THE VEGETATION OF SWITZERLAND.

SUMMARY OF DR. MAYER'S TALK ON AUGUST 20TH, 1945.

Switzerland is associated in most people's minds with ideas of mountains and snow, but the Swiss "middle-land" with its gentler forms of rounded hills, forests, meadows, fields and orchards has no less appeal than the more austere mountainous region.

In the hilly part, the vine can be cultivated on sunny slopes. Next comes a belt of deciduous forest, above which is the conifer or subalpine zone that reaches to the upper limit of forest at an average height of about 5700 feet, though individual trees are found up to 6000 feet. The forest trees are:- oaks, in the warmest and driest areas; beech, in the middle-lands and lower mountain slopes with medium climatic conditions; fir (Abies alba), in the more humid parts of the beech zone and, where there is more rain and summer condensation of mist, forming a belt above the beech. Spruce occurs naturally in the mountains above the beech-fir level, or at lower altitudes where climatic or soil conditions are less favourable; but it avoids the definitely continental parts of the central alps where the Pinus cembra and the larch (Larix europea) take its place. Above the tree line follows the alpine region up to the limit of the never-melting snow. For the snow region itself 5 ferns and 258 flowering plants have been listed, and of the latter 9 climb to a height of 12,000 feet.

In Switzerland much attention is paid not only to the individual plants, but also to plant sociology, which is the study of plant communities formed as a result of the struggle for existence. Soil and vegetation are two systems influencing each other and both developing towards an equilibrium under the influence of climate. The fundamental unit of plant sociology is the plant association, which is defined as a plant community of definite floristic composition, or with a characteristic combination of species. This is a theoretical concept, most nearly realized in Nature by the "stand", which is a fairly uniform bit of vegetation.

To know an association well, one must study as many stands as possible. Lists are made of species growing in sample areas of suitable size. The analytical characters are found by analysing one stand, the synthetic ones by comparing the lists of different stands of one association. Quantitative characters are number and density of individuals; degree of cover i.e. the area covered by individuals of different species found by projecting their shoot systems on the ground; gregariousness, which is noted on a list from 1 - 5, from single individuals to great crowds. Examples of qualitative characters are position in regard to tree, shrub, herb, and moss layers; periodicity; vitality; for instance, during a transition stage in the succession from one association to another, a species may still occur, but its vitality is decreased and it does not grow well, nor does it reproduce. Of synthetic characters the chief is fidelity which means the degree of attachment of a species to a given community. The members of the three highest fidelity classes are the characteristic species which range from those that are found only in the particular community to those that grow predominantly and with best vitality in a certain community; the companions have no affinity for any special community; the accidentals are rare and accidental intruders from neighbouring or preceding communities. Defining the association by this Swiss system by its characteristic species is quite different from defining it by the most abundant or conspicuous species in the stand, as is usually done in New Zealand where we speak of kauri forest, rimu forest, rata forest, etc.

With the help of beautiful pictures Dr. Mayer described some truly alpine communities. Leaving the forest line, we first pass through an association of Pinus montana var. prostrata where the stems of those trees are prostrate on the ground. We notice a sweet scent and bending down find Daphne striata, only a few inches high, growing on calcareous soil. We notice also Clematis alpina, and at the same height we may come across one of the most beautiful sights of the alps - a large stand of Rhododendron, covering a slope with a red sheet. If we are on acid soil, we may meet another community of ericaceae, including a small woody plant, creeping over the ground and forming a carpet. It is the alpine azalea, Loiseleuria procumbens with small red flowers; a hardy plant which

stands up to frosts of -30° C., and strong storms. Also spreading in one plane above the ground is Dryas octopetala (Rosaceae) with shiny dark green leaves which show their silvery underside when the wind turns them over. The star-shaped flowers are silvery too, and so are the seed tufts. In the same place we find two species of willow which non-botanists would never suspect of being trees - Salix reticulata and S. retusa. Smaller still is Salix herbacea, which Linnaeus called the smallest tree on earth - it grows only 2 inches high.

On a dry sunny slope with calcareous soil and many boulders is a blue-grass pasture. The eye is captured by the variety of colours in many shapes of flowers, particularly leguminous plants, but also mauve alpine aster, the yellow Senecio Doronicum and various Pedicularis species. But the main purpose in coming here would be to pick some Edelweiss. You hear in the Alps, from time to time, of accidents occurring to people trying to get Edelweiss. The plant does grow in some very exposed places, but it must be admitted that Edelweiss can be seen growing on safe grassy slopes where it can be picked quite unheroically. In a nearby Sempervivum association grows the beautiful Anemone alpina var. sulfurea, and the lovely Gentians, which because they contain a bitter constituent unattractive to cattle, are rated as weeds.

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TITAHI BAY.

Early on the morning of December 1 a party of a dozen enthusiasts gathered on the Railway Station with the expressed intention of going to Titahi Bay and later to Mr. Graves' property on the shores of Porirua Harbour. The strong nor'wester blowing prompted the suggestion, to which we all agreed, to visit the bush at the back of the pa instead of going out to the coast. We followed up the valley a substantial pipeline which provides the Maori village with water. The first mile or more took us through a vegetation of mainly blackberry and gorse, where one member of the party recalled walking, about thirty years ago, through tall, standing timber. Small specimens of a wide variety of forest trees were noted in the remaining bush, but only one or two tall canopy trees were seen to be left in the valley. Broad cattle-tracks extended right through and frequent glades, grassed with exotics, showed how further destruction is proceeding. Unless some effort at conservation of this bush remnant is made soon, the continuance of the ruthless destruction so apparent, will make the area of little use for a source of water. On the other hand, if the bush is looked after it will supply continuously both timber and water.

Kaikomako flowering profusely everywhere was very conspicuous. We saw a number of Pterostylis Banksii flowering, several had pushed up boldly in the beaten mud of the track. Dainty plants of Asplenium Hookerianum with mature fronds three inches long were noticed twice on the way. A remnant of Tmesiptreis tannensis was seen on the base of a Cyathe a dealbata; this was high on an opened ridge so that more might be found in damper situations near the stream. A list of seventy odd species of native plants was compiled.

We followed the cattle track to the top of the ridge where the bush ended close below the highest part and open grassland rolled on towards the coast. At the bush margin many of the plants were strongly windshorn, the most striking being large plants, up to about twelve feet high, of kahikatea, with trunks four inches or more in diameter, bare for six to eight feet from the ground and carrying a dense, ball-like, divaricating head of the flexuous, juvenile form of branch, trimmed close to windward, but straggling loosely to leeward. Dr. Allan published in 'Ecology' in 1926 an account of such wind-produced growth forms in several species in a remnant of scrub closer to Titahi Bay. Although these forms are not often seen they may in fact mark a stage in the destruction of the forest, not only on the coast but also in windy mountain stations such as the Summit. The interest of this point alone warrants more investigation of this place.

The biting wind was so evident on the forest margin that the party was glad to retire to shelter. By the time lunch was unpacked a downpour had started. After we left the bush after lunch, we were exposed to wind and driving rain and a bedraggled and somewhat sorry party assembled on the road. We abandoned the idea of going on to Mr. Graves' place and tramped back to Porirua. We awaited four o'clock and bustime in a tearoom where Dr. Oliver, who lightly assured us he had been wetter, entertained us with stories about trips to different outlying islands.

Greta B. Cone.