

MINERAL CONTENT OF PASTURES.

Unfortunately, the research work in this connection has been seriously curtailed owing to cessation of the Empire Marketing Board grant, but it has been possible for the Cawthron Institute to continue investigations dealing with iron metabolism and its relation to deficiency diseases of the bush-sickness type. Simultaneously, it has also been possible at the Plant Research Station to continue work on the varying mineral content of pastures at all seasons of the year, and any modifications therein which may be induced by manurial or other treatments.

Apart from the general work on pastures showing deficiency of lime and phosphates, there are areas where unthriftiness of sheep appears to be connected with deficiencies of elements normally present in minute quantity. In these cases, treatment by drenching with soil from certain "healthy" areas has shown astonishingly beneficial results. Apart from the results in the case of bush sickness, this has been well exemplified by work at Morton Mains in Southland, and, as in the case of bush sickness, there is evidence that the fundamental factor is the geological origin of the soil. This interesting study will be continued during the coming year. A donation from the Southland Frozen Meat Co. towards the work is gratefully acknowledged.

Some work has been carried out on the efficacy of different types of limonite for treatment of bush sickness and the causes of the different results attending the use of various forms of this iron compound. The problem is not yet solved, however.

PHORMIUM TENAX.

The nursery areas at Massey College have continued to be used for the selection, breeding, and propagation of strains of phormium. With the likelihood of there being a specialized demand for fibre suitable for fabric purposes, now that the manufacture of wool-packs has been commenced, attention is being devoted to the qualities of strains of phormium for this purpose, while, for cordage purposes, several outstanding varieties have been fully tried out, and certain of these have been supplied for field propagation. The possibility of the utilization of phormium as a source of cellulose has been the subject of considerable investigation, both in New Zealand and overseas, and it is hoped that the work will be completed during the coming year.

WHEAT RESEARCH INSTITUTE.

This research activity has exemplified well the value of scientific co-operation with the three sections of the wheat industry. A new wheat, Cross 7, has been brought to the stage of commercial exploitation, and, after exhaustive trials, has shown a high per-acre yield capacity, and an increased yield of flour associated with a definitely higher baking-quality. Further testing and selection has enabled some of the less desirable varieties of wheat to be eliminated and replaced by varieties of better quality. The research experience gained in previous years has now made it possible to give guidance to matters which help to overcome the difficulties associated with the gristing of wheat harvested in difficult conditions. Bakers have had a number of their own specific problems dealt with, while the incidence of the whole research, carried out as it has been with the fullest co-ordination through all stages from the sowing of the seed to the baking of the bread, has resulted in a standardized product of more even and higher quality than would otherwise have been possible.

KAURI-GUM.

Continued investigations of kauri-gum, both that extracted from swamp material and from wood, have shown that this material is capable of being refined, and so improved in colour as to be used in the production of high-grade varnishes and lacquers. The results of these researches now await more large-scale development on a commercial scale.

PLANT RESEARCH STATION.

Research work at this Station has been directed towards all phases of plant growth, as these concern the farmer. Much emphasis continues to be laid upon strain influences as they occur both in pasture grasses and clovers, and in the range of agricultural crops. The influence of manurial applications on the yield of crops, the measures whereby the maximum returns can be secured from expenditure on fertilizers, is still being subjected to constant investigation. Plant-diseases, as occasioned by insects, fungi, bacteria, and virus, have been subjected to steady research, and a fair measure of success has attended many of the efforts devised to control the losses occasioned by these pests. The Station is so organized that it can readily deal both with fundamental research and with its testing-out in agricultural practice. Much of the valuable applied work now in operation—*e.g.*, seed certification, standardization of sprays—owes its value to the fundamental researches which have preceded it at the Station, which is, moreover, also in a position to maintain a constant check upon all such applied activities.