

NUCLEAR PHYSICS SECTION

Radioactive Mineral Resources.—No further reconnaissance survey work for radioactive minerals was done during the year, sufficient data having been assembled to indicate the supply and distribution of our natural resources, which are of too low a grade to warrant immediate exploitation for these minerals alone. Some further work was done on the heavy mineral concentrates from dredges, and it was shown that at present market values it would not be economic to separate the radioactive minerals.

Equipment.—Some further developmental work was done on new types of beta-ray counters. Technical assistance and equipment were made available for tracer-element studies in biological and agricultural research, and field equipment was also used in geophysical prospecting.

PLANT CHEMISTRY LABORATORY

Pasture Growth Studies.—Collaborative work with the Grasslands Division on the factors which influence pasture-production is continuing. There are two phases of the investigation which are of particular interest to this Laboratory :—

(a) *The Effect of Animal Excreta in Soil.*—Quantitatively and qualitatively the manurial effect of the grazing animal on high-production pasture is more important than manure from any other source. A study is being made of the nitrogenous materials in herbivorous urine, their fate in the soil, and their effect on nitrification. It is already indicated that the accepted concept whereby nitrogenous materials are converted by micro-organisms through ammonia to nitrate is an oversimplification.

(b) *Growth of Plants under Controlled Environmental Conditions.*—The first stage of this project, which is an attempt to sort out the many factors contributing to the growth of pasture plants alone and in association, is proceeding satisfactorily.

Forage Crops.—Although the branch laboratory at the Agronomy Division is not ready for occupation, some analyses on various forage crops have been carried out.

Apple Dehydration.—Much work has been done on the problem of storage of dehydrated apples, and recommendations have been made as to the level of sulphur dioxide required by different varieties, the keeping-qualities and hence the order of marketing of different varieties, and the grade of cellophane to be used for packaging.

Hormone Weed-killers.—The serious problem of washing spray equipment free of these compounds has been solved, although unsatisfactorily to the commercial user. With all preparations very thorough washing is required, while with oil-based materials special treatments have to be applied.

Antibiotics.—All fabrication work on the pilot-scale equipment has been completed. The unit should be in operation by May, 1948.

Metabolism of Green Leaves.—This long-term investigation, which is complementary to the studies on pasture growth, has been vigorously prosecuted during the year. It has been established that the anomalous results reported in last year's report are due to urea and urea compounds, which are of particular importance during periods of active growth.