here my observations.

Flowers open late afternoon. Remain open all night, and closing next morning. The flowers are mostly hermaphrodite, but some male flowers. Ovary round. Stamens 5. Style long, sometimes exserted. Filaments long and slender. Filaments and style sometimes turn red as the flower ages.

As these flowers are open at night, and are long and tubular, they may be moth pollinated, but are probably sometimes self pollinated, because although they are protogynous, the stigmas appear to remain receptive until the anthers dehisce, at which time the stigmas are sometimes covered by the flower's own pollen.

In the early evening, when it is still daylight and the flowers open, I have observed a small bumble bee (species unidentified) visiting these flowers. The bee does not attempt to enter the flower but instead bites through the lower perianth (close to the ovary) to rob nectar. On inspecting the flowers afterwards, the damage done to the perianth can be clearly seen. The flowers do get fertilized somehow, as they set seed, and reproduce in quite large numbers.

If anyone has any more information on the flowers of this plant, would they please contact me. My address is given below.

Eric Turfrey, 9 Bennett Street, Wanganui

Comment

■ Future-proofing

In a recent timely article, Dixon and Outred (1996) point out that voucher specimens in herbaria precisely define the plant studied as a protection against misidentification. I would like to add a further good reason for making and citing voucher specimens: they future-proof the research against taxonomic changes, which will be all too common until the classification and description of our Flora is completed. For example, *Ranunculus hirtus* sensu Allan (1961) has been divided into four species, none of which is called *R. hirtus* (i.e., *R. altus, R. membranifolius, R. mirus, R. reflexus,* Webb *et al.*, 1988). Pre-1988 authors who cited vouchers for their *R. hirtus* material have future-proofed their work because the identity of the plant studied can be verified; the others have left a name in the literature whose meaning can no longer be understood.

Colin Webb and I argued recently that citation of vouchers should be a requirement for publication of original research (Garnock-Jones & Webb, 1996).

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Dixon, L & Outred, H. 1996: Do you deposit voucher specimens in an herbarium? If not, why not? New Zealand Botanical Society Newsletter 46: 19–20.
Garnock-Jones, P.J. & Webb, C.J. 1996: The requirement to cite authors of plant names in botanical journals. *Taxon 45*: 285–286.
Webb, C.J.; Sykes, W.R.; Garnock-Jones, P.J. 1988: Flora of New Zealand Vol. 4. Botany Division, DSIR, Christchurch.

P.J. Garnock-Jones, School of Biological Sciences, Victoria University of Wellington, PO Box 600, Wellington

■ Nomenclatural correctness

Two practices not in accord with the International Code of Botanical Nomenclature (Greuter *et al.* 1994) are unfortunately becoming more common in print in New Zealand. I raise them here for the general information of botanists.

1. Infraspecific taxa and trinomials. The ICBN forbids the use of trinomials without an indication of rank (Art. 24.1), although the Zoological Code allows them (e.g., *Anas aucklandica nesiotis*). The reason is simple: the Zoological Code admits only one infraspecific category, the subspecies, whereas the ICBN allows subspecies, varietas, and forma. In botany then, it is mandatory to identify which rank is meant: e.g., *Hordeum murinum* subsp. *murinum*, *Dracophyllum longifolium* var. *cockayneanum*, *Hebe amplexicaulis* f. *hirta*, **not** *Hordeum murinum murinum*, *Dracophyllum longifolium cockayneanum*, *Hebe amplexicaulis hirta*.

2. Synonyms and subgenera. When presenting alternative or superseded names in papers and articles, some authors insert the alternative generic name in parentheses between the accepted generic name and the species epithet, e.g., *Kunzea* (*Leptospermum*) *ericiodes*. This form is however recommended by the ICBN (Rec. 21A) for indicating the infrageneric name, e.g., *Hebe* (*Glaucae*) *pimeleoides*, *Raoulia* (*Psychrophyton*) *eximia*. I suggest writing the full alternative name in parentheses after the accepted name, e.g., *Androstoma empetrifolia* (*Cyathodes empetrifolia*). When stating the infrageneric name, I would also recommend including a statement of rank (subg., sect., or ser.) for the same reasons as in (1) above, e.g., *Hebe* (sect. *Glaucae*) *pimeleoides*.

Reference

Greuter, W., Barrie, F.R., Burdet, H.M., Chaloner, W.G., Demoulin, V., Hawksworth, D.L., Jørgensen, P.M., Nicolson, D.H., Silva, P.C., Trehane, P. & McNeill, J. 1994. International code of botanical nomenclature (Tokyo Code) adopted by the fifteenth International Botanical Congress, Yokohama, August–September 1993. *Regnum Veg.* 131.

P.J. Garnock-Jones, School of Biological Sciences, Victoria University of Wellington, PO Box 600, Wellington

Research Reports

■ Invasive exotic fungi in New Zealand's indigenous forests - you can help!

Invasion of natural ecosystems by introduced organisms poses major threats to ecosystem composition and functioning, and is of particular importance in a long-isolated island biota such as ours. Although invasions by introduced animals and plants are well documented, internationally the impacts of introduced fungal species, other than plant pathogens (von Broembsen 1989), have been largely ignored (Drake *et al.* 1989).

While many of the fungi found in New Zealand are introduced pathogens of economically important plants, very few of these have invaded native plant communities. A possible exception is the root-rot pathogen *Phytophthora cinnamomi*, known to cause disease in native forests, and possibly introduced to this country by humans (Newhook & Podger 1972, Beever 1984). Past studies have speculated on the origin of *P. cinnamomi* in New Zealand, but have been unable to provide a definitive answer. Molecular techniques are now available which could be applied to provide just such an answer (Oudemans & Coffey 1991, Fry *et al.* 1993). Australian studies have demonstrated that invasion of indigenous communities by exotic strains of this fungus can have long-term effects on plant species composition and dominance (Weste 1986, Shearer & Dillon 1996).

The ecological consequences of non-pathogenic exotic fungi invading indigenous ecosystems have not been considered in New Zealand. Examples of introduced fungi known to occur in indigenous plant communities include the wood-rotting *Favolaschia calocera*, and the ectomycorrhizal species *Amanita muscaria* (illustrated on cover) and *Suillus piperatus*. All three species have the potential to displace native species from the communities in which they occur, to disrupt natural fungal successions in these communities, or perhaps to disrupt the food chains of indigenous invertebrates.

Favolaschia calocera (the orange pore fungus) is a saprophytic species often seen fruiting abundantly on the fallen wood of many native and introduced hosts, especially in the north of the country. The first herbarium specimen of this conspicuous species is dated 1969, suggesting that it was first introduced during the 1960s. Although the individual fruiting bodies of this fungus are small, up to 25 mm diam., it fruits in large swarms and this, together with its bright orange colour, means it is unlikely to have been missed by earlier field mycologists if it had been present. *F. calocera* was recorded from both Auckland City and Mt Pirongia in 1969 and as far south as Nelson, Paparoa National Park, and the Chatham Islands

in 1986, 1992, and 1993, respectively. There are no records further south in the South Island, but it may still be spreading southwards. Casual observations suggest that in New Zealand this species is more common in modified habitats. It seems to be particularly common in forest remnants and can even be found on fallen wood in gardens. It may occur only rarely in undisturbed forest. The only other country from which this species has been recorded is Madagascar.

F. calocera appears to occupy the same niche as that of several indigenous wood decay fungi, and the abundance of its fruiting bodies at particular localities suggests that it may be displacing some of these species. Research on wood decay fungi in Northern Hemisphere forests has shown that fungal communities in rotting wood develop with characteristic groups of species. These change in both space and time owing to a series of complex factors including inoculum potential, the nutrient status of the wood and the changes to this with decay, antibiotic production, tolerance to environmental extremes, tolerance to invertebrate grazers, etc. (Rayner & Todd 1979). Species which dominate in the later stages of decay often do so because of their ability to displace earlier colonisers. Experimental introduction of additional highly competitive wood-rotting species to a natural wood-decay community can have marked effects on community dynamics and functioning (Coates & Rayner 1985). Little is known about the competitive ability or persistence of *F. calocera*. However, the abundance of fruiting bodies formed suggests that this fungus colonises large volumes of the supporting wood, presumably displacing earlier colonisers. It may be more competitive in disturbed ecosystems, possibly having a greater environmental tolerance than the indigenous species normally expected on fallen wood.

Amanita muscaria (the fly agaric) and *Suillus piperatus* (the peppery bolete) are ectomycorrhizal species introduced to New Zealand along with their associate host trees (oaks, pines) from the Northern Hemisphere. Both fungi are now widely distributed under introduced conifers; *A. muscaria* is also common under eucalyptus, oaks, birch, European beech, and chestnuts (Ridley 1991). Although *S. piperatus* is generally restricted to introduced conifers in New Zealand, it is capable of forming mycorrhizae with a broad range of hosts (McNabb 1968).

Typically, introduced mycorrhizal species do not associate with native hosts (McNabb 1968; Ridley 1991), although there are several records of *Amanita muscaria* under *Nothofagus* spp. in ornamental plantings. In addition to its occurrence in gardens, Stevenson (1958, 1962) reported *A. muscaria* in *Cyathodes* scrub bordering *Nothofagus* forest in the vicinity of Lake Rotoiti, Nelson. Subsequently this species has been collected from two sites with relatively undisturbed *Nothofagus* forest in the Nelson Lakes National Park area. Horak (1971) noted that he had found many fruiting bodies of *A. muscaria* in native bush with *Nothofagus* and *Leptospermum,* although the locality of these sites was not recorded. *A. muscaria* has also been reported from *Nothofagus* forest in Australia (Fuhrer & Robinson 1992, Simpson & Grgurinovic 1996). In 1996 *Suillus piperatus* was found with *A. muscaria* at one of the Nelson Lakes National Park sites.

Species of *Amanita* and *Suillus* are highly competitive, late succession ectomycorrhizae (Chu-Chou 1979, Dighton *et al.* 1986) and once established are likely to remain for a long period of time. They have the potential to displace native ectomycorrhizal species from *Nothofagus* forests.

The ecological significance of exotic fungi with the potential to invade indigenous forest communities in New Zealand may be far-reaching. Relevant issues include:
- What is the extent of the invasion of native ecosystems by exotic fungi?
- What are the biological consequences of these invasions?
- What characteristics allow some exotic fungal species to invade indigenous ecosystems?

How you can assist

Landcare Research is running a small research programme looking at the first of these questions. As examples we are using two of the fungi discussed above, *Amanita muscaria* and *Favolaschia calocera*. We are interested in any records of the *Amanita* species from under *Nothofagus* spp., manuka, and kanuka; and records of *Favolaschia calocera* from all habitats. Information required includes:
1. Locality (e.g., about 2 km from road, Nina River Track, Lewis Pass).
2. Grid reference (if possible). Either latitude/longitude, or NZMS co-ordinates.
3. Observer's name and address.
4. Date observed.
5. Habitat (e.g., dead wood in suburban garden, regenerating *Nothofagus* forest, etc.)
6. Associated tree species. For *Amanita muscaria* a note on any pine trees, or other exotic trees, in the general vicinity is important.

Photographs verifying the records would be useful, although not essential (photographs will be returned if requested). Specimens are not required. Note that both species typically develop fruiting bodies from late summer to early winter.

Records should be sent to P.R. Johnston, Landcare Research, Private Bag 92170, Auckland (email: johnstonp@landcare.cri.nz). All those providing records will be sent the results of the survey. Further copies of the information sheet enclosed with this *Newsletter* are available on request.

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■ *Stipa tenuissima*, and name changes in stipoid grasses

A week, they say, is a long time in politics. For *Stipa*, a grass genus of international interest, a period of just less than a decade has produced a major revolution in interpretation and consequently in the nomenclature of the group.

The possibility that American *Stipa tenuissima*, finestem needlegrass, previously unknown in New Zealand, could be in the first phases of becoming naturalised was raised by Ford in (1994). Rhys Gardner, Paul Champion and Peter de Lange (1996) predict it will ". . . soon be widespread". This possibility and the current need of the Biosecurity Officer, Auckland Regional Council, for names of *Stipa* for a list of weeds in Auckland, offer an opportunity to discuss the Stipoid Revolution and its possible effects over the names to use in the future for stipoids found in New Zealand.

Table 1. Name changes in stipoid grasses.

Names in N.Z. Jacobs, Everett, Connor & Edgar 1989	Names in Barkworth 1990	Names in Torres 1993	Names in Jacobs & Everett 1996
Stipa petriei			*Achnatherum petriei*
Stipa stipoides			*Austrostipa stipoides*
Stipa bigeniculata *			*Austrostipa bigeniculata*
Stipa blackii *			*Austrostipa blackii*
Stipa flavescens *			*Austrostipa flavescens*
Stipa nitida *‡			*Austrostipa nitida*
Stipa nodosa *			*Austrostipa nodosa*
Stipa rudis *			*Austrostipa rudis*
Stipa scabra *			*Austrostipa scabra*
Stipa stuposa *			*Austrostipa stuposa*
Stipa verticillata *			*Austrostipa verticillata*
Stipa neesisana *	*Nassella neesiana*	*Stipa neesiana*	*Nassella neesiana*
Nassella trichotoma *	*Nassella trichotoma*	*Stipa trichotoma*	*Nassella trichotoma*
	Nassella tenuissima	*Stipa tenuissima*	
Anemanthele lessoniana			*Anemanthele lessoniana*
Piptatherum miliaceum *			*Piptatherum miliaceum*

* Naturalised species
‡ Not found recently in Marlborough

Stipa, needlegrass, is of world-wide interest. Some species are important for grazing; some are colonising species; some are poisonous to livestock; some are aggressive weeds; and many are a nuisance to livestock because the pointed end of florets can penetrate the skin. There are about 300 species of *Stipa*, and about 100-200 species among 6 or 7 other genera in the tribe Stipeae.

The first comprehensive account of the stipoid grasses in New Zealand was by Surrey Jacobs, Joy Everett, Henry Connor and Elizabeth Edgar (1989) who listed and described the 12 species of *Stipa* found here, together with the other stipoids *Nassella trichotoma* (nassella tussock), *Piptatherum miliaceum*, and the native *Anemanthele lessoniana* (Table 1). This latter, now widespread in horticulture, has had a horrendous history being placed in five separate genera before settling at its present rank as a monotypic, endemic genus. That list of stipoids was reproduced in the pooid checklist of Elizabeth Edgar, Mary-Ann O'Brien and Henry Connor (1990). *Stipa tenuissima* was unknown in New Zealand at that time and therefore not included; it is not known to be naturalised in Australia (Jacobs & Everett 1996), but is present in South Africa where Arthur Healy collected it in 1978 (CHR 327138). There are no European records.

By 1990 Mary Barkworth had transferred many American species of *Stipa* to *Nassella*, and later (1993) about forty others to *Achnatherum*. The species found in New Zealand and affected by these proposals was *Stipa neesiana* (Table 1); *Nassella trichotoma* had been placed there much earlier. *Stipa tenuissima*, of no interest to us then, was also transferred to *Nassella*. For Argentina Maria Torres (1993) rejected outright Mary Barkworth's proposals and retained names in *Stipa* for the species found in the Province of Buenos Aires and elsewhere. Melica Muñoz-Schick (1990) restricted *Nassella* to four species all of which are Chilean, or in nearby Argentinean Andean areas; none is of concern to us. These two contrasting views, eighty or so species of *Nassella* in North and South America on the one hand, and four species of *Nassella* in Chile and Andean Central Southern Argentina, on the other, reflect the two poles of the interpretation simultaneously going on in that *Nassella* part of the stipoid grasses in the Americas.

The native stipoids in New Zealand and Australia were free from this New World argument, but Mary Barkworth & Joy Everett (1987) had foreshadowed taxonomic changes for Australian species of *Stipa* which had just been brought into a refined system only the year before (Vickery, Jacobs & Everett 1986). A decade after that important paper Surrey Jacobs & Joy Everett (1996) transferred all native Australian species of *Stipa* to the new genus *Austrostipa*. Species naturalised here are in Table 1. Their transfer also included the only native species we share with Australia - *Stipa stipoides* of the northern coasts and around Wellington and Nelson. *Stipa petriei*, native to the Waitaki River basin and Central Otago, was transferred

to *Achnatherum*, primarily a genus of northern North and South America in the New World, and of Eurasia and North Africa in the Old World. *Anemanthele* emerged unscathed, but just.

This then is the history of name changes in the stipoid grasses. Elizabeth Edgar and Henry Connor, the authors of "The Grasses" Flora of New Zealand Vol. 5 (in preparation), must decide what they will accept or reject even though the dictum "Swallow the revision whole" is often easier.

And out there in the provinces where the fieldwork is done, where acts and regulations are enforced, what should you do about this multiplicity of names? When all else fails, remain conservative. Each of the names in Jacobs, Everett, Connor & Edgar (1989) is a valid name and may be used unequivocally in any formal list, document, bylaw, rule ordinance or statute. What of *Stipa tenuissima* Trin. which was not listed there? It has a proper name, and an authority, and may be used like the others.

Stipa tenuissima, finestem needlegrass was brought into New Zealand by nurserymen under the name *Stipa tenacissima* - an easy mistake as the two names are similar, but the two species are very different (see Ford 1994). The first collection in August from Hikuai, Coromandel Peninsula, was of a cultivated specimen which was subsequently grubbed out, however the first adventive collection soon followed in October 1994 when DoC Botanist, Peter de Lange, collected it spreading from cultivation into the grounds of the University of Waikato (see also Gardner, Chapman & de Lange 1996).

Finestem needlegrass is native to continental Argentina, central Mexico, New Mexico and Texas. In Texas it grows in open rocky flats and slopes, on mountains, plateaus and arid valleys with an average rainfall of 300mm, and with soils and sites of extreme variability. The altitude range is 1500-2000m. In Argentina it is found from Rio Negro at its southern limit north to Tucuman; it seems to be common in the drier central and western regions. In 1995 one of us (Henry Connor) verified its identity by comparing the New Zealand specimens with native specimens in the Herbarium at Córdoba, Argentina.

Finestem needlegrass is a tufted perennial with very fine leaves up to 70cm long, 0.5mm wide, which feel very rough against the grain. The spikelets are 5-10mm long. The florets are approximately 3mm long with a bent awn about 60mm long. The glumes surrounding the florets are unequal, the upper glume is longer. At an early stage the lower half to three quarters of the glumes may be purplish. Seed setting is abundant. In Argentina the inflorescences of some plants may be exserted from the upper leaf sheath but still partly enclosed by it; in others the panicles are totally enclosed by the sheath or almost so. In the latter flowering is closed (cleistogamous).

Another apparently recent arrival, at least in Auckland, is *Stipa rudis*, a native of eastern Australia from the ranges of south-eastern Queensland and eastern New South Wales to Victoria. It has been collected in New Zealand from two localities, near Henderson, Auckland in 1989, and the Wairau River Valley, Marlborough in 1993. These two sites are well separated and it is probable that *S. rudis* arrived independently at each.

This species is a tall, wiry, open perennial tussock with finely rough leaves up to 35mm long and 2-5mm wide. The spikelet excluding the awn is 8-15mm long. The florets are 7-9mm with a bent awn 40-60mm long. The glumes surrounding the seed are unequal, the upper glume is 9-12.5mm.

The more general question concerns the possibility, or even the probability, that a species of *Stipa* will become a weed perhaps on the scale that nassella tussock achieved. Henry Connor, Elizabeth Edgar & Graeme Bourdôt (1993) examined the history of the spread of South American and Australian species in New Zealand, and found that five tall, stout Australian migrants had not expanded their distribution very much since their arrival. Two shorter Australian species, *S. nodosa* and *S. scabra*, established their present distribution pattern before the turn of the century: *S. scabra* occurs from Marlborough to Canterbury and Waitaki Basin, in modified grassland to 250m, and *S. nodosa* occurs in Marlborough, Canterbury and Otago in dry pastures, riverbeds and roadsides to 250m. Both species have sickle-shaped awns unlike the others which have prominent knee bends.

Chilean needlegrass, *S. neesiana*, also of Argentina, was originally in Auckland and Marlborough like *S. rudis*. It has been in Hawkes Bay since the 1960s as a result of seed contamination. It seems it is expanding its distribution, if slowly, in both Marlborough and Hawkes Bay. For the other naturalised species of *Stipa* - the Australian species (see Weed I.d. News no. 13) - Connor, Edgar & Bourdôt (1993) concluded that ". . . their expansion into weedy species that could give rise to national concern is unlikely, and their weed potentiality is slight".

What can one predict of American *S. tenuissima*, finestem needlegrass, in the light of that assessment? Gardner, Champion & de Lange (1996) expect it ". . . will soon be widespread". In New Zealand it sets seeds as do many species of *Stipa* in either open or closed flowers. Unlike Chilean needlegrass it lacks seeds hidden on the base of the stem and the advantages that flow from them. As far as we know it also lacks the nassella tussock dispersal habit where the whole inflorescence breaks off at one node on the stem and can become airborne. The florets are small and the awns are about 20 times as long; no other species of *Stipa* in New Zealand has such small florets except perhaps the uncommon *S. verticillata*. It could be the overall lightness of the florets, and the ease with which they detach and then cling to anything brushing against them that will assist dispersal; they are very free on the inflorescence and seem weakly attached.

We can only hope that this is not another South America stipoid like the infamous *Nassella trichotoma* which is a significant pastoral weed with infestations from Kaitaia to Coromandel Peninsula, North Island east coast to Hastings, and on the South Island east coast from Marlborough to Otago.

And if esparto grass, *Stipa tenacissima*, had actually been imported its name might be found among species of *Achnatherum*. Chance plays funny games.

If you suspect that you have found either *S. tenuissima* or *S. rudis* please send specimens into the Plant Identification Service for positive identification.

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■ The effect of recent Mt Ruapehu eruptions on the subalpine and alpine plants

Mt. Ruapehu (2797 m), an andesitic volcano and the highest peak in the North Island, has erupted c. 50 times since 1861. Most eruptions have been phreatic, involving steam explosions caused by the contact of lava and water, from the Crater Lake. Until 1995 the largest recorded eruptions had occurred in 1945, when ash fell across much of the North Island, and in 1953, when a lahar destroyed the rail bridge across the Whangaehu River causing the loss of 151 lives. In September 1995 Mt Ruapehu entered a new phase of eruptions, following months of increased seismic activity, rising lake temperatures, and increases in the magnesium and chloride concentration of the Crater Lake. Volcanic activity continued at heightened levels through until late October 1995. Throughout the eruptions ash plumes were produced, with some reaching

as high as 19 km into the atmosphere. Most of the erupted volcanic material was deposited to the north and east of the crater.

Volcanism has played a major role in shaping the landscape and vegetation of the North Island but rarely do botanists get the chance to study the effects of eruptions first hand, most of the knowledge about eruption effects being gained by reconstruction of past events by macrofossil and microfossil analysis. Foundation for Research Science and Technology contingency funding enabled us to initiate a research project to determine the effects of the new ash deposits on the subalpine and alpine plants. Fortuitously, for us, a further eruption of Mt Ruapehu occurred in June 1996 after the research had been initiated.

For the main part of our research, we measured eleven 20 m^2 plots in the Tukino sector of Mt Ruapehu to determine the effects of the ash deposition. The plots were positioned along an altitudinal (1500-1760 m) and impact gradient (c. 3-6.5 km from the crater). For background information on the vegetation structure and composition prior to the eruptions we relied mainly on the 1984 B.Sc. Hons dissertation by Graham Leslie and Ian Atkinson's 1981 vegetation map of Tongariro National Park. Our research is as yet far from complete but we thought it would be useful to summarise some preliminary findings now while the memory of the recent eruptions is still so fresh.

In brief, our February 1996 measurements show that, following the September/October 1995 eruptions on Tukino mountainslopes, foliage death ranged from 50% of total cover at 1760 m above sea level (a.s.l.) to 34% at 1500 m a.s.l. Mean ash depths ranged from 65 mm to 25 mm along this altitudinal gradient. The ash is characterised by a high sulphur content and the potential to increase soil acidity. Below 1500 m foliage death was generally insignificant. Species which suffered the greatest damage tended to be those of small stature, for example, *Luzula colensoi*, a diminutive woodrush, was completely wiped out between 1520 m and 1760 m a.s.l. Similarly, the cushion forming mosses, *Racomitrium* and *Andreaea* were severely damaged in the same zone. Ash depth per se was not significant, rather the length of time ash persisted before being washed off by rain. Of the two dominant species in this zone, the small shrub *Gaultheria colensoi* was most affected (40–60% foliage death) as ash tended to accumulate on its horizontally-oriented leaves more than on the erect needle-leaves of the bristle tussock, *Rytidosperma setifolia* (11-30% foliage death). However, in February 1996 *Gaultheria colensoi* was already recovering well via resprouts. The composite herb *Helichrysum* "alpinum" showed similar levels of defoliation to *Gaultheria colensoi* but no resprouts were evident. New growth of *Anisotome aromatica*, a soft-leaved perennial herb, was noted emerging through the ash.

We are not yet able to adequately assess the effect of the June 1996 eruption as we have not yet analysed the data from our January 1997 remeasurements but general observations suggest that significant further damage has occurred in the higher altitude (1600 m – 1760 m a.s.l) part of the study area with many of the *Gaultheria colensoi* resprouts having been killed off.

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BIOGRAPHY/BIBLIOGRAPHY

■ Biographical Notes (25): James Ronald Le Comte (1927 - 1987)

Jim Le Comte was born at Little Akaloa, Banks Peninsula, on 10 July, 1927, and attended Addington Primary School and Christchurch West High School. He then worked as a farmhand in North Canterbury at Cust and on the Mt. Pember Station, where he became familiar with the Puketeraki Range, and was a keen deer-stalker. While visiting friends in Dannevirke he met Jean Luscombe and they were married there in 1953 (1, 2, 3).

After living at Sherwood (north of Ashburton) and then Methven, the Le Comtes bought five acres between Winchmore and Lauriston in 1957, where Jim continued to work on fencing and farm buildings. In 1962, he became interested in alpine plants and their cultivation. Some of these he had seen in the garden of Mrs Cotterill of Mount Hutt. She lent him books and he bought some plants from her. Those of *Gentiana sino-ornata* he multiplied in the paddock (2). His first advertisement in the "New Zealand Gardener" appeared in August, 1966, and announced: "Glorious Blue Gentiana. Sino-ornata. Beautiful vivid blue trumpets in late summer and autumn. Ideal for front border and rock garden. Hardy. Vigorous plants, 4

for 10/-, 10 for 20/-. Cash with order. Alouette Nurseries, 2 RD, Ashburton". Plants were also supplied to Woolworths as well as packets of resting "buds", (2).

From these beginnings evolved the mail-order business of "James R. and Jean A. Le Comte, Specialists in Choice Alpine Plants, Dwarf Rhodos, Conifers and Miniature Shrubs". Their first catalogue appeared about 1972 (2). Gordon Collier (4) recalled: "The name Alouette has become synonymous with quality, excellence, and rarity. Their twice-yearly catalogues have offered a quite extraordinary range of choice plant material over the years, much of it extremely rare even by world standards. The arrival at our house of parcels from Alouette has always been a red-letter day. The plants invariably arrived in immaculate condition and were unpacked in a state of excitement. Alouette was never open to the public. Jim and Jean were fully extended maintaining their extensive garden and propagating and potting their nursery stock. Thus it was a rare honour and special treat to get inside the garden gate and see the full extent of their horticultural treasure trove."

On 18 December, 1966, Jim took Ian Tweedy (a fellow member of the Canterbury Alpine Garden Society), Lucy Moore and Jean Clarke (Botany Division, DSIR) to the Puketeraki Range (Mt. Pember) where they collected some 40 species of sub-alpine and alpine plants. Ian described this trip in the Canterbury Alpine Garden Society's Bulletin and Jim arranged its re-publication in the American Rock Garden Society Bulletin of January, 1970. On 8 December, 1968, Jim and Ian returned to the same area but were forced off the mountain by a violent westerly storm. Jim's interest in this particular area and one of the reasons for these visits was that he had memories from when he worked there (and before he became interested in gardening and botany) of seeing an alpine plant with bright blue flowers. He never found it (3).

In June, 1970, according to the *Ashburton Guardian*, (5) "Mr Le Comte called a meeting of people interested in furthering their knowledge of New Zealand and exotic alpine plants. The result was the formation of the Ashburton Alpine Garden Society which now [1987] has a restricted membership of 50." Jim's major interest among the native alpines was in the genus *Aciphylla* (Apiaceae), the spear-grasses, and by mid-1972 he had searched for them on the Puketeraki and Old Man Range, the Hunter Mountains and was growing them in his garden and propagating them from cuttings. As well as being in touch with Dr Lucy Moore and Mr Ian Tweedy, he was consulting Dr David Given and Dr John Hair of Botany Division, DSIR, and Mr Lawrie Metcalfe (Christchurch Botanic Gardens) (6). Then, on 27 July, 1972, he wrote as follows to Dr J.W. Dawson of the Botany Department, Victoria University, Wellington, who had been studying *Aciphylla* for some years.

"Dear Dr Dawson,

I have been advised to write to you by Dr David Given who gave me your address.

I am very interested in the genus *Aciphylla* and intend doing a lot of work on the subject this next summer and the next. Meantime I am trying to acquaint myself with some of the lesser known species and would be most appreciative of copies of reprints of any papers you have put out on the genus. I intend to photograph, record and collect from as many stations as possible and all will be available to yourself and Botany Div., Lincoln.

Hoping that you can help.

Yours faithfully

James R. Le Comte"

Thus began a correspondence spanning 14 years during which Jim wrote at least 96 letters to John Dawson, mainly about *Aciphylla* and distributed as follows: 1972 (4); 1973 (14); 1974 (13); 1975 (16); 1976 (8); 1977 (13); 1978 (16); 1979 (4); 1980 (4); 1981 (2); 1982 (0); 1983 (1); 1984 (0; 1985 (1). The originals of these letters have been generously presented by Dr Dawson to the library, Landcare Research, Lincoln, and copies returned to him. They contain graphic descriptions of Jim's expeditions into the mountains and useful comments on variation and species status based on observations in the field and comparative plantings in the Alouette nursery.

To reach remote peaks Jim needed helicopters, and this problem was resolved during an encounter in March, 1974, which he described to John Dawson as follows: "Two days later we hired a chopper to take us to Mount Stevenson which is an outlying peak of the Paparoas but about the same height. Reason was that this area was closer to Reefton (only about 1½ days hike) than the main range, just in case they

couldn't get back to get us. On the top at 6am with the prospect of 12 hours of botanising but 2 hours or so later it was raining heavily and we had to pitch our tent and climb into our bags (we were cold and wet) and just wait. It didn't clear and we expected to spend the night there as it was very foggy etc. But at the appointed time we were really thrilled to hear the beat of the chopper blades and I still can't work out how he found us, or how he got us down to Reefton, but we had a hot meal that night that we had not thought we'd be having, and a long session in the hostelry until 1am." Thus began Jim's friendship with Alpine Enterprises, whose pilot (Phil Meltzer) and shooter/co-owner (Ivan Wilson) became his good companions, interested in his work and always ready to move him about in the mountains while they shot or captured deer in their allotted block.

The following itinerary of Jim's movements is compiled from his letters to Dr Dawson, his articles in the American Rock Garden Society Bulletin (7), and information from Dr Dawson.

1973 Jan. with an American friend, Paul Palomino: Mt. Cook (Hugh Wilson), Fiordland (Hector Mts; Borland Pass), then Woodside Gorge (Kekerengu), Blackbirch Ra., Mt. Augustus, Mt. Alexander (helicopter), Craigieburn Ra. *Feb. (late)* with Greg Hooker: Old Man Ra., Fiordland: Hector Mts; Jane Peak, Eyre Mts(Ian Spence); Mt. Burns, Hunter Mts. *May* with family: Takaka, Lake Sylvester.

1974 Jan.(late) with J.W. Dawson: Dansey's Pass, Kyeburn, Mt. St. Bathans, Old Man Ra.; *Feb. (early)* with American friends and Jean: Arthur's Pass, Otira Valley, Mt. Hutt. *Mar. (early)* with Greg Hooker: Wairau Valley (Mt. Fishtail, Richmond Ra.), Reefton (helicopter to Mt. Stevenson). *May* with friend: Fiordland (Borland Pass Rd; Hummock Peak, Eyre Mts.) *Dec.* with Greg Hooker: Mt. Richmond (Richmond Ra.), Mt. Ajax, near Lake Sumner (helicopter).

1975 Jan. 3 with American friends Dick and Herb Redfield: Kirkliston Ra., South Canterbury. *Feb.* with Ian Tweedy: Mt. Hutt (3). *Feb. (mid)* 2 days with Alpine Enterprises: Nardoo Mts., between Glenroy and Matakitaki Rivers. *Mar. 22* Mt. Potts. *Oct.* talked to the Canterbury Botanical Society ("Some notes on the genus *Aciphylla*")

1976 New Year holidays Banks Peninsula. *Feb. (mid)*, 3 days with Alpine Enterprises: Mt. Mueller, Mt. Cann, head of Glenroy River. *Mar. - April* with J W Dawson: Pisa Ra. Hakatarameas, Richmond Ra., Grampians, Old Man Ra., Nevis Valley, Coronet Peak, Eyre Mts., Mt. Hutt. *June 30 - Aug. 15*, USA and British Columbia, where he gave an invited talk to the Fifth International Rock Garden Conference at Seattle on "American Plants in Cultivation in New Zealand" and spoke to the Northwest Ornamental Horticultural Society (Seattle), and other groups, on New Zealand plants.

1977 May with family: Te Anau. *Nov.* visit from Hugh Wilson and Colin Webb.

1978 Jan. 11 with Alpine Enterprises: Rocky Tor (Lyell Ra.). *Feb 2 - 6* with Alpine Enterprises: The Haystack (Matori Ra.), Mt. Newton (Newton Ra.) Rocky Tor (Lyell Ra.), Glasgow Ra. *Mar. (early)* with J W Dawson: Mavora Lakes, Eglinton-Milford, Hector Mts, Treble Cone (Harris Mts.), Crown Ra. In this year Dawson and Le Comte published a progress report in *Tuatara* on their work on *Aciphylla*. This commentary marks an important advance on the previous monograph by W R B Oliver (*TRSNZ* 84, 1956) and includes a division of the New Zealand mainland plants into large and small species with 6 groups in the latter.

1979 Jan. 4 "Have not been into the mountains and looks like I'll be too busy to do so until Feb. *Feb* with Alpine Enterprises: brief trip to Brunner Ra. *May - June* two months in the USA including one month in the eastern states and attending a conference in Vancouver and judging Rhododendrons at the Portland (Oregon) Show. In this year Dawson described *Aciphylla lecomtei* choosing type specimens from material collected by him and Le Comte on the Hector Mts. in March, 1978; and Le Comte described his rediscovery of *Aciphylla trifoliolata* on Rocky Tor (Lyell Mts.) in 1978, the first gathering since its discovery in 1906 (*NZJB* 17, 1979).

1980 April 20 "apart from having no spare time, the weather has been so lousy this summer that I did not get into the mountains at all and lost quite a few of my garden grown specimens too."

1981 March 13 "just couldn't get away this season." *Mar. 20 - May 22* in UK and Europe where he spoke to the Alpines '81 Conference at Nottingham on New Zealand alpine plants and visited Switzerland and Austria, before spending 6 days as a guest of the Czechoslovakia Alpine Garden Society. In this year Le Comte and Webb showed that *Aciphylla townsonii* was based on a juvenile or sheltered habitat form

of *A. hookeri*. This resulted from Jim's field work on Mt. Stevenson (1974), Lyell and Glasgow Ranges (1978) and the Brunner Ra. (1979) as well as garden observations.

1982 No information.

1983 March 4 with Alpine Enterprises: "had a quick trip to Reefton recently and had 2½ hours on a spur that connects the Victoria Ra. with the Brunner Ra."

1984 In this year Jim had a massive heart attack with no chance of recovery. He spent his last 3 years on medication with frequent spells in hospitals (2).

1985 July 11 "Always too busy to get away to the Mts but must make the effort because I really want to pick up where I left off".

Jim Le Comte died at Princess Margaret Hospital, Christchurch, on 11 September, 1987, at age 60, after a short illness. His wife, Jean, continued to run the nursery until 1991 when she chose to sell it and retire to Ashburton.

I met Jim Le Comte only once, and then briefly. Characteristics often mentioned are his forthright approach, enthusiasm and energy. He once wrote to John Dawson: "When I travel to the mountains I like to move fast from place to place - sometimes at night so as not to waste the days". His talent for descriptive writing is shown in his excellent series "In search of *Aciphylla*" which also gives interesting information about other alpines, particularly celmisia.

Gordon Collier remembered that "an evening with Jim was one to be savoured; plant talk a-plenty, books and slides, and more slides until the early hours of the morning. On such occasions Jim revealed his warm nature and the full extent of his horticultural knowledge. He was a real enthusiast. As well as being one of the most accomplished nurserymen in the country, Jim Le Comte was an authority on New Zealand alpine plants and in particular the genus *Aciphylla*. *Aciphylla lecomtei* perpetuates this interest and his memory. Jim was also a keen philatelist, and above all a family man. He will be greatly missed by all his customers and by all who knew him. His passing leaves a tremendous gap in gardening ranks" (4). And - we could add - in the ranks of botanists as well.

Acknowledgments
I am particularly indebted to Mrs Jean Le Comte (Ashburton) and Dr J.W. Dawson (Victoria University, Wellington) for help with this note, as well as to Mr Ian Tweedy (Christchurch), and Mr Charlie Challenger (Banks Peninsula).

References
(1) Death Certificate; (2) Jean Le Comte pers. comm.; (3) Ian Tweedy pers. comm.; (4) Gordon Collier: Jim Le Comte *N Z Gardener* Nov. 1987; (with portrait of Jim and Jean in the garden at Alouette, 1984); (5) Anon. Obituary - James Ronald Le Comte. *Ashburton Guardian* 5 October, 1987; (6) Letter to J.W. Dawson; (7) James R. Le Comte: In search of Aciphylla *American Rock Garden Society Bull.* 1973; ditto 1974 *ARGS Bull.* 1974; ditto 1974-75 *ARGS Bull.* 1975; ditto 1975-76 *ARGS Bull.* 1976; ditto 1977-78 *ARGS Bull.* 1978.

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■ Leonard Cockayne's library and reprint collection

The Cockayne family in England were book-lovers and this trait was passed on to Leonard. Self-teaching was a characteristic of his education (1) and to assist this and his botanical research, Cockayne established an extensive science library as well as a large reprint collection which was built up by exchange with researchers throughout the world.

The Cockayne manuscript collection in the Museum of New Zealand includes an exercise book entitled, "Scientific Books of L. Cockayne". The first entry is Index Kewensis, 1893-95 and the second is Kirk's "The Forest Flora of New Zealand" (1889). 1512 items are listed in this index. I have commented that it was a pity the Cockayne library was dispersed (1). However, many books went to friends and colleagues and some institutions after his death in 1934. A substantial number of books and reprints were received on 25 June 1931 at the former DSIR's Plant Research Station at Palmerston North and were eventually incorporated into DSIR's Botany Division library (LIPL, now Landcare Research) at Lincoln.

Items from Cockayne's library from time to time reach second-hand booksellers and it has been my good fortune to receive as a gift from Mr John Palmer of Arnold Books in Christchurch (New Zealand's premier natural history bookshop) some small books which had been part of Cockayne's library during his early formative years in science. They help provide an insight into his broad interests in science during these formative years.

In December 1995 Mr Palmer gifted 5 small books (15.5 x 10.0 cms) in "The Story" series published in London by George Newnes Ltd: "The Story of the Plants" (Grant Allen, 1895), "The Story of the Stars: Simply Told For General Readers" (George F. Chambers, 1895), "The Story of Life's Mechanism: A Review of the Conclusions of Modern Biology in Regard to the Mechanism which Controls the Phenomena of Living Activity" (H.W.Conn, 1899), "The Story of the Wanderings of Atoms: Especially Those of Carbon" (M.M.Pattison Muir, 1899), and "The Story of Animal Life" (B. Lindsay, 1902). These books have Cockayne's signature on the title-page and the first and second also include his Tarata Experimental Garden stamp in red. This stamp was first recorded in Eric Godley's "A century of botany in Canterbury" (2). Two books also have cancelled Dominion Museum stamps indicating the provenance of the books. The first book does have a title similar to Cockayne's first published book, "New Zealand Plants and Their Story" and he may have copied the title.

In January 1997 Mr Palmer gifted a further three small volumes (15.5 x 10.0 cms) in the "Science Primer" (London, Macmillan and Co.) series from an even earlier era when Cockayne was school teaching (1). Again they have his signature on the title-page (and one has a Dominion Museum stamp): "Geography" (George Grove, 1877), "Geology" (Archibald Geikie, 1878), and "Astronomy" (J. Norman Lockyer, 1880). These are the earliest examples I have seen of books from Cockayne's library.

It was fortunate that some of Cockayne's manuscripts, notebooks, etc. were safely lodged in collections at the Auckland Museum and at the Museum of New Zealand. However, other papers and documents were destroyed when the lessee of the Cockayne home in Ngaio wanted space in the washhouse where they were stored (3).

A substantial part of Cockayne's reprint collection was incorporated into the library of his friend and colleague Dr H.H. Allan (1882-1957), initially at the former DSIR's Plant Research Station, Palmerston North. Allan was later to become the first Director of DSIR's Botany Division and the reprints were incorporated into the Division's library (later Landcare Research, Lincoln). The reprint collection represents the progress in botanical science in the early 20th century, and in addition provides a clue to the development of Cockayne's research. In 1996 the Cockayne reprint collection together with other older botanical reprints were disposed of to provide much-needed space for the expanding Landcare Research library. The librarian (Mrs Margot Bowden) kindly gave me permission to select out and retain the Cockayne reprints.

The 358 reprints I have retained have been incorporated into my Centre library. They are identified as coming from Cockayne's library by his signature "L.Cockayne" on the reprint, and by a turquoise-coloured stamp "The Leonard Cockayne Collection" in Roman lettering. Sometimes the earliest reprints include a number added by Cockayne. Later reprints just have the stamp without Cockayne's signature or number. The oldest reprint I have is number 424 (*The Torrey Botanical Club,* 1899) and the most recent numbered reprint is 1935 (*The Botanical Gazette,* 1912), clearly the collection is incomplete. Many reprints are ('er-stamped with "Property of H.H.Allan".

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(1) Thomson, A.D. 1983: "The Life and Correspondence of Leonard Cockayne". Christchurch, Caxton Press, p.32.; (2) Godley, E.J. 1967: A Century of botany in Canterbury. *Transactions of the Royal Society of N.Z.* (General): 243-266.; (3) Thomson, A.D. 1985: What happened to Leonard Cockayne's papers after his death at Ngaio in 1934? *Botany Division Newsletter No.106: 7-8.*

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PUBLICATIONS

■ **Publication announcement**

A plant conservation strategy for Wellington Conservancy, Department of Conservation

A plant conservation strategy for the Wellington Conservancy has been published recently by the Department of Conservation (Empson & Sawyer 1996). That strategy describes the Department's responsibilities for the conservation of indigenous plants in the Wellington Conservancy. Wellington Conservancy is one of fourteen regions of New Zealand's Department of Conservation and is situated in the lower half of the North Island.

The Wellington Conservancy prepared the strategy with assistance from many people including: Departmental staff (such as Colin Ogle and Peter de Lange); local expert botanists (such as Tony Druce and Tom Moss); local expert plant growers (such as Tony Silbery); staff at Otari Native Botanic Gardens (such as Mike Oates, Carol Leach and Anita Benbrook); staff of several tertiary institutions (such as David Given, David Norton, Kath Dickinson and Mike Orchard); and members of the Wellington Botanical Society (such as Barbara Mitcalfe and Chris Horne).

A checklist of indigenous plant taxa of greatest conservation concern in the region is included in the strategy. That checklist includes:

- plant taxa which are threatened and are in danger of extinction nationally or regionally;
- plant taxa found only in the conservancy (local endemic);
- plant taxa important for the survival of other threatened taxa;
- plant taxa that are uncommon (either found at only a few locations or widespread but never abundant); and
- plant taxa for which limited information is available about their geographical distribution or their status in the wild.

Objectives for management of indigenous plant taxa are included in the strategy and many of the tasks to be undertaken to protect (and where necessary restore) indigenous plants of the regions are described.

The role of the Wellington Plant Conservation Network is also described in the strategy. The Network is a group of agencies and individuals including: representatives from local authorities (city and regional councils); expert growers of indigenous plants; members of the Wellington Botanical Society; and staff of the Department of Conservation. Network members meet annually to take responsibility for particular plant conservation projects. At present the network is focused on ex-situ cultivation of threatened species to generate material for future species recovery projects and to provide an insurance in case of extinction of the species in the wild.

In the Wellington Conservancy thirty-eight populations (over 50%) of nationally threatened vascular plant taxa occur outside of the existing framework of reserves and conservation areas (Sawyer, in press). The Department of Conservation now works with affected land owners to protect those wild plant populations to ensure that they continue to exist.

Future work for the network will include ecological restoration of the plant communities in which threatened species are found and continued protection and inspection of existing wild populations of those species. Much of the success of Wellington Conservancy's plant conservation initiatives to date can be attributed to:

- the development of a regional red data list of plants of conservation concern
- the establishment of a plant database to store information about the geographical distribution of all indigenous plant taxa that occur in the region
- the existence of a network of individuals and agencies working to achieve common objectives for the conservation of indigenous plants.

Copies of the strategy may be purchased (price NZ$15) from the Wellington Conservancy, Department of Conservation, Box 5086, Wellington and are also available from libraries. More information about the strategy, the regional plant database and species recovery projects may be obtained by contacting the Wellington Conservancy.

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Empson, R.A.; Sawyer, J.W.D. 1996: Plant Conservation Strategy - Wellington Conservancy. Department of Conservation, Wellington, New Zealand.
Sawyer, J.W.D. (in press): Plant conservation outside reserves in the lower North Island. Proceedings of the conference "Conservation Outside Nature Reserves", February 1996, University of Queensland, Brisbane, Australia (edited by Peter Hale and David Lamb).

John Sawyer, Department of Conservation, PO Box 5086, Wellington

■ Book Reviews

Field guide to the New Zealand orchids

This inexpensive ($8 including postage), 122 page field guide by noted orchid experts Ian St George, Bruce Irwin and Dan Hatch is available from the New Zealand Orchid Group (c/- I. St George, 22 Orchard Street, Wellington). All currently recognised entities (110 taxa), including many with only tag names, are illustrated one per page. The epiphytic orchids are treated first followed by the terrestrial orchids, in alphabetical order by genus. Each is briefly described, and their distribution is also shown on an inset New Zealand Ecological Region map. At this price how can one be critical? However we do have some suggestions for improvements for the next edition. A generalised figure of an orchid plant with parts, especially flower parts, labelled would be useful for the beginner orchid buff. Also it would be useful to consider including a definition for a species and a warning about what is meant when a tag name is used, i.e., it is an hypothesis that the entity may possibly be an undescribed taxon. Depending on the results of critical examination some may warrant recognition as a variety, subspecies or even a species whereas others may prove to be merely population level variation. We noticed a few typographical errors e.g., the reference to Cooper's 1983 paper on p9 is incomplete. We also wondered about some of the distributional data e.g., *Prasophyllum* aff. *patens* is not shown as occurring in the Egmont Ecological Region despite published records, and the text for *Corybas rivularis* p46 does not correlate with the distribution map. But, these minor points will no doubt be subject to revision in future reprints, as without doubt this field guide will be highly sought after by all with an interest in New Zealand orchids.

Editors

Microalgae: microscopic marvels

This 164 page popular account of microalgae by New Zealand's foremost microalgae researcher Vivienne Cassie Cooper is available from Riverside Books, P.O. Box 7054, Hamilton for $30 plus $5 packing and postage. Fifteen chapters are headed with interest catching titles such as "Warm Water Wonders" and "Hidden Jewels in Lakes" and a diverse range of illustrations including watercolours of individual algae, black and white line drawings of individual algae and colour photographs of algae habitat are liberally spread throughout the text. Dr Cassie Cooper has an excellent ability to synthesise and simplify a large amount of scientific information, as evidenced by the extensive reference lists at the end of each chapter, into a readable, indeed exciting, account of these important but little-known organisms. The text concludes with a serious yet optimistic message about the importance of algae in the global ecosystem. This is followed by a glossary of technical terms, appendices containing a classification of the algal genera mentioned in the text, questions and activities suitable for secondary school students, and a comprehensive index of species and subjects mentioned in the text. As the back cover states, students, those responsible for monitoring water quality, and members of the general public with an interest in our environment will all find this a valuable book.

Editors

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