

Hawke's Bay, notably from Wanstead (91 per cent.) and Dannevirke (87 and 96 per cent.). That such material is available to the farmer without the expense of erecting costly grinding plants is extremely satisfactory, and no doubt many other localities in Hawke's Bay and the Wairarapa could be served with similar cheaply produced material. It is satisfactory to notice that the utilization of soft calcareous deposits, first recommended by this Section of the Department, is gaining ground, seeing that such material gives practically as good results in field trials as the manufactured article.

Toxicological.—A number of poisoning cases in domestic stock have been submitted for investigation. Lead poisoning in cattle was established in a case at Wanganui. Poisoning of pigs fed on refuse containing salt was suspected in two cases. Plant poisons continue to claim victims. Introduced buttercups (*Ranunculus*) are again objects of suspicion. Two cases afforded instances of *Ranunculus parviflorus* seeds being found in the stomachs of poisoned animals with characteristic symptoms of buttercup poisoning. In one of these cases *R. scleratus* was also suspected. These are both naturalized plants. In native plants *Hydrocotyle asiatica* (Asiatic pennywort) has been strongly suspected of poisoning sheep, while *Lobelia anceps* (native lobelia) is also under some suspicion. These matters will be thoroughly investigated as opportunity offers.

Fertilizers.—Phosphate rock in New Zealand: A new locality for the occurrence of phosphate rock in New Zealand apparently exists in the North Auckland District. Mr. H. Parsons, of Rawene, forwarded to the Laboratory in May, 1922, a specimen of rock which contained 11·12 per cent. phosphoric acid, equal to 24·4 per cent. tricalcic phosphate. A specimen of greensand received from Mr. L. W. Kempthorne, of St. Andrew's, near Timaru, was found to contain 4·1 per cent. phosphoric acid, equal to 8·95 per cent. tricalcic phosphate. Spent oxide from gasworks: An inquiry regarding the spent iron oxide from gasworks reminds one that this material, which can usually be had for the cartage, is rich in sulphur and also in nitrogenous compounds, which when allowed to oxidize on the surface of the pasture are transferred into useful nitrogenous fertilizers. The sulphur is also of value on some soils.

Fertilizers Act.—Forty-six samples have been examined, as against thirty for the previous year. Of these, one sample was found to be seriously below the vendor's guarantee, the deficiency in water-soluble phosphoric anhydride being equivalent in value to about £2 per ton. In this case suitable action was taken. Of the samples received, seventeen were from the Auckland District, fourteen from Wellington, and fifteen from Taranaki. The Inspectors in Agriculture and other officers of the Department forwarded sixty-seven samples of fertilizers for analysis, mostly in connection with field experimental work. These were all of good quality, as were also twelve samples submitted by farmers, which were all within the guaranteed composition. The registration of fertilizers has been carried on as in past years.

Wheat Investigations.—Milling and other tests and analyses are now being carried out, the receipt of a large number of samples from the wheat-growing districts affording plenty of material to work on. It is anticipated that interesting and valuable data will result from this work when completed.

Obscure or Deficiency Diseases of Stock.—This work has been continued as in previous years. Visits have been paid to the Mamaku Farm, where useful results are being obtained. It is interesting to record that one of the organic compounds of iron used in the treatment of stock (the double citrate of iron and ammonium) has been successfully made in quantity in this Laboratory from locally grown limes and lemons, and that this preparation gives even better results than the imported article.

Dipping Preparations.—Several sheep-dips have been examined. In one case it would appear that the efficacy of a sheep-dip sold in powder form, which has been reported by a user as ineffective in destroying sheep-ticks, is somewhat dependent on the length of time it stands after mixing with water. Laboratory experiments showed a constant strength for two days after mixing. The inference is that some powder dips may require mixing about forty-eight hours previous to use in order to reach the effective strength. The matter is worth further investigation. Work in connection with the testing of cattle-dips has been continued.

Dairy-products.—Various dairy-products have been analysed. An endeavour is being made to ascertain if the work of testing butter for water content in the grading-stores can be accelerated by the adoption of new methods of analysis. Potable waters for factories have been analysed and reported on for their suitability in buttermaking, &c.

BIOLOGY SECTION.

A large and varied amount of useful work has been carried out by this Section, under the direction of Mr. A. H. Cockayne, Biologist.

Seed-testing.—During the year 9,056 seed-samples were tested at the seed-testing station for germination, and some 1,500 were analysed for purity. Of this number only eighty were forwarded by farmers, which may be taken as showing an increasing confidence in the ability and desire of seed-merchants to supply good seed. This position has arisen, firstly, from the demand by the farmer for high-class seed, and, secondly, from the efforts of the merchants to cater to that demand and their widely adopted custom of selling on the certificate of this station.

This season's Chewings fescue has threshed out well, and is higher in germination than it has been for many years. Akaroa cocksfoot has been very disappointing, and consequently has been unable to compete successfully with Danish seed, large quantities of which have been imported during the year.

Research work upon the cause of and overcoming the loss of vitality in Chewings-fescue seed during and after shipment is still being continued. With the data attained from experiments carried out in co-operation with the United States Department of Agriculture, together with that from a series of experiments now being commenced, it is hoped that the Department will very soon be in a position to advise merchants, so that they may ship Chewings fescue with confidence. Various other researches in matters relating to seed work generally have been carried out as follows: Increasing germination of rye-grass by drying process; storage of Chewings fescue under cool storage and subsequently at higher temperatures; improved methods of testing peas and beans; co-operation with English seed firms in research into the loss of vitality of seeds during import and export;