

then have done well, while still on the mothers, but eating grass freely, become low-conditioned, constipated, anæmic, dull, and lustreless in the wool. Deaths occur rapidly and in large numbers. Ewes and even wethers sicken in some seasons.

Various licks have been tried, so far without result, but as this disease may be due in part to an inadequate supply of iron in the herbage, the limonite and salt lick is being given a careful trial. The pasture analyses so far completed have shown no deficiency of any of the usual mineral constituents, phosphate and lime in particular being present in adequate amount. Iron has been low in the uncontaminated samples. Analyses of ewes' milk and of bones from sick lambs have been made, but although the bones were apparently somewhat abnormal, interpretation of the results must be deferred until a sufficient number of bones of normal lambs of the same age have been analysed for comparison.

A somewhat similar trouble in calves on new, bush-burn, peaty soil, near Riverton is undoubtedly due to iron deficiency, and has been cured by the administration of iron ammonium citrate.

#### MERCURY ISLAND (GREYWAKE LOAM).

Some samples of pasture and soil were analysed from Mercury Island, as the owner reported poor response to top-dressing and mortality among his sheep. Pasture analysis showed low iron lime, and phosphorus, and high magnesium, while the shortage of rainfall on the island is probably the cause of the poor response to top-dressing. The use of a bone-meal, salt, and molasses lick was recommended, and the use of superphosphate in the drinking-water.

#### BOVINE ECLAMPSIA IN THE WAIKATO DISTRICT (VOLCANIC SEDIMENT LOAM).

In the early spring a number of pasture-samples were collected from affected and unaffected farms in connection with the veterinary investigation of this trouble. As it was thought that excessive amounts of nitrates or nitrites in young pasture might be a predisposing factor, nitrates were estimated in a number of the samples. Although appreciable quantities of nitrates were present, there was little distinction in this respect between affected and unaffected pastures.

#### MISCELLANEOUS.

A case of extensive bone-chewing and falling-off of milk-yield in a North Taranaki dairy herd was shown to be due to overstocking during a seasonal drought. Pasture and soil analyses undertaken later following heavy rain, when the bone-chewing had ceased, showed no deficiency of phosphate. Superphosphate in the drinking-water is indicated as the remedy in such cases.

A severe illness in a dairy herd near a superphosphate works was traced to the condensation of fumes containing fluorine, on the pasture. The symptoms were loss of condition, cessation of milk-supply and rumination, dull coat and eye, and rapid weakening. The cause of the liberation of so much fluorine was the substitution of North African rock-phosphate for Nauru Island phosphate, the former being much richer in this element.

Some flax strippings analysed to determine their value as supplementary stock-food, contained only 5.95 per cent. of protein in the dry matter, and this material is therefore unlikely to be of use in this direction.

#### IODINE DEFICIENCY.

The main work during the year has been the mapping out of iodine-deficient areas in New Zealand, by the amounts of iodine found in the thyroid glands of sheep and lambs bred in definite districts, and the attempts to determine whether there is any correlation between the amounts of iodine found in the glands of animals bred on similar soil types in different districts. Veterinarians and Meat and Stock Inspectors have obtained glands from animals of known history, and from this source during 1931-32 about 350 samples have been received, many containing twenty or more glands. These have been dissected and digested and are in course of analysis.

Glands are sometimes received which are mutilated, or have small parts missing. About forty analyses were made from carefully dissected glands, cut into small pieces, to see whether there was a significant difference in the percentage of iodine occurring in various parts of the gland. On the whole, the percentage of iodine in the isthmus is smaller than that of the lobes through which the iodine is fairly evenly distributed, but the weight of the isthmus is so small compared with that of the whole gland that its rather lower iodine value makes no difference in the total percentage. Hence it was concluded that glands which had had the isthmus or a small portion of the lobe lost in dissection would still show a reliable percentage of iodine.

In *Chemistry and Industry*, Volume 51, No. 7, for the 12th February, 1932, reference is made to the discovery at Budapest of a method for administering iodine so as to avoid after-effects. Iodine is fed to poultry which lay eggs each of which contains 0.169 mg. of iodine. Apparently the fact has been overlooked that this method was investigated and reported on by Miss B. W. Simpson of the Rowett Institute, while on loan to this Department, in the *New Zealand Journal of Agriculture* for June, 1930 (Volume XL, No. 6, p. 403). Miss Simpson reported that eggs from hens fed with from 2 to 4 mg. potassium iodide per day contained from 0.213 mg. to 0.568 mg. iodine each.

*Rabbit Experiments.*—Experiments on rabbits are being carried out to find minerals which affect iodine metabolism in such a way as to produce goitre. About twenty glands from both young and mature animals have been analysed, and in many cases the iodine content was well below normal, although the glands were not enlarged. Results indicate that if the animal is not receiving sufficient iodine (due either to an iodine-deficient diet, or the presence of minerals exercising a possible depressing effect) in its daily intake, the total amount of iodine in the thyroid tends to be depleted. Further work is being carried out to see whether enlarged glands result after one or more generations.

*Blood Experiment.*—An experiment was carried out on cows at Wallaceville to find whether an indication as to the amount of iodine a cow was receiving through iodized licks would be given by a blood analysis. About 130 blood samples were analysed, and results clearly showed that the amount of iodine in the blood was dependent on the quantity fed, and the time which elapsed between dosing