The only introduced moss is Brachythecium velutinum of the northern hemisphere, which was first recorded in New Zealand by Allison (1952) with many collections made in Otago. There it is fairly common, although infrequently collected elsewhere.

A surprise was to find an ancient horse's skull thickly covered by a species of Tortula bearing gemmae on its leaves.

This gum plantation is scheduled for conversion to Pinus radiata in 1974 (Selwyn Plantation Board Annual Report 1972). The beauty of its towering trees with their smooth limbs and flaking trunks, and the diversity of its moss flora cause me to regret this.

I thank the Selwyn Plantation Board for permission to enter the plantation and to consult early records, Miss Lynda Stemmer and Mr. W.R. Sykes for the collection and identification of Eucalyptus specimens, and Mr. K.W. Allison and Mr. J.T. Linzey who examined specimens of Brachythecium, Astomum, liverworts, and Bryum.

REFERENCES

Allison, K.W. 1952: New records of northern hemisphere mosses in New Zealand. Trans. Royal Society N.Z. 80, 233-35.

Scotter, W.H. 1965: A History of Canterbury Volume 3 1876-1950. Christchurch. 547 pp.

Selwyn Plantation Board Annual Report 1964 and Review of First Fifty Years.

Selwyn Plantation Board Annual Report 1972 and Plan of Operation 1972-80.

MORE ABOUT OPHIOGLOSSUM

By: Brian Molloy

Comments on Ophioglossum by John Thompson in past numbers of this Journal prompts me to add a few observations of my own on this delightful but elusive little fern.

My first live encounter with Ophioglossum happened some years ago whilst investigating changes in the botanical composition of tussock grasslands in Otago following normal burning practice.

Before burning, which usually takes place in spring and is subject to permit, Ophioglossum can be seen here and there in short or tall-tussock grassland. However, some of these grasslands may not have been burnt for 10 or 15 years, sometimes more, sometimes less, and one has to search the inter-tussock spaces closely to find this diminutive fern. At best its frequency in unburnt grassland ranges from sparse to erratic. After burning, however, the sudden emergence of Ophioglossum on the blackened surface can be spectacular. At Mackenzie Pass, Kevin O'Connor and Nick Lambrechsten (N.Z.J.Agric. Res. 1964) recorded a 10% increase in Ophioglossum two years after burning. In parts of Otago I would rate this increase much higher, depending on the site and its burning history. With no further burning the frequency of Ophioglossum usually diminishes as the tussock cover is restored.

This sudden increase in Ophioglossum after fire could arise from plants already established but perhaps repressed by a dense cover of competing vegetation. On the other hand, Ophioglossum could be like Marchantia after a forest fire and seemingly arrive out of the blue - or is it the black? The first explanation is probably more correct. As a summer-green fern, with a thick root-stock, Ophioglossum is well suited to withstand competition and to survive tussock fires. Burning certainly stimulates vigorous growth and fruiting of Ophioglossum and periodic fires may in fact promote its spread like many other plants.

My second comment concerns the seasonal behaviour of Ophioglossum. Usually this fern emerges above ground in spring, fruits, and then dies back in autumn. This behaviour is supported by David Scott's records from Godley Peaks (N.Z.J.Sci. 1960) and most of the herbarium specimens at Lincoln collected from mountain districts. However, in the lowlands and in drier eastern districts its behaviour can vary. John Thompson (this Journal 1971, 1972) reports Ophioglossum emerging and fruiting on the dry hills of Banks Peninsula in June, following autumn rains. David Given's specimens at Lincoln collected in 1970 from Godley Head confirm this behaviour. In addition, a specimen collected by Peter Wardle in May 1971 from the Fox Valley, Westland National Park, also has fresh fruiting fronds.

At Harewood, Great Island and Bankside, Ophioglossum emerged and fruited abundantly in spring-summer 1969 and again, less abundantly, in autumn 1970. However, in the following spring-summer-autumn, 1970-71, very few plants emerged. In 1971-72 double emergence and fruiting was repeated, but I have not followed the behaviour since. Whether this behaviour is typical of the Plains environment is difficult to judge because we have had some particularly dry summers and mild autumns and winters of late. Normal behaviour seems to have been upset and precocious flowering has been evident. Perhaps we should

make more careful records of the seasonal behaviour of our plants?

My final comment concerns the altitudinal distribution of Ophioglossum. According to the good books it ranges from sea-level to 3,500 ft. On the other hand, John Thompson (this Journal 1971) has found O.coriaceum almost at the waters edge at Diamond Harbour, and at 5,170 ft. on Roy's Peak. This last altitude exceeds anything in the Lincoln herbarium and the reported altitudes published by Henry Connor (N.Z.J.Bot. 1964, 65) who has probably seen more Ophioglossum than all of us put together, with the possible exception of John Thompson. Ophioglossum is certainly wide ranging and is fairly common on undisturbed sites on the Canterbury Plains. Its upper altitudinal limits are less well known. It is not listed among the species recorded for alpine grasslands by Alan Mark, Michael Wraight, Colin Burrows and David Given (he should know!) but I suspect it reaches higher than we think. John Thompson's record from Roy's Peak suggests that it does. In this respect it is perhaps pertinent to recall H.B. Dobbie's remark, "Personally I have failed to find it, though it is fifty years since I began to collect ferns".

Throughout I have purposely avoided referring to any species of Ophioglossum, except to quote John Thompson's findings, and therein may lie the true answer to the behaviour and distribution observed so far.

CUSHION RAOULIAS OF CANTERBURY

M.J.A. Simpson *

The vegetable sheep Raoulia eximia is the most plentiful cushion Raoulia in alpine rocky ground and fellfield in Canterbury but in Central and South Canterbury R.mammillaris grows in similar situations and in North Canterbury R.bryoides can be present as well. These three species differ in many respects but it is possible to distinguish them just by looking at the leaves with a hand lens and comparing the upper, that is the outer and lower, or outer leaf surfaces.

R.eximia (1a and b) has the largest leaf, long and narrow in outline and rather papery in texture, with a tuft of long straight hairs at the tip on both surfaces, obscuring the leaf outline at the apex. On the lower surface the hairs are present along the length of the main vein.

* Mrs. M.J.A. Bulfin