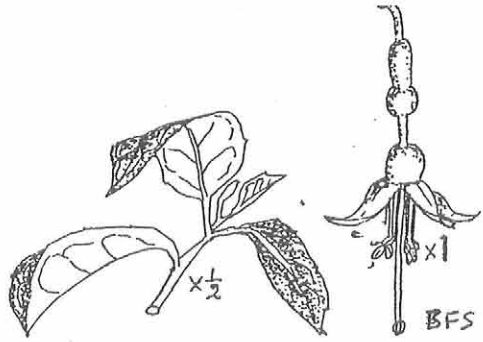
Botanical Society of Otago Newsletter. No. 8, 1988 September.



Botanical Society of Otago meetings

Tuesday September 13:

Dr. MICHAEL HEADS
of Botany Dept., Otago University, on
"VERONICA AND COPROSMA"

Veronica (including Hebe, Parahebe, Chionohebe & Leonohebe) ranges from cushion plants, through whipcord hebes, to trees. Coprosma also ranges from tiny herbs, through shrubs, to trees.

Dr Heads will discuss the patterns of plant form seen in New Zealand natives, and the strange distributions of many of our species.

7:30 pm, in the Visitor Centre, Botanic Gardens, Lovelock Avenue.

Wednesday October 12:

Dr. PETER JOHNSON
of Botany Division, DSIR, Dunedin, on
"BOGS AND BOG PINES"

The Canterbury bogs, glacial kettle lakes with their surrounding plants, and bog pine communities in the Esk Valley. With slides.

7:30 pm, in DSIR Building, Cumberland St.

Thursday November 17:

MOSS IDENTIFICATION WORKSHOP

Led by Ray Tangney of the University Botany Dept., It will not assume any prior knowledge of mosses. You're welcome to bring mosses along, but there will be some provided.

7:30 pm, Advanced Lab, Botany Dept., Otago University (enter from Cumberland St., down the drive at the back of the main Museum building).

The ecology of early Miocene plants of Central Otago

by Mike Pole, Dept of Geology, University of Otago

[a summary of his talk to the Bot. Soc.]

Sediments of the Manuherikia Group are found in many areas of Central Otago overlying the schist basement and underlying fanglomerate and glacial river outwash gravels. The work of Douglas (1986) has indicated that the sediments of the Manuherikia Group were laid down first in braided river valleys, then in and around a single, growing, Lake Manuherikia. Palynological results (Mildenhall 1987) give an age of early to mid Miocene for the sediments.

Study of the fossil macroflora has been progressing since 1983 and some tentative ecological models have been proposed.

An interesting feature of the flora is that individual plant fossil localities often provide a unique assemblage of taxa. This is irritating from a stratigraphic point of view but it does suggest that mixing of material from different communities was minimal. i.e. the distinct fossil assemblages represent distinct original communities or fragments of them. What caused this variety of communities ? It has been known for quite some time that relief in the Early Miocene was subdued, macroenvironments would have been at a minimum. It is not probable that the range of communities observed is a result of climatic fluctuations.

A number of fossils are present that suggest they were part of a hydrosere, adapted to varying water-tables. These include beds of ferns, beds of a parallel-veined, reed-like plants, beds of palm fronds, and several other forms of plant remains. Some of the dicotyledonous floras were probably also swamp communities.

A group of communities remain which could probably be regarded as "climax" and were controlled by factors other than water-table. Fortunately some fossil taxa do occur in the Manuherikia Group which I can, with reasonable confidence, assign to extant genera having defined ecologies. These taxa strongly suggest that fire was a dominant environmental agent. The key genera supporting this conclusion are Nothofagus, Casuarina, and Eucalyptus.

Casuarina has been described formally from the Manuherikia Group (Campbell and Holden 1984). Leaves assumed to be forms of Nothofagus were noted by Pole (1987). Eucalyptus is represented by

linear, sometimes falcate leaves with an intra-marginal vein, dense covering of oil glands, and associated "gum-nuts". The inter-relationship of these taxa with fire is based on the situation in Tasmania (Jackson 1968). Nothofagus is a closed-canopy taxon and is basically fire-sensitive. Eucalyptus , with some exceptions, is fire-resistant, even fire-promoting, and an open-canopy taxon. Casuarina is fire sensitive and an open-canopy taxon. Open-canopy taxa will not germinate under a closed-canopy. The presence of Eucalyptus in an area which would otherwise (due to high rainfall) be in closed-canopy rainforest, indicates destruction of the canopy by fire within 350 years (average age of Eucalyptus maturity). Any longer without fire and the mature Eucalypts die and the area reverts to rainforest.

Two sequences in the Cromwell region have been studied which show a variety of local communities interpreted to be open-canopy, closed-canopy, and mixed forests together with swamp vegetation.

Open-canopy forests contain Eucalyptus and sometimes Casuarina. Closed-canopy forests are dominated by broad-leaved taxa and conifers with no Eucalyptus, Casuarina or Nothofagus. The absence of Nothofagus here I believe is due to ground-water level. Mixed forests contain both Nothofagus and Casuarina, or Eucalyptus with rare Nothofagus.

Campbell, J.D. and A.M. Holden. 1984. Miocene casuarinacean fossils from Southland and Central Otago, New Zealand. New Zealand Journal of Botany. 22: 159-167.

Douglas, B.J. 1986. Lignite resources of Central Otago. Publication P104 New Zealand Energy Research and Development Committee.

Jackson, W.D. 1968. Fire, air, water and earth - an elemental ecology of Tasmania. Proc. ecol. Soc. Aust. 3: 9-16.

Mildenhall,D.C. 1987. Palynology and paleoenvironments of Miocene sediments, Central Otago, New Zealand (abstract). Time, Change and the Vegetation of NZ. 24-26 November 1987. Botany Division, DSIR, Christchurch.

Pole, M.S. 1987. Fagacean-like leaves from the Miocene of Otago. Geological Society of New Zealand miscellaneous publication 37A.

Can a cheeky visitor have anything worthwhile to say about South Island plants after a mere 7 weeks stay?

[Dr Andrew D.Q. Agnew, a botanist at the University College of Wales, recently spent 2 months working in Dunedin. BSO Newsletter asked him for his retrospective thoughts on N.Z. Botany.]

Firstly I must say that to see New Zealand's flora was a marvellous experience. It is morphologically much more diverse than any other I have seen, and it has a fascinating mixture of "primitive" and "derived" botanical forms for me, although we are taught not to use those sorts of words any more when discussing plants! Visiting the South Island has improved my knowledge of Botany and given me a friendlier acquaintance with so many New Zealand plants which are found in British gardens. I would like to thank Dr Bastow Wilson for making my visit possible, and all those who ever kindly told me a plant name. Alison Evans and Brent McKenzie very kindly took us around the Dunedin Botanic Garden, which was a great treat.

The New Zealand native flora

I should mention some of my impressions of the New Zealand native flora: the large number of dioecious species and the large percentage with fleshy fruits. I have not yet been through the floras with a tally of each, and perhaps my impression is weighted by the large number of Coprosmas. But to find berries of Lobeliaceae and Polygonaceae must be uncommon in a world sense. Is this an effect of oceanicity, as perhaps is the evergreen habit of your trees? Am I right in saying I saw no bulbous plant? All your Liliaceae are members of the asphodel group, and I saw no Oxalidaceae or other frequently bulbous family. I have plenty of rather negative questions like that but they are too easy and probably not based on adequate knowledge.

Replacement of natives by exotics

I suppose every botanical visitor has a shock when he sees the extent to which the indigenous New Zealand flora has been replaced by that of Europe. This was accentuated in our case because our first long journey was by bus from Christchurch to Dunedin, and we saw not a native plant it seemed until the outskirts of that great city. The thoroughness of Europeanisation is quite amazing: plants of every habitat have been brought in; there is no habitat so unique to New Zealand that foreigners have been unable to take over after disturbance. The last point is interesting, for there must be disturbance to allow the foreigners in, and yet disturbance cannot be a new feature in a landscape including such enormous braided rivers. We are not the first and will not be the last to comment on this.

Conserving exotics?

Now that there is a significant flora from overseas we may ask what the next phase will be. At present it is a special subset of alien plants which have gained a foothold, and these are rather generally distributed, or so it seems to us. Perhaps we may predict that the current subset will start to be in turn replaced by newer invaders and some will become as rare as true natives, only to be found in small areas in which, say, older agricultural methods prevail. What will be the response of botanical societies then? After all, these novel rarities may be the only representatives in the southern hemisphere!

Of course the situation has been experienced before, in Europe, where our field weeds first invaded (mostly from the Mediterranean, most probably in Neolithic times, 4000 years ago), then became intrusive and dominant in some crops. New agricultural methods have drastically reduced the wild flower weeds of cultivation, and now some are rare (many poppies, some daisy arable weeds) some extinct (notably the corncockle, Agrostemma githago). They can be kept going in museums of agricultural practice, such as the

increasing numbers of country parks in the U.K. where there is a display of prehistoric agriculture and settlement, but this kind of preservation seems to be a bit forced. The habitat needs to be reconstructed, not merely conserved, and in any case we are trying to retain a species which is not basically native. Why do we even consider conserving it? Surely the answer lies in our yearning for a diversity of plants around us? Is this not the reason we delight in gardens of all sorts, especially botanic or specimen gardens? So why is the presence of a plant in a garden not enough that we must try artificially to create conditions in which not just specimens but populations of a species can thrive?

I must say that I do not know the answers to these questions, but I am sure that they must be discussed in the next century or so as temperate plants continue to invade some areas, fade away in others.

The plants of new landscapes

The dominance of alien plants in disturbed areas is due to their faster growth rates and ability to take advantage of the increased nutrient flux which accompanies man's exploitation of a landscape. It is clear that the native plants cannot keep up with the invaders, and yet the landscape of New Zealand is barely 150 years old!

As I return to the land of the origin of most of the plants, Europe, I wonder whether our flora is but a residuum of the faster growing plants available to the Neolithic invaders of our western countries. Surely 4000 years of disturbance, cultivation and exploitation of every corner of our continent must have replaced an earlier, slower-growing set of plant communities? By the example of New Zealand this must have been so, and yet our pollen record tells us otherwise; there is no pollen type found in deposits over 100 thousand years old that cannot be identified from contemporary plants. To be sure the relative abundance of species must be very different, but it is difficult to find any example of extinction in pollen analysis. It is assumed that the rate of

disappearance of species is currently speeding up with the new agribusiness of chemically controlled land exploitation.

Post-agricultural landscape

I conclude, then, that in the field of flowering plant conservation there is room for hope but none for complacency. Native species, especially the larger, widely distributed ones, are difficult to remove entirely from a landscape (after all the ice ages didn't succeed in doing this). On the other hand our new agricultural techniques allow a much more efficient management of weeds and plant communities, so that small pockets of survivors become rarer and their chance of maintenance becomes smaller.

That brings me to my last topic in conservation: why is there no discussion of post-agricultural landscape use in New Zealand? It is clear to us in Europe that the "green revolution" has succeeded only too well. It has produced a food surplus which is an embarrassment because the only way to save the expense of its continual production and storage is to cut back on agricultural employment even more.

The potential that a less utilised landscape has for conservation is immense. Our [U.K.] foresters, who for years have tried to make us believe that forestry was good for conservation, now plan their "second rotation" around landscape and conservation values, although their opinion has hardened as to which crop tree to plant (Sitka spruce). Our university schools of agriculture are busy devising schemes where reduced production allows some monetary offtake from a "conservation area" on the farm. But I heard no mention of this great debate while I was in New Zealand. Perhaps I just missed it.

Janette West, 1915–1988

It is with sadness but with many fond memories that we record the death, after an illness, of Janette West, one of the founder members of the Otago Botanical Society, and one of its keenest participants. Dunedin was home for Janette, though as the wife of a minister and as a secondary school teacher she spent parts of her life in Europe, in the North Island, at Alexandra and at Oamaru. After so-called retirement from teaching she put much of her botanical knowledge into preparing herbaria to be lodged in specific areas of Otago. She was an enthusiast for field trips, whether with Forest and Bird Society, Dunedin Naturalists Field Club, Botanical Society, or under her own auspices, but inevitably with the aim of taking other people along, to share the delights and help hunt for plants. Janette had a keen eye for the unusual and was forever turning up interesting plant records, whether an odd looking Caltha from the Lammerlaws, a "northern" Pterostylis from the lower Taieri Gorge, or the rediscovered Myosotis albosericea from the Dunstan Range. One of her favourite stamping grounds was the Kakanui area, where the Wests had a holiday place, and no doubt Janette would be happy to know that Lepidium oleraceum survives and outlives her on headlands of exposed Kakanui coast, facing the sea and the salt and the sunrise.

P.N.J.

Botanical Society of Otago

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