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The author describes methods of avoiding the bad effects of over-grazing by rotational and deferred grazing. In this last method the stock are only allowed on the ground after the seed is set, and by working the seed into the soil actually secure better reproduction than if the range were protected from stock altogether. If an area has been so heavily over-grazed as to have reverted to the early weed stage, however, stock must be kept off it altogether till it has again progressed to the third or fourth stage and this takes many years.

Methods are described in detail by which a range can be used to the greatest economic advantage for grazing. Such scientific grazing methods could only have been elaborated after a thorough ecological study of the vegetation like that Mr Sampson has carried out.

A. G. T.

## NOTICES OF PUBLICATIONS ON FOREIGN VEGETATION

AUSTRALASIAN VEGETATION (C. E. FOWERAKER).

**Betts, M. Winifred.** "Notes on the Autecology of certain Plants of the Peridotite Belt, Nelson. Part I—Structure of some of the Plants (No. 1)." *Trans. New Zealand Institute*, **50**, 1917, pp. 230–243.

The Peridotite Belt or "Mineral Belt" is a boulder-strewn zone of about 29½ sq. miles in the neighbourhood of Nelson, South Island, New Zealand. Its vegetation differs strikingly from that of the surrounding country and comprises three principal plant associations:

1. SHRUBLAND, at the margin of the Belt, consisting of such shrubs as e.g. *Cassinia Vauvilliersii*, *Coprosma propinqua*, *Dracophyllum longifolium* and *Leptospermum scoparium*. These are of normal height, but there are trees, e.g. *Griselinia littoralis* and *Nothofagus fusca*, which are excessively dwarfed. A few herbs also occur.

2. OPEN SCRUBLAND consisting of e.g. *Cassinia Vauvilliersii*, *Dracophyllum rosmarinifolium*, *Exocarpus Bidwillii*, *Hymenanthera dentata*, spp. of *Veronica*, and numerous herbaceous species, e.g. *Notothlaspi*, *Gentiana*, *Anisotome*.

3. TUSsock GRASSLAND where *Danthonia Raoulii* is dominant and *Phormium Cookianum* and *Astelia montana* are sub-dominant.

In the paper under consideration the following species are dealt with: *Nothofagus fusca*, *N. Cliffortioides*, *Exocarpus Bidwillii*, *Muehlenbeckia axillaris*, *Claytonia australasica*, *Colobanthus quitensis*, *Clematis Colensoi*, *Notothlaspi australe*, *Weinmannia racemosa*. These spp. are treated under the headings of (a) Growth form (the usual growth form and Mineral Belt growth form are compared where necessary), (b) Anatomy of leaf and stem. Further papers are to follow and a summary of results will conclude the series.

**Collins, Marjorie Isabel.** "On the Leaf-Anatomy of *Scaevola crassifolia* with special reference to the Epidermal Secretion." *Proc. Linn. Soc. of New South Wales*, 1918, **43**, Part 2, May 29th, pp. 247–259.

*Scaevola crassifolia* forms a prominent element in the sand dune flora near Adelaide, Australia, where it is a low spreading shrub occupying large areas of the dune. The morphology of the shoot is described. The whole growing region of the shoot is covered with a sticky secretion which gradually dries up farther away from the stem apex giving the leaves a varnished or lacquered appearance. In their mature stage the leaves are thick and succulent and the secretion falls off.

The actively secreting glands are produced early in the development of the leaf. The secretion is abundant in the young leaf but ceases in older ones save at the leaf base where glands produce secretion which protects the axillary buds. The glands are really peltate glandular pairs which develop from epidermal cells. The secretion often reaches a thickness of  $76 \mu$ . In older leaves the glands cease secreting, the epidermal cells enlarge considerably, and the glands ultimately appear to be sunken between neighbouring epidermal cells.

Stomata continue to develop during the growth of the leaf, but the earlier formed stomata are rendered functionless for a time at least owing to the blocking of their pores with secretion. During the internal development of the leaf, differentiation of the tissues is delayed and occurs only when the secretion becomes less active. In mature leaves there is much water-storage tissue and water-storage tracheides. Numerous branched mucilage cells occur in the palisade region.

In conclusion the xerophytic nature of the plant and especially the leaves is dealt with and the thick secretion is shown to be a preventive of desiccation.

**Osborn, T. G. B.** "On the Habitat and Method of Occurrence in South Australia of Two Genera of Lycopods, hitherto unrecorded for the State." *Trans. Roy. Soc. of S. Australia*, **42**, 1918.

*Isoetes* and *Phylloglossum* were hitherto unrecorded in the South Australian flora. *Isoetes Drummondii* is recorded in this paper from several localities in S. Australia, where it is of interest because it is seldom submerged. In one locality submergence could not take place. The record of *Phylloglossum Drummondii* completes its range along Southern Australia. Only one locality is recorded for this plant: National Park, Belair. From three typical areas in this locality, 184 plants of *Phylloglossum* were obtained and a summary is given of the results of a comparative examination of their roots, leaves, tubers and cones.

"A description is given of the association in which *Isoetes* and *Phylloglossum* occur together. It is regarded as a seasonal swamp developed upon alluvial soil within the formation of sclerophyllous woodland. In South Australia both genera are members of a considerable geophilous element within this association" (summary).

**Hamilton, A. A.** "Topographical, Ecological and Taxonomic Notes on the Ocean Shoreline Vegetation of the Port Jackson District." *Journ. of Proc. Roy. Soc. of N. S. Wales*, **51**, pp. 287-355.

The floristic region described is in the Port Jackson district, east coast of Australia and runs coastally from Turrimetta Head to Port Hacking, stretching inland a few hundred yards from the Pacific Ocean. The region includes plant formations on strand, headland, sand-dune and hillside. Xerophytism is prevalent and the various xerophytic modifications are discussed; the principal factor affecting the vegetation is the on-shore wind. Many plants are aliens, having spread from ships' ballast dumped on the beach. The species occurring on strand, headland dune, etc., from Turrimetta Head to Port Hacking are set forth with ecological and taxonomic notes.

**Cockayne, L.** "Notes on New Zealand Floristic Botany, including Descriptions of New Species, etc., No. 2." *Trans. N. Z. Inst.* **49**, 1916, pp. 56-65.

The author continues his series of valuable notes on New Zealand Floristic Botany. The matter falls, for the most part, outside the scope of this JOURNAL, but in the latter portion of this part Cockayne discusses his "Proposed Botanical Districts of New Zealand." "...In the delimiting of a 'district' an attempt has been made to mark off *natural areas*