

carried, but a charge is made according to scale. About 300 tons of the screenings containing 80 per cent. calcium carbonate is produced annually, and the following is the mechanical composition :—

Passed 1 in. mesh, retained on $\frac{3}{16}$ in. ..	8.7
„ $\frac{3}{16}$ in. „ „ $\frac{1}{8}$ in. ..	30.5
„ $\frac{1}{8}$ in. „ „ $\frac{3}{16}$ in. ..	26.8
„ $\frac{3}{16}$ in. „ „ $\frac{1}{4}$ in. ..	16.3
„ $\frac{1}{4}$ in. „ „ $\frac{1}{2}$ in. ..	5.8
„ $\frac{1}{2}$ in. „ „ 1 in. ..	1.4
„ 1 in. „ „ ..	10.5
100.0	

This may be compared with the fineness of the commercial ground limestone from Napier of 81 per cent. of carbonate of lime, as follows :—

Retained on $\frac{3}{16}$ in. sieve ..	0.3
Passed $\frac{3}{16}$ in., retained on $\frac{1}{8}$ in. ..	15.3
„ $\frac{1}{8}$ in., „ $\frac{3}{16}$ in. ..	33.3
„ $\frac{3}{16}$ in., „ $\frac{1}{4}$ in. ..	33.1
„ $\frac{1}{4}$ in., „ $\frac{1}{2}$ in. ..	11.6
„ $\frac{1}{2}$ in., „ 1 in. ..	2.0
„ 1 in. „ ..	4.4
100.0	

Many samples of limestones from Martinborough have been received and analysed. Some of these were high in carbonate-content (77 to 93 per cent.), and were so soft that they could be used as chalk on the land without previous drying or grinding.

Samples of ground sea-shells are being put on the market in the North, at Whitianga, Mercury Bay. The samples analysed contained 92 and 93 per cent. of carbonate of lime, and the fineness was as follows :—

Residue on $\frac{1}{16}$ in. sieve ..	4.8
Passed $\frac{1}{16}$ in. sieve, retained on $\frac{3}{16}$ in. ..	65.3
„ $\frac{3}{16}$ in. „ „ $\frac{1}{4}$ in. ..	17.8
„ $\frac{1}{4}$ in. „ „ $\frac{1}{2}$ in. ..	4.8
„ $\frac{1}{2}$ in. „ „ 1 in. ..	2.2
„ 1 in. „ ..	5.1
100.0	

A number of limestones have been tested from the Murchison district, and were found to be nearly all hard limestones of very variable composition—from 18 to 90 per cent.

This year has witnessed the starting of two limestone-supplying companies in the Nelson Province. One of these is to rely on direct water-power for grinding the stone—the cheapest kind of power possible to obtain. The Nelson soils which have been tested show a general lime-requirement of from 2 to 3 tons of carbonate of lime per acre, so that there should be every prospect of success in the venture—a farmers' co-operative one.

An interesting sample of quicklime made by “burning” sea-shells with wood in an open cut in the hill at Doubtless Bay was received, and had the following composition: Calcium oxide (CaO), 12.74 per cent.; calcium hydrate (Ca (OH)₂), 53.25 per cent.; calcium carbonate (CaCO₃), 26.16 per cent.; siliceous matter (sand, &c.), 7.14 per cent.; iron and aluminium oxides (Fe₂O₃, Al₂O₃), 0.63 per cent.; magnesia (MgO), &c., 0.08 per cent.: total, 100 per cent.

An article on “The Limestones of New Zealand: Further Analyses” was published in the *Journal* for August, 1918, while an article on the “Liming of Pumice Soils” appeared in the November, 1918, issue. The former article merely places on record the results of the analyses of samples, but the latter discusses the lime-requirements of pumice soils, and shows that all require liming according to the Hutchinson-MacLennan method of testing. This conclusion bears out the results of pot tests published in a previous article. The application of these laboratory findings is likely to be substantiated in the field by any carefully conducted experiments, though it is probable that the good results arrived at in pot trials under glasshouse conditions would require a much longer period to show in the field, owing to the altered conditions. It is also possible that a much finer grinding of the limestone will be desirable for pumice than for ordinary soils. The concordance of the pot trials with the Hutchinson-MacLennan tests is conclusive evidence that lime carbonate under certain conditions is extremely beneficial to pumice soils.

PHOSPHATES.

Closely connected with the supply of phosphate is the use of lime. An article was written for the February, 1919, issue of the *Journal* entitled “Economizing Phosphates.” In this it was pointed out that by using more ground limestone farmers could economize on the phosphates required to produce the usual results. Many farmers in the North are year after year applying phosphates, only a limited amount of which is effective, owing to the alteration of the available phosphate to unavailable phosphate which takes place in the soil. Theory indicates that by applying suitable