

Bone-nutrition troubles in sheep have been reported from Pongaroa, Horoeka, and Pahiatua soils on hilly country. All of these soils show an unbalanced lime-magnesia ratio. There was in some cases twice as much magnesia as lime. The general indication in all these cases is to lime heavily, but it is extremely desirable that the matter should be more closely investigated by means of field experiments. A further complaint of sickly hoggets at Kaitawa is being investigated.

Some field experiments with sheep have been initiated at Glenhope, Nelson, on an area of land on which a deficiency disease develops, and interesting results may be expected in due course.

#### *Bush Sickness.*

The chemistry work in connection with bush sickness has been continued in the experimental manufacture of licks of various composition in brick form, and the administration of organic iron drenches. The installation of the brickmaking plant at the Wallaceville Laboratory has proved a success from the first, the advantages not only being that the composition of all the bricks is absolutely controlled by departmental officers, but there is no tiresome and often dangerous delay in executing orders, and the cost of the brick is considerably reduced.

The drenching of stock with syrup of phosphate of iron, hitherto the only known medicinal cure for bush sickness, has been further supplemented by the knowledge that double citrate of iron and ammonium is equally efficacious and, moreover, quicker in its action. An article was written jointly with the Director-General on the subject for the *Journal* (April, 1919, issue), entitled "Curative Treatment of Bush Sickness by Iron-salts." At a critical time in the experiments the influenza epidemic visited this country and disorganized the work at the farm, hindering the experimental work.

#### METHODS FOR EXTERMINATING RABBITS.

The various methods for exterminating rabbits have been reviewed during the year, and the supply of suitable poison is still the subject of investigation. The difficulty of obtaining supplies of poison has been accentuated by the disorganization of the shipping trade between Australia and New Zealand, and the fact that one poison—carbon bisulphide—is an undesirable cargo.

#### MORTALITY IN STOCK DUE TO POISON.

Mortality in stock due to poison occurs with the usual frequency. The evidence in one case in which sheep were concerned threw strong suspicion on the dipping-composition used, but the specimens sent were too fragmentary to enable any satisfactory decision to be reached. In two other cases arsenic and lead were respectively isolated, and the mortality was referable to carelessness in leaving substances containing these poisons within the reach of stock. Lead paint is, however, such a universally used preservative that the most careful pains should be taken by farmers to guard stock from it and from substances painted with it.

#### POISONOUS PLANTS.

A series of articles on poisonous plants has been commenced in the *Journal* (June and July, 1918). In this series it is hoped to refer to all the known poisonous or medicinal plants of the Dominion.

#### DAIRY-INDUSTRY WORK.

Twenty-one samples of butter intended for export were examined for the Dairy Division. Of these, nineteen were found to contain more than the legal quantity of water (16 per cent.), and the export of butter containing more than this amount thus prevented.

The analysis of potable waters for dairy factories has been continued. Samples of preservatives for the Dairy Division have also been analysed. The supply of colouring-matter from anatto-seeds has been looked into. The anatto of commerce used for colouring cheese is derived from the pulpy matter (the arils) surrounding the seeds of a lilaceous plant (*Bixa orellana*). Anatto is one of the few dyes which will dye vegetable fabrics directly—that is, without the use of a mordant. There was probably a great demand for anatto during the war, which would leave a surplus on the market of the seeds containing a very small proportion of the colouring-matter on the cuticle.

#### WORK FOR HORTICULTURE DIVISION.

The analysis of spraying-compounds has been continued.

Experiments have been conducted with thick honey, which is produced from manuka and other plants in quantity, and which cannot be extracted from the comb by the ordinary centrifugal methods. A method was devised in the laboratory of successfully filtering this honey, but opportunity has been lacking of testing the method on a factory scale.

A report has been made at the request of the Board of Agriculture on the soil of the Tauranga Horticultural Station (M/246 and J/58). Samples of wine have been analysed to determine the amount of tartar which could be obtained as a by-product in the manufacture. It was found that the quantity produced would be too small to profitably recover, thus bearing out the previous annual report.

#### ADVISORY WORK.

The abolition of the Fields Division of the Department and the distribution of the work previously administered by that Division has thrown a share of additional work on to this Section. A course of lectures on chemistry was given to the student assistants at Weraroa. The field experi-