

*Curative Treatment with Iron Medicines.*

During the year a large amount of ferric ammonium citrate (some 13 cwt., an amount equivalent to 18,600 cattle doses) has been sold in 1 lb. lots to farmers in the pumice lands affected with bush sickness. Farmers, as a rule, do not readily commit their thoughts and experience to paper, but those who have replied to the circular asking for their opinion have generally given replies very favourable to the use of the drug. The area over which these farmers are working is a very wide one, extending on the coast from the Bay of Plenty in the north to Whakatane in the south, and inland to Putaruru. Some of the farmers have been using the drug for several years (one for seven), so that this method of combating the bush sickness bids fair to become a recognized practice in the agriculture of the pumice lands. The remarkable fact to be noted is that the use of the iron ammonium citrate is increasing more in the border-line farms which are not recognized as having more than a slight tendency towards the malnutrition in the cows. It is becoming recognized that the iron treatment increases the yield of milk and enables the cow to rear healthy offspring under conditions which previously resulted in failure.

The treatment of cattle for bush sickness appears to be an easy matter compared with treatment of sheep. For these animals the pellet method had given a striking success in two experiments, in each of which a small flock of sheep were used. This method involves the use of the deficient mineral mixed with about 50 per cent. of oily meals, and the mixture made into small cubical pellets and baked to a dry hard state. It is hoped shortly to arrange for a large-scale experiment with sheep.

*A New Cure for Bush Sickness.*

Seeking for a form of iron which would have all the advantages of the double citrate and none of its disadvantages, experiments have been made with a native carbonate of iron (spathic iron, or "siderite" of the mineralogists) which was obtained from a quarry near Auckland. This has the advantage that it is insoluble and not likely to have such ill effects on the animal when taken in excess. The difficulty was to grind the singularly hard, tough boulders into a very fine powder. This was eventually accomplished with the aid of a paint-manufacturers' mill (by the kindness of Jackson and Co., Wellington) on a small scale, and, finally, by the phosphate-mill of the Challenge Phosphate Co., Auckland, on a much larger scale. To both of these firms the Department is much indebted and tender them hearty thanks. A farmer then tried the material mixed with common salt in the bails of three bush-sick cows, which recovered under the treatment. He then tried it on the herd in the field, and found that all (a majority of the herd) those which would take the lick improved under the treatment compared with those few which refused to take it. The experiments are accordingly being extended.

*"Dopiness," or Calcium Starvation, in Sheep.*

A type of air-borne volcanic soil differing greatly in response to fertilizers and in agricultural value from the coarser pumiceous sandy and sandy-silt soils of the central district of the North Island is the volcanic andesitic loam of what is known as the King-country. This loam has been derived by weathering from showers of fine volcanic dust or mud, and is described by Henderson and Ongley (Bull. Geol. Survey, No. 24, p. 56). The analytical examination of this type of soil and of the pasture growing upon it has been the subject of recent investigation. In August, 1926, the writer was first consulted regarding a loam soil which, with its subsoil, showed a very characteristic section in the road-cuttings—a brown loamy face which cracks up in summer, then appearing as a much-fissured surface exactly similar to that described by Henderson and Ongley.

This type is abundantly distributed in the Mairoa Riding of Waitomo County, about 15 miles west of Te Kuiti, at an elevation of about 1,000 ft. above sea-level. The local rainfall is a heavy and well-distributed one; the surface features show what the farmer would call "easy country"; and the native vegetation originally consisted of forest and shrubs of a type which might be called mixed rimu-tawa forest, which indicates good soil rather than bad. On many farms the forest had been burnt off over twenty years previously, and, generally speaking, the whole area consisted of surface-sown pasture, a good deal of which had reverted to fern and second growth. Where the pasture was still maintained it had reverted from the ordinary grasses sown on the burn, including rye-grass, cocksfoot, and clovers, to *Danthonia*, Yorkshire fog, and brown-top. The complaint one had to investigate was not so much the fact of decreased carrying-capacity of pastures which had for their first seven or eight years after the burn carried one and a half ewes to the acre, and now carried only less than one dry sheep, but that even with that diminished stocking the animals did not thrive, and the number of culls in the flock greatly diminished or altogether extinguished the profit. There was very little cultivation practised, and club-root (finger-and-toe) disease in cruciferous crops grown in field or garden was alleged to be an invariable occurrence.

Dr. J. B. Orr, Director of the Rowett Research Institute, visited this area when on his visit to New Zealand in August, 1928, and approved of experiments being conducted to determine the cause and remedy of this form of malnutrition. A certain amount of progress had been made at the time of Dr. Orr's visit, indicating that the deficient element responsible was calcium. The reasons which led the writer to the adoption of this hypothesis may briefly be mentioned:—

- (1) Excessively high "lime requirement" figure of the soils.
- (2) Non success with phosphates in eliminating the disease.
- (3) Presence of club-root in cruciferous crops.
- (4) Excessive moss in the pasture in winter seen in top-dressed land.
- (5) Absence of clovers and other Leguminosæ in the pastures.