

recovery of uranium the work of the dredges would have to be slowed down and the output of gold thus reduced. Consequently, effort has been devoted to new and important methods of separation of the heavy minerals from such tailings and from certain sands.

An officer of this Section has spent some considerable time in Australia studying methods of flotation and separation of heavy minerals, and, as a result of this and also of other investigations elsewhere, equipment is in process of assembly so that such separation can be carried out more efficiently. It seems reasonably hopeful that small-scale production could, if necessary, be carried out in future.

Equipment.—During the year a number of light portable gamma-ray counters were produced. Laboratory-type counters were constructed and work commenced on beta-ray counters. Equipment was made available to outside laboratories for biological and chemical research and for geophysical prospecting.

Geological and Mineralogical Work.—Routine work continued on the testing of samples selected by members of the Section and those sent in by the Geological Survey, other Departments, and members of the public. Valuable experience was gained in bore-logging by radioactive methods. These appear to have special usefulness also in coal-seam estimations, since coal is in general very inactive compared with surrounding strata. Considerable work has been done on chemical methods of estimation of uranium and thorium.

PLANT CHEMISTRY LABORATORY

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Chemical Laboratory at Agronomy Division, Lincoln.—In order to extend to forage crops the work which is being done on pasture plants at Palmerston North, a laboratory is being established at the Agronomy Division, Plant Research Bureau.

Vitamin Analyses.—Due to alterations in the Food and Drugs Act, which now requires that any product which is advertised as containing one or more vitamins must have the minimum vitamins content quoted on the label, various commercial firms have asked for analyses of the B group vitamins. A survey of the vitamin B content of various cuts of meat has also been made at the request of the Food Committee with results which are in substantial agreement with those reported from other countries. The survey emphasizes the high content of thiamine, riboflavin, and nicotinic acid in liver and kidney.

The technique for microbiological assays has been greatly simplified by the introduction of freeze-dried cultures and media. Continuous subculturing of the organisms with its attendant difficulties is no longer necessary, while sufficient media for a year's analyses can be prepared in one operation.

Pasture Growth Studies.—In collaboration with Grasslands Division, studies of the factors influencing pasture-production are being continued. One phase of this work started from the observation that no synthetic mixture of fertilizers gives yields of herbage comparable with those obtained from the droppings of grazing animals. Since it has been established that herbivorous urine contains considerable concentrations of plant hormones, an investigation of the effect of these materials on fertility and the growth of pasture plants is in progress. The nitrogen cycle in pasture is also being investigated on a collaborative basis in order to delineate more clearly the effect of clovers and of the grazing animal, and to determine the place of artificial nitrogenous fertilizers in grasslands management.

Hormone Weed-killers.—A successful trial of these new weedicides has been conducted in Ashburton County on a cocksfoot crop which was badly infested with nodding thistle. Control of the weed by both dusts and spray was entirely satisfactory.

Trials have also been carried out which demonstrate the extreme care which must be observed in washing the last traces of these weed-killers from spraying equipment before using them for other purposes. Failure to take these precautions has already resulted in serious loss among susceptible plants.