

CHEMISTRY SECTION.

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There has been a notable increase in the work of the Chemistry Section during the year. The number of samples received was 2,039, compared with 1,276 in the previous year. In order to deal with the increased work, additional assistance, both in the laboratory and in the field, has been secured, and two additional rooms in the Medical Stores building, Sydney Street, have been fitted up for pasture-analysis work.

MINERAL CONTENT OF PASTURES.

The principal work of this Section has been the continuation of the investigation into the mineral content of New Zealand pastures, as outlined in previous reports. In addition to the work under the Empire Marketing Board's scheme of research, other lines of investigation are being carried out in co-operation with the officers of the Live-stock Division, including the relation of pasture-composition to incidence of temporary sterility in dairy cattle, and to the occurrence of "pulpy kidney" in lambs in Central Otago.

Rotorua Pumice Lands.—The work in this area has consisted of the extension of the soil survey with the object of delimiting the various soil-types; and experiments in the medicinal treatment of animals, and top-dressing of pastures. A grass garden has been established on the typical coarse pumice soil at Kaharoa, with the object of studying the composition of the different species under known conditions of growth. Experiments in the chemical control of ragwort have been carried out, a report on this work being published in the *Journal* for December, 1929. The extent to which phosphates are leached out of these coarse pumice soils is being investigated. So far it does not appear that there is any material loss of phosphates in the soil drainage water.

Waitomo County.—The investigation of the malnutrition troubles in sheep at Mairoa and at Kopaki has been continued, and further samples of soil and pasture have been analysed. A report on the progress of the top-dressing experiments at Mairoa appeared in the *Journal* for April, 1929.

Poverty Bay.—The occurrence of malnutrition troubles in sheep on certain Poverty Bay back-country pastures has received further attention. Additional samples have been obtained, and the results of analysis show some evidence of correlation between the iron content of the pasture and the health of the stock pastured thereon. A large-scale manurial trial with phosphates is now in progress on this country to determine whether the sheep will still go sick on the top-dressed pasture, as on "bush sick" country.

Wairarapa.—In connection with the occurrence of eclampsia and temporary sterility in parts of the Wairarapa district, the collection and analysis of soils and pastures have been continued, and a progress report was published in the *Journal* for August, 1929. The results confirm the observation made in my previous report—viz., that the poorer pastures of this district are among the lowest in phosphorus-content that have been met with in the course of the pasture research.

Taranaki and Waikato.—In co-operation with officers of the Veterinary Division, an investigation of the composition of pastures where temporary sterility in dairy cattle occurs has been carried out during the year. So far no definite correlation between mineral content of pasture and incidence of disease has been detected, but the work is being carried on and will, in any case, furnish useful data regarding the composition of typical dairying-pastures.

Medicinal Treatment.—The administration of supplementary rations to animals on mineral-deficient areas by means of licks or feeding pellets containing the necessary mineral elements has met with an encouraging measure of success. The use of the double citrate of iron and ammonium in the treatment of cattle on the iron-deficient pumice areas is now an established farming practice, and some 1½ tons of this preparation were imported during the year and sold in small lots at cost price to farmers on affected country. The administration of this remedy to sheep in the form of pellets or cubes containing meals has been attended with success at Mamaku. Here a small flock that was showing signs of bush sickness after twelve months' grazing on unimproved paddocks heavily top-dressed with phosphates was made healthy and kept in good health for another year, and finally sold fat, as the result of the administration of the citrate in pellet form. The best means of accustoming sheep to accept this treatment is still a matter of experiment, but it is anticipated that the difficulties that have been encountered will shortly be overcome.

The experimental use of spathic iron ore (ferrous carbonate) and salt as a lick on iron-deficient country has been extended, and some very encouraging reports have been received regarding its efficacy. The trials are being continued.

Ragwort.—A small experiment at Kaharoa in the treatment of ragwort with sulphate of iron and salt was so successful that it was decided to carry out a more extensive experiment at Mamaku farm and in other ragwort infested districts. A further series of tests was carried out at Mamaku, using sodium chlorate, bleaching-powder, and copper sulphate, in addition to the iron-sulphate-salt mixture (this time applied as a spray). The treatment was applied in February; at the end of March it was reported that the sodium chlorate had been entirely effective, the patch sprayed being as green as before treatment, while no living ragwort-plants could be found. The iron-sulphate-sodium chloride mixture also gave good results.