Fiordland Expedition

In October 1948 when the Government finally decided to co-operate with Col. Howard in organizing an expedition to the wapiti country south of Milford there were only six weeks left in which to assemble the advance party and the necessary equipment. However in spite of hurried preparations and the flooding of the base camp the expedition was a success and much valuable information was collected. The primary aim of the expedition, which was under the scientific leadership of Dr. Murie, was, of course, to study the wapiti, but investigations on the rocks, plants and other animals were carried out by members of the staffs of museums and the Scientific and Industrial Research, Internal Affairs and Marine Departments. In addition the country was mapped—not without much hard work—by surveyors of the Lands and Survey Department.

In his Presidential Address on May 16, Mr. A. L. Poole, who was with the expedition for six weeks, described the country and its vegetation and assessed the damage done by wapiti. The state of affairs has now been reached in New Zealand—and how we regret it—when practically no vegetation can be studied without taking into account the population of introduced animals. In 1905 seventeen wapiti were liberated in George Sound; today the herd is estimated at 700 to 1200 head spread over 150 sq. miles (100,000 acres) mainly between George Sound, Caswell Sound and Lake Te Anau. The range to the south of Caswell Sound is apparently free of the animals and the vegetation still untouched. Some red deer have spread into the wapiti country and crossing between the two species is suspected.

The base camp of the expedition was beside the Stillwater River beyond beautiful Lake Marchant at the head of Caswell Sound. The idea that the expedition was in "unexplored country" is a myth; certainly the area had not been surveyed in any detail, but portions of it were very well known to wapiti stalkers.

The mountains, composed of a hard granitic gneiss, are the remnants of an ancient landmass that has been uplifted and intensely glaciated. Lakes caused by slips and moraines are frequent. There is practically no soil on the precipitous slopes and the forest trees are rooted in a layer of hepatics, mosses and plant remains which periodically slips off leaving the rock bare. During heavy rain—200 or more inches fall a year—the slopes of the mountains run with water.

Wekas are everywhere up to the bushline and are seldom out of hearing. Pigeons and bellbirds are common in the valleys and keas on the open tops.

In Caswell Sound the forest comes right to the high tide level of the sea. At the shoreline grow **Samolus repens, Lilaeopsis (Crantzia), Anisotome lyallii,** a variety of kowhai and autumn earina; this last

was very plentiful and in full flower at the time of the party's visit. In most of the forest silver beech is the dominant tree. Mountain beech is as plentiful as the silver along the shoreline but is rather scattered elsewhere. Rimu grows in some areas within the influence of the sea up to 300 or 400 feet above sea-level. Mountain toatoa (**Phyllocladus alpinus**) is present throughout. Here and there up to the bushline are bog forests dominated by silver beech and **Dacridium biforme** 20 to 30 feet high; the trees are widely spaced and the ground very mossy with sphagnum cushions. In the Stillwater Valley southern rata (**Metrosideros umbellata**) is co-dominant with silver beech on faces and is quite common on the valley floor. In the beech forests liverworts, mosses and lichens cover the trees from top to bottom and regeneration takes place for the most part on the trees and on logs—not on the forest floor. Fivefingers (**Nothopanax simplex, N. colensoi, N. anomalum,** pepper-tree (**Pseudowintera colorata**), treeferns (**Cyathea smithii** and **Dicksonia squarrosa**) and crown fern (**Belchnum discolor**) are prominent in the silver-beech forest of the valleys. On alluvial strands there are lacebark (**Hoheria glabrata**), kamahi (**Weinmannia racemosa**), wineberry (**Aristotelia serrata**), and groves of pepper-tree.

Boggy clearings are not uncommon in the valleys. Sedges particularly **Carex gaudichaudiana** are dominant in such areas, together with cushions of sphagnum and polytrichum moss. Round the margins coprosmas, pepper-tree and **Nothopanax anomalum** are common.

The tree-line is a bit over 3000 feet but in places is much lower. Mountain lancewood (**Nothopanax lineare**), mountain fivefinger (**N. colensoi**) and **Dracophyllum fiordense** grow in the forest near the tree-line, and **Olearia crosby-smithiana,** with narrow linear leaves, is sometimes a conspicuous and striking plant of the scrub. The tops of the mountains, which reach 5000 feet or so, are in tussock except for steep faces and ground covered with loose rock. The three important tussock grasses are all species of **Danthonia**—snowgrass (**D. flavescens**), needle-leaved danthonia (not yet named) and a smaller snowgrass (**D. crassiuscula**). In between the tussocks are celmisias (e.g., **C. holosericea**) coprosmas, gentians, forstera, donatia, dwarf astelia (**A. linearis**) and comb sedge (**Oreobolus**), to mention but a few of the plants. **Ranunculus lyallii** is now practically confined to steep slopes out of reach of wapiti and **Coprosma serrulata** appears to be nearly eaten out.

On the tops wapiti feed mainly on the snowgrasses, leaving the needle-leaved danthonia alone. Slopes on which the smaller snowgrass is dominant are especially favoured by the animals. It is interesting to note that some areas, not far from others heavily grazed, are left practically untouched. The same sort of thing is apparent down in the forest where parts are untouched, others damaged. In the valleys Prince of Wales Feather (**Leptopteris superba**), shield fern (**Polystichum vestitum**), tree fern (**Dicksonia squarrosa**), broadleaf (**Griselinia littoralis**) and the fivefingers are much eaten by the wapiti. The

sedge bogs are regularly grazed and shrubs round the margins invariably chewed whatever they happen to be. Above 300 to 400 feet the forest is relatively untouched, except that most pokaka trees (**Elaeocarpus hookerianus**) are barked, until at the bushline and on the tops damage is again evident.

In general the wapiti have done more damage to the undergrowth than to the dominant trees such as silver beech. Although wapiti have a low rate of increase they will have to be watched and their numbers kept down as far as possible. At this stage it is unlikely that they will ever be exterminated. —A.P.D.

Notes on Some Water Plants

R. MASON

LEMNACEAE

Three members of this family have been recorded in New Zealand: **Lemna minor,** L., duckweed, which is fairly common on rather still waters; **Spirodela oligorrhiza** (Kurz) Heglm., (as **Lemna oligorrhiza**), collected by T. L. Lancaster on a pond near Palmerston North in 1929; and **Lemna gibba,** L., recorded from Poverty Bay and not, apparently, seen again.

In October 1948 I noticed some plants like small green pinheads floating amongst some duckweed in a pond at Washdyke, South Canterbury. Examination showed that they were not seedlings of **Lemna minor,** as first thought, but something as interesting, one of the smallest known flowering plants, **Wolffia arrhiza,** Linn.

The plants were clear bright green above the water, about ¾ mm. long, elliptical in surface view, white below the water, and generally rather deeper than long; they were actively budding into two. They were found on only one of the many ponds and covered only a small area. By February the plants had increased greatly in number and spread to other ponds.

In December Miss N. M. Adams found the same plant on a pond near Waikanae Estuary and it was seen in February by Dr. Cottam of the Wildlife Branch of the U.S. Department of Agriculture in a river-cutoff near Palmerston North. On March 20 Miss A. Lush found it at the mouth of the Ohau River, this time in flower. It is a native of Europe, India, and Australia.

Spirodela oligorrhiza has recently been found again in the Manawatu district: Lake Karere, a cutoff of the Manawatu River, R. Mason 11/3/48, N. Moar! 24/3/49; Waikanae, A. Cook! 8/1/49; Ohau River mouth, A. Lush! 20/3/49; L. B. Moore! 6/6/49. It was found at Napier, R. P. Hill! May 1949.