Several hundred single plants of the species *Medicago glutinosa* have been under observation. It is possible that from the best a satisfactory grazing type may be established.

*Mangels.*—A small area of a reselected line of Yellow Globe was grown to provide seed for increase and distribution under departmental supervision.

In a small trial last year, Kirsches Ideal, a recent introduction, proved to be somewhat lower in yield than Yellow Globe but to possess a much higher dry-matter content.

## BOTANY DIVISION, WELLINGTON.

Director: Dr. H. H. Allan.

Over one thousand specimens have been reported on from the usual sources, several new weeds being recorded, with special attention being given to weeds introduced through linen-flax seed. The herbarium of marine algæ has been considerably enlarged.

### Seaweed Utilization.

*Agar.*—About half a ton of dry *Pterocladia lucida* was purchased, chiefly from the Bay of Plenty, and about 100 lb. was processed by the Dominion Laboratory. The agar produced was submitted to local laboratories and to the High Commissioner in London. Reports show that the agar compared favourably bacteriologically, physically, and chemically with the best Japanese, and that there is a good demand both locally and overseas. Following these reports, and using data provided by this Division, arrangements are in hand to collect much larger quantities for commercial processing. Supplies come entirely from the North Island, and the beds can be harvested once a year.

*Carrageen.*—Certain species of *Gigartina* were recommended by this Division to take the place of imported carrageen, or Irish moss. As a result, more than 20 tons of dry *Gigartina* have been sold during the year from Stewart Island and the Southland coast for use in New Zealand. On experimental plots in Cook Strait it was found that this species can be harvested once annually without depleting the beds or diminishing the yield. Samples of New Zealand carrageen have been supplied on request to local firms for trial in pharmaceutical preparations and in the manufacture of tooth-paste.

*Potash.*—A paper, "Seaweed as a Source of Potash in New Zealand," prepared by A. M. Rapson (Marine Department), L. B. Moore (Botany Division), and I. L. Elliott (Department of Agriculture) for the *Journal of Science and Technology*, records the results of a quantitative survey of the chief kelp beds, with observations on the growth rate of *Macrocystis*. It is estimated that Cook Strait could yield annually about 4,000 tons of dry kelp containing approximately 1,000 tons of potassium chloride, and Foveaux Strait 1,200 and 300 tons respectively. It is estimated that 5,000 tons of dry *Macrocystis* should contain at least 5 tons of iodine.

*Sodium Alginate.*—American analyses show that dry *Macrocystis* contains some 16 per cent. of alginic acid. In view of the increasing interest in sodium alginate in Great Britain, arrangements have been made and material provided for a determination of the algin content of New Zealand kelp.

*Vitamins.*—References in the literature to the vitamin content of seaweeds have been reviewed for the Health Department, and supplies of promising kinds can be provided for assay if required.

### Medicinal Plants.

Four acres of experimental plots were laid down in the spring, and harvesting from most has been completed. The drier using hot-air circulation has proved very satisfactory.

*Atropa belladonna.*—Growth surpassed that obtained in 1940, and the leaf has been harvested. A good yield of root was obtained from two-year-old plants, and the root is under test.

*Datura stramonium.*—Growth was good, but no significant results were obtained from the different manurial treatments. A $\frac{1}{10}$ acre plot of a local type with upright growth and low seed yield gave 1,000 lb. of green leaf, as against 600 lb. to 700 lb. from the English type. A comparative test of the alkaloid content is being made.

*Hyoscyamus niger.*—Plots of both the annual and the biennial types were harvested for testing. Incidence of disease was decreased by sowing seed in the open, while root-rot trouble was largely eliminated by sowing on sandy, well-drained soil.

*Digitalis lanata.*—Further seed-supplies came to hand during the spring. Plants gave excellent growth and ample leaf obtained for testing. Seed has been saved, and selection work on this and other medicinal plants will be undertaken.

*Papaver somniferum.*—Plants of an Indian variety made poor growth, and bolted to flower, producing very small capsules. Seed of a Chinese variety, sown late in the spring, gave excellent growth with capsules of a good size. Preliminary tests indicate the material to be quite satisfactory.

Other medicinal plants are under smaller-scale trial, including *Ephedra*, *Barosma*, *Ricinus communis*, *Mentha piperita*, *Glycyrrhiza glabra*, *Chenopodium ambrosoides*, *Coriandrum sativum*, and *Fœniculum officinale*. The Division has supplied technical assistance to a commercial firm and to the Department of Agriculture in its work on medicinals on a commercial scale.

### Phormium.

Major trials laid down on the experimental area are—

*Spacing Trial.*—Using four varieties, to determine the most economic spacing for greatest yield, and the best spacing for growth and weed control.

*Season-of-cutting Trial.*—Over four seasons with four varieties, to determine effect on yield and recovery, with special reference to frost damage before, at, and after cutting.

*Cultivation Trial.*—Using various methods, to determine the effect on growth rate and yield, most economical practice, and best establishment of fans.

*Age-of-plant Trial.*—To determine seasonal and total yields and most efficient practice, and effect on quality of fibre.

Minor trials and investigations are in progress, including studies on water-table conditions, nursery methods, and soil conditions.