

SOIL INVESTIGATIONS.

Waxy Soils.—The wax isolated from the waterproof soils mentioned in my last report has been submitted to a paint-manufacturer, who reports that it is a good substitute for shellac, which is at present 3s. 6d. per pound. He estimates it to be worth at least 1s. per pound. The matter is being further investigated, as it may be worth developing commercially.

Siliceous Earths.—Many other samples of the siliceous earth mentioned in my last report have been received from widely scattered localities, and some have received economic utilization in glue-making and in one other industry which previously imported its *keiselghur* or diatomaceous earth.

Light Soils.—A paper on "The Lighter Soils of the North Island" was published in the *Journal* of the Department for October, 1917. This paper brings out the fact that while pumice soils contain no carbonate of lime, the application of lime to pumice grass-lands often has an initial deleterious effect, which is now shown to be succeeded by a most beneficial effect. Considerable hope is thus aroused as to the future use of lime on pumice lands under careful management, and this line of investigation is being continued in the glasshouse and the laboratory.

Swamp Lands.—An article on the treatment of Waikato swamp lands, written with the collaboration of Mr R. Reynolds, of "Trecarne," Cambridge, giving analyses of different types of soil, was published in the *Journal* for July, 1917.

POTASH-SUPPLY.

A number of plant-ashes have been analysed for potash with a view to utilization in supplying the shortage of that fertilizer ingredient. All the sawmillers whose names were in the directory were circularized in an endeavour to get them to save the wood-ashes for sale to market-gardeners and others to whom potash fertilizers are essential in order to obtain the highest yields. Few sawmillers answered the circular, and still fewer showed any desire to help. One mill, the output of which is $\frac{1}{2}$ ton of ashes per week, has supplied a few tons to one market-gardeners' association.* Advantage of the presence in Australia of the Director of the Horticulture Division was taken to endeavour to obtain a supply of Australian alunite, a potash compound of which there is said to be large supplies in two localities there. Subsequently an effort was also made to obtain some through another source. Both of these attempts were unsuccessful, Australia not having enough potash for its own consumption at present. A third article, entitled "Potash in Agriculture," was published in the *Journal* for June, 1917.

LIMESTONES.

A very large number of limestones have been received, and have been tested to ascertain their suitability for application to the land either before or after "burning." An article, "Two Notes on Limestone," in the March, 1918, *Journal*, and a note on a limestone-crushing test with the "lightning crusher" by the Public Works Department, in the October, 1917, *Journal*, have been contributed.

PHOSPHATES.

A number of reputed phosphates have been tested, without, however, discovering any new deposits. Specimens of phosphate rock and pamphlets have been distributed, as in previous years. The bonus for discovering new phosphate-fields has been extended to include the Cook Islands. In these days when freights are so high and bags so expensive it seems astonishing that "double" or concentrated superphosphate is not more availed of, thus halving the cost of carriage. An Auckland firm previously stocked this fertilizer, which was obtainable from them in pre-war times at £9 12s. per ton (further details are given on p. 9 of the *Journal* for July, 1913).

FERTILIZERS ACT.

Twenty-one samples have been received from Fields Division officers for analysis under the Fertilizers Act for the past year, compared with nineteen received during the previous year. The past year's importations of fertilizers have been classified and published in the *Journal* for May, 1917.

MISCELLANEOUS WORK FOR THE DEPARTMENT.

Live-stock Division.—Several stock-foods have been analysed. Several cases of poisoning in stock have been investigated, and an article entitled "Accidental Poisoning of Live-stock," from preventable and unpreventable causes, was published in the *Journal* for November, 1917. One of the most useful of the analyses for this division was that of the "Anconia" sheep-dip, in connection with a prosecution for alleged fraud.

A number of fodder plants have been analysed in connection with nutrition diseases. A hand-power brick-machine has been purchased by the Department, at my suggestion, for making the medicinal bricks for stock for use in country where such are desirable, and where deficiency diseases are apt to develop. The machine has been installed at the Wallaceville Laboratory, and the veterinarian in charge has been advised as to the method of making the bricks.

Dairy Division.—Several samples were analysed for preservative, and potable waters for dairy purposes were examined. A number of cheese for export by the Imperial Government Supplies Department were analysed to determine whether they were in accordance with guarantee in fat-content. Forty-four samples of butter were tested to check the amount of water contained, in order to ensure that the maximum allowed, 16 per cent., was not exceeded.

* Since writing the above one firm of fertilizer-vendors has agreed to take the entire output of one mill at the price asked, provided it can be supplied equal to sample submitted.