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## FOREST USE.

(Abstract of lecture by Miss M. Sutherland, 24.11.42)

By "forest use" is meant more than "the uses of forests"; it implies also, the treatment of forests, so that growth may be induced to follow certain lines in order that the forest may fulfil such conditions as lead to its best utilization for man's needs.

The constantly changing demands of population throughout the ages have been reflected in the forest usage of the world. Starting as the dwelling place of primitive peoples and as a source of wild food, both animal and vegetable, forests later on became an obstacle to the growing of food crops, and this requirement, carried to excessive lengths by the increasing population, has been the basis of most forest denudation. The formation of game reserves by the nobility restricted the use of forests by the people and helped the signing of Magna Carta, but growing demands for construction material developed a forest value for timber production.

Protection Forests. Of equal importance to the community is the influence of forest or vegetative cover in stabilizing land surface, and in water supply conservation.

Dwellers in broken and high forested country have always known the dangers attendant upon forest clearing, and in such countries a type of forest use and protection has been evolved which prevents excessive destruction, and minimizes the risk of damage.

Heavy raingall or high winds, with lack of a vegetative cover lead to land erosion. On high levels there will always be a measure of erosion, caused by excessive run-off, and by natural weathering, and this fact must be

accepted. But in many countries this damage is descending on the lower levels as a result of land misuse, and this institutes one of the major problems in newly-settled countries today. Studies and investigations on this subject are already proceeding in America and else here, and, as it affects New Zealand, have been crystallized in the report of the recent "Erosion Committee of Enquiry" and the passing of the Soil Conservation Act.

Clearing of forest growth as such is not the cause of erosion unless the soil cover also has been destroyed; a good unbroken grass cover can function to the same degree as tree growth. But in New Zealand adequate grassed areas have, in many cases, been allowed to deteriorate by bad grazing and excessive burning, and for this the blame lies with the pastoralist.

The belief that planting trees on high levels is panacea to erosion is erroneous. Such afforestation, either by exotic or native species is not feasible, either physically or economically. The only remedy is the conservation, on vulnerable uplands, of ground cover, both forest and pastoral. In New Zealand the former has been carried out extensively, though belatedly, in recent decades, by the demarcation and proclamation of vulnerable forest areas as Protection Forests, in which no milling contracts are let, and which are under special protective management. In the last ten years a million acres have been added to the eight million acres of already existing state Protection Forests. Formation of catchment areas to safeguard municipal water supplies has been carried out by allthe big towns of New Zealand.

Control of water supplies and protection of land ace affected by several influences, and the first step in control is the detailed examination of all areas liable to erosion, so that correct land use may be applied. This must be obtained by the co-ordination of all interests, public and private, forest and pastoral.

demands of Industry. The changing needs of population and industry are the controlling factors in forest usage. Number requirements of the Elizabethan age demanded open-grown oak woods; later on the same class of branchy timber was utilized for the "wooden walls" of the British poet, and the type of silviculture necessary to produce is growth was the only one recognized for ... centuries present demands require long straight stems and the treatment of forests has altered to produce these. Trees are grown either in close formation and gradually thinned out, or are mixed with other species of different growth rates so that mutual improvement may be effected.

In early days of plenty in New Zealand only large size trees were used; now it is necessary to utilize every available stem; thus present-day foresters are faced with thousands of acres of worked-over bush in which the balance of growth has been destroyed, and which are vulnerable to fire, wind, and weeds, and which, if left untreated, will revert to uneconomic waste areas.

Conditions governing the extraction of timber, which safeguard the immature crop are now included in all the timber contracts on state forest areas.

Sentimental objections may be made to the introduction of exotic species into native forests, but this compromise is the only way in our present knowledge of preserving and bringing into economic production thousands of worked-over bush areas.

Changing Needs in New Zealand. Timber demands in New Zealand in the last twenty years have changed continually, and with the war-time prohibition of timber imports, utilization of New Zealand timbers has induced modification of forest treatment.

New Zealand timber trade started with the use of Kauri for ship-building, then came a period of waste and destruction and now again kauri is being used for war-time ship-building, in minesweepers.

Kahikatea was used and wasted in early days, then became the sole timber for butter-boxes, and now, with a restricted supply of this spedies, recourse has had to be made to the use of specially graded rimu timber.

Twenty years ago the use of beech timber was scarcely recognized, except for rough work; today Southland or Silver beech is proving a timber of all round use, to replace imported walnut and mahogany, in car, gun, and possibly aeroplane building, while a multitude of war-time containers are made from this timber. This extensive utilization makes economically possible the correct silvicultural treatment of these beech forests -- one of the major developments of New Zealand technical forestry.

The demand for rimu for war-time construction means a great decrease in wastage of inferior grades hitherto deemed worthless.

The growing of exotic forests in New Zealand, formerly viewed with suspicion, is now being justified by demands for war-time projects. Pinus radiata, which twenty years ago was little used now ranks third of all commercial timbers. It supplies all fruit casings and much temporary building material, and in addition large quantities are required for munition containers, and for concrete boxing.

Utilization of Waste. Restriction of paper imports has necessitated the use of suitable thinnings for rough types of paper and cardboard-making, and dangerous waste material is now consumed in the production of formerly imported fibre-boards and mill-board. Such utilization increases the management efficiency and hygiene of these forests.

A major problem for long has been the utilization of thinnings, which in larch plantations formerly gave a return too small to render the operation economical; however war-time use in tunnelling, trenching, and shelter building, and in power and communication lines now enables this process to be carried out on a financially sound basis.

Charcoal as a war-time commodity is being produced from waste material of beech milling and from manuka timber.

The trend of demand, therefore, is having a significant influence upon the use and treatment of our forest areas.

## IMPRESSIONS OF BUTTERFLY CREEK.

On November 29th three fortunate Bot. Soccers, undeterred by heavy rain at getting-up time, visited Butterfly Creek. The day was ideal. A fresh wind was a welcome spur up the shrubby hillside. Within the beech-forest, filmy ferns and bryophytes, refreshed by the rain, looked very different from the parched, curled and faded shadows of themselves which alone might have been seen in drier weather.

The trip was particularly satisfying for the orchid-lover. Ground orchids were first met with in the stunted wind-swept scrub -- two species of Thelymitra, one in flower, and a fruiting specimen of the dainty fairy Caladenia minor. In the beech-forest patches of Corysanthes triloba, some fruiting, were common. There was one small clump of Chiloglottis cornuta, with broad membranous leaves, characteristically two to a plant, and rather large green flowers. The leafless mottled flower-stalks of Gastrodia cunninghamii were found to be plentiful when once the eye had become used to discerning them in the shadows. A few of the large brownish-white flowers were fully open. This leafless orchid is a saprophyte, obtaining its organic nourishment from humus, with the aid of the fungus which inhabits its underground tubers, instead of elaborating it from carbon dioxide and water as do plants possessing green leaves.

In the swamp-forest on the level area between Butterfly Creek and Gollan's Stream, the broad-leaved epiphytic orchid, Sarcochilus adversus was seen in flower. Here also the ground was starred with shed corollas of putaputa (Carpodetus serratus). A strange and unknown shrub later proved to be Eugenia maire, that myrtaceous tree confined to swampy ground, from which it raises untidy masses of aerating roots.

On the way to the fire-place (where later billies, milk and sugar were found to be superabundent and tea by no means forgotten), the ground was strewn with pollen-cone clusters of matai, now brown and rain-sodden. Growth stages of another podocarp were also of much interest -- kahikatea seedlings a few months old, plentiful on several small patches of wet ground, suggesting that 1942 had been a good seed-year for this species, and that germination conditions had been favourable.

Beyond the fire-place, the undergrowth is a paradise of divaricating shrubs.

The homeward trip was made via the MacKenzie Track, where wood-rotting fungi of the shelf type abounded: tobacco-brown Polyporus tabacinus on a fallen log; Fomes hemitophrus, stout young specimens, still creamy-white over their whole surface, made a striking sight on the trunk of a dead standing tree, while an older specimen, on the under-surface of a log, was brown on top.

Tytranthe tetrapetala, a parasitic shrub closely allied to the English mistletoe, had dropped its slender scarlet petals on the track, and the plant, a mass of blossom, was soon found high up the trunk of a beech.

E.B. Ashcroft.

## THE MOSSES OF WATERFALL GULLY IN THE TARARUA FOOTHILLS, NEAR CARTERTON.

(This article relates to a field of New Zealand botany in which few records are available. A similar but more general paper "Mosses and their Habitats in the Atiamuri District, New Zealand" by Mr K.W. Allison, was published in 1931 in the Victorian Naturalist, presumably for want of a suitable journal in this country.

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