

CHEMISTRY SECTION.

REPORT OF B. C. ASTON, F.I.C., F.C.S., CHEMIST.

BUSH SICKNESS (IRON-HUNGER) IN RUMINANT STOCK.

In order that the soil survey and the collection of pasture-samples might be pushed forward, it was decided to station an expert officer at Rotorua, and in June, Mr. R. E. R. Grimmett, M.Sc., took up his residence there. He was systematically employed in carrying on the above work until the end of April, when he was seconded to the Rowett Institute, under the Imperial Marketing Board's scheme of mineral content of pasture-investigation, for six months' training. A local farmer, Mr. E. H. Brain, of Kaharoa, has been temporarily appointed to assist in the work during Mr. Grimmett's absence.

A number of field experiments using iron compounds for top-dressing permanent pasture were inaugurated by Mr. Grimmett, and in this way 10 tons of sulphate of iron have been distributed to farmers in the affected districts to be used in co-operative experiment investigations with superphosphate, the farmers supplying the cattle themselves.

The use of iron ammonium citrate has considerably increased; the action of the Department in supplying this drug to farmers at cost price has, judging from the sales, been much appreciated. Over a ton of this drug has been sold to farmers in small parcels of a pound or so at a time. Some farmers, however, who did not adhere to the instructions, could not obtain the desired results. The authoritative method of dealing with the trouble was therefore summarized and published in the *Journal* for August, 1926, page 98.

In order to learn whether a geological examination by an expert in land-forms would be of any value, an arrangement was made with Professor Cotton, the well-known New Zealand geomorphologist, to visit the district and report upon it. Dr. Cotton has not yet concluded his investigations, but his visit has been of considerable service to Mr. Grimmett, who has published in the *New Zealand Journal of Agriculture* for May, 1927 (page 289), a paper showing how the physical features of typical bush-sick country differ from those of typical healthy country.

During the year lectures to farmers have been given by members of the chemical staff to audiences of farmers at Tokoroa, Welcome Bay, Tauranga, Omanawa Falls, Kaharoa, and an interesting evening was spent at the Agricultural Science Club at Auckland University, when the subject of iron-starvation and the utilization of pumice lands was the subject of discussion by experts.

SOIL SURVEY.

The soil survey of Rotorua County has been continued during the year, over 400 further samples having been collected and analysed. The provisional soil map referred to in my last report has been completed, and was published in the *Journal* for June, 1926. Sufficient data have now been obtained for the preparation of a soil map of the southern portion of the county, which it is hoped will be published shortly. A subsoil map of the Rotorua County (northern portion) has also been completed. A paper on the importance of texture in soils, with special reference to the Rotorua coarse soils, was published in the *Journal* for July, 1926.

Soils of the deteriorated hill country of the Stratford-Whangamomona district have been the subject of inquiry, and some samples have already been taken. It is proposed to extend the work during the coming summer.

A soil from Canterbury which was treated with an arsenical weed-killer sixteen years ago, and is still sterile for most crops, was found on analysis to contain 0.05 per cent. of arsenious oxide (As_2O_3) in the topsoil. The matter is being further investigated.

At the request of the Tahiti Administration, through the Consul for France, Wellington, the analysis of a number of soils from Tahiti was undertaken, and a report supplied.

Other soil-work included the testing of soils for lime requirement for Fields Division officers, and examination of soils for the State Forest Service.

FERTILIZERS.

No official samples were submitted by Inspectors under the Fertilizers Act during the year, but twenty unofficial samples were received from officers of the Department, and twenty-four samples were sent in by purchasers for comparison with the invoice-certificates.

The quality of the basic slag imported into New Zealand has received attention. It was not found that any low-grade slag was being offered, but in certain instances slag that was distributed direct to the consumer from the ship's side was found to be below the manufacturers' guaranteed analysis, and a suggestion by this Section that imported basic slag should be examined before shipment to New Zealand has been adopted. Arrangements have now been made whereby slag exported to New Zealand from British and Continental ports will be sampled and analysed in England by the