letter, which they printed. Several people contacted me and I learnt that Merry Hill had been the name of a farm on the outskirts of Feilding. The grandson of the owner in the early part of the last century wrote to me and said the farm had been named after his grandmother, other people wrote and said they had played there as children, and one man had spread fertiliser on the farm in the 1930's. Dr H. H. Allan's connection with Merry Hill was that he had taught at the Feilding Agricultural High School and the school leased the farm for agricultural studies. One correspondent remembered being taught by him.

We were planning to visit the North Island and decided to look for the lichen now that we knew the location of Merry Hill. This was made possible by one of my contacts finding out who owned the land and arranging for us to be shown the bush on the farm, no longer called Merry Hill. It is at the back of what is now a deer farm and is not visible from the road. The bush must have changed greatly since Dr Allan collected lichens there. Part of the bush area was lost when the railway line was realigned and there has been a loss of understorey and herb layer through deer grazing and sheltering there. I could not find the lichen, so although I found Merry Hill I am still left with a problem --- why was *Ramalina australiensis* growing in bush near Feilding?

An intriguing possibility is that this is an old coastal forest as, during the Pleistocene period, the sea reached much further inland in this part of the North Island. Subsequently, falling sea levels formed new coastlines. Is this the reason *Ramalina australiensis* was found here, left behind in forest once growing on an ancient coastline? Or is this idea too fanciful, like the feeding patterns of Moa contributing to the evolution of divaricating shrubs?

REVIEWS

Divarication Debate – The Climate Perspective

Review by Allison Knight

Matt McGlone, a senior Landcare scientist, is the Royal Society of New Zealand's Cockayne Memorial Lecturer for 2001. He talked to an audience of nearly 200 in Dunedin this May, on **'Reconstructing the future: Past and present influences on the vegetation cover of New Zealand and future trajectories'**. His topic raised great expectations of an interesting debate, but there was never a mention of a moa. It was as if their influence as a dominant browsing species was irrelevant to the vegetation. Perhaps Matt was ducking for cover after William Bond's onslaught.

Apart from this notable omission, Dr McGlone gave a fascinating and thought-provoking address, extrapolating from his considerable body of work as a palaeo-ecologist. One cubic centimetre of sediment, he said, contains millions of pollen grains, and from identifying these grains, and estimating their relative prevalence over

geological time, changes in the vegetation cover, and in the climate, can be inferred. Matt explained that climate tends to swing in cycles of around 20,000 years, influenced by the earth's tilt and its elliptical orbit around the sun. He showed postulated forest cover for New Zealand starting from the last glacial maximum of 20,000 years ago. Back then the cold had driven the forest cover to the tip of the North Island. By 12,000 years ago it was still cold, but there were more patches of trees evident, and by 9,000 years ago NZ had reached a peak warm period, with pollen from sub-tropical plants like *Ascarina lucida* appearing.

By the time the Maori arrived around 800 years ago there was almost total forest cover, but then, from about 400 years ago, charcoal fragments began to appear in the geological record, and vegetation cover changed dramatically as vast areas of forest were burnt. Especially on the east coast, the pollen profile of forest trees such as mountain beech, rimu and kahikatea was replaced by that of 'fireweeds' such as bracken, manuka, matagouri, tussock, speargrass, spahgnum moss and sedges. Why burn such vast areas? Dr McGlone speculated that it was to increase ease of access to the coast and to the high country. But, as a keen tramper, I very much doubt that thick bracken or manuka, spiny matagouri or even tussocky, boggy 'cutty grass' would be easier to walk through than mature podocarp forest well tracked by large, heavy, browsing birds. To me it is much more plausible that fire was a useful tool for hunting out moa (that unmentionable word), just as fire has been used for hunting in other parts of the world.

So the forest cover when the first Europeans arrived was very much less than when the first Maori arrived, and the burning off continued, this time for farming purposes. Which brings us to the interesting point – at just what point and what climate in the past should we refer to when we talk about preserving or restoring the natural vegetation? Leonard Cockayne (1885 – 1934) was one the first ecologists to press for the preservation areas of native vegetation in New Zealand. Dr McGlone talked about the need to maintain 'Cockaynian refugia' or 'mainland islands' to preserve the species diversity of the indigenous gene pool. But he also questioned the cost and the feasibility of 'defending the Cockayne line' between native forest and encroaching farmland or exotic forest, as on Mt Egmont/Taranaki.

Plant species that survived the repeated glacial/ interglacial cycles were those that could retreat to small patches as the ice advanced, then spread out again as it receded. Climatic variation, repeatedly cutting back then opening up new niches, was, according to Matt, a major stimulus for increased speciation of forest edge plants such as *Hebe, Carex, Celmisia,* and *Coprosma*. Pollen and genetic records show that the divaricating forms of many species, unique to New Zealand, evolved in the last 2.5 million years.

Before his talk, I interviewed Dr McGlone to see whether, in the light of William Bond and Bill Lee's recent experiments, he thought that the presence of browsing moas had had any influence on the development of vegetation cover in New Zealand. Matt was adamant that he was not even going to mention the word 'moa' in his talk. He gave two reasons for doubting their influence. One was that the moa record went back for more

than 70 million years, whereas the evolution of most of the divaricating forms appears to have only happened relatively recently, in the last 2.5 million years, a period of great climatic change. The other was that so far the 14 moa gizzards that have been examined, from the 3 largest species of moa only, have contained fragments of tough twigs, as well flax and cabbage tree leaves, all of which appear to have been cut, not tugged.

TRIP REPORTS

Witherow & Birch Islands - *by Brian Patrick*

Recently-protected Birch Island (7 - 9 ha, depending on river flow!), in the Clutha River, downstream from Beaumont, has been the subject of much political debate. At the centre of this debate have been environmental columnist (ODT) Dave Witherow and local ACT MP and party spokesperson for conservation/environment Gerry Eckhoff. In a letter to the editor Gerry challenged ecologists to "visit another last remaining example just offshore from my property in the Roxburgh Gorge". He proposed the name "Witherow Island" for it. We took up Gerry's challenge. The chance to botanise an island that was previously unknown to us proved hard to resist.

Roxburgh locals transported thirteen BSO members, plus three Forest & Bird personnel from the Upper Clutha Branch, and Gerry, to the island on Saturday 19 May 2001. Witherow Island (G43 233 213) is about 500m long and very narrow, with two much smaller islands off its northern end. The island was created when the reservoir behind the Roxburgh Dam was filled about 45 years ago. The island has been burnt within the last 25 years, to destroy Nassella tussock. Although no live rabbits were evident on our visit, dead remains provided abundant evidence that they have had a part in modifying the island in the recent past.

The rocky island, with steep cliffs on its eastern margin, is mostly diverse grassland with regenerating shrubland of kanuka, *Coprosma propinqua* and *Helichrysum lanceolatum*. Woody weeds such as briar, willow, broom and gorse are present, with the enclaves of native shrubland often growing amongst the many rock outcrops. Lichens abound on the island growing on rock, vegetation and the ground. Among the latter were a *Siphula coriacea* which is under threat from *Hieracium*, and an unusual, unattached *Xanthoparmelia concomitans* not before recorded in the OTA herbarium.

A total of 64 plant species were found, of which 38 are native species typical of the drylands of Central Otago. In addition 27 species of lichen were recorded. Within the mainly exotic *Rytidosperma racemosum* grassland, the dead remains of three orchid species were common. A visit to the island in early summer would elucidate their identity, and also bring to light many herbs and grasses that by the time of our visit were undetectable.