

A large number of commercial ground limestones and quicklimes have been analysed in connection with the granting of free railage concessions and a survey of the whole position that is being made by the Fields Division. In general the quality of these products is being maintained, but at times there has been a tendency for some of the lower-grade soft limestones to fall appreciably below 70 per cent. carbonate of lime and special attention has been drawn to these cases. In one instance the manufacturer disputed the analytical results, but on a personal visit being paid to the crushing-plant the discrepancy was traced to the use of a crude and inaccurate method of testing carried out at the works.

Fine earthy material from a "gusher" or bore at Kotuku on the West Coast, which was stated to stimulate growth (of pasture) was found to contain 90 per cent. carbonate of lime and 1.98 per cent. common salt. According to the Director of the Geological Survey, the carbonate of lime is present as aragonite. A number of other miscellaneous fertilizing-materials have been reported on.

TOXICOLOGICAL.

Zinc.—Two further experiments on feeding pure zinc lactate to pigs have been concluded at Wallaceville in an endeavour to determine the lower limit of toxicity. Levels of intake of 0.05 per cent. to 0.005 per cent. of zinc in the milk have again been associated with mortality and a non-specific arthritis. High amounts of zinc have been found in the organs. The total amount of zinc required to cause death has been as low as 37 grams given over two months. A third experiment feeding 0.5 gram of zinc lactate daily to weaner pigs is in progress.

Several cases of suspected poisoning of pigs from milk passed through galvanized-iron pipe lines have again occurred, and analyses have confirmed the presence of excessive zinc in the milk and in the organs of the pigs.

Arsenic.—The death of a number of cattle in the Blenheim district was traced to animals eating rubbish from a tip contaminated with sheep-dip. Appreciable amounts of arsenic were found in the organs submitted. Another case of mortality among cows following weed-killing operations was probably due to arsenic in the weed-killer.

A case requiring intensive inquiry has arisen in the Reporoa district. This isolated farming community lies to the south of the Waiotapu thermal area and also has a number of thermal and mineral springs scattered over it. Dairying, dry stock, and sheep farming are all carried on, but results, both in stock health and production, have never been as good as might have been anticipated. Continued unthriftiness and mortality of dairy stock on one farm led to an analysis being made of mud and water from a drain. Arsenic was found in both. Further investigation revealed that the mud deposited by the Waiotapu River was arsenical and that the swamp soils formed from this mud contained arsenic. The arsenic appears to be present both in combination with iron and as sulphide. Orpiment occurs in massive form in the sinters around some springs and as a finely divided precipitate in pools receiving the overflow from the Champagne Pool at Waiotapu, the waters of which contain arsenic in solution. A large number of samples have been collected, and a survey of the whole settlement is in progress, Mr. I. G. McIntosh using a portable field testing-set for this purpose. Among samples so far analysed up to 3.75 mg. As_2O_3 per 100 c.c. has been found in some drainage waters, 2.5 per cent. in muds, 0.3 per cent. in soils, 2.3 mg. per 100 gm. in dry matter of grass, and 0.6 mg. and 0.25 mg. per 100 gm. respectively in dry marrow and bone of femur of a cow that had died under suspicious circumstances.

Sand from a creek in the Tirau district suspected of causing gastrointestinal irritation in cows was found to be composed very largely of sharp flakes and splinters of volcanic glass.

In connection with heavy lamb-mortality in Canterbury associated with changing of feed from pasture to rape, analyses of several bulk samples of freshly collected rape were carried out. Only leaves and petioles were included in the samples. Dry matter varied from 16.6 to 21 per cent., hydrocyanic acid was nil, and steam distillation yielded only 0.003 per cent. volatile oil. The composition of the dry matter included reducing sugars 10.6 to 16.8 per cent., "total sugars" 25.84 to 33.0 per cent., lignin 5.7 to 24.8 per cent., cellulose 17.4 to 22.3 per cent., protein 15.7 to 21.7 per cent., lime (CaO) 1.82 to 2.36 per cent., phosphoric acid 0.83 to 1.08 per cent., potash (K_2O) 3.62 to 6.50 per cent., magnesium (MgO) 0.66 to 0.98 per cent., ash 10.0 to 15.2 per cent. It is apparent that rape is a rich feed, particularly in mineral matter, and may cause digestive upset on changing from poor pasture, but no evidence has yet been found of the presence of any toxic substance.

SAMPLES FROM FIELDS DIVISION, EXPERIMENTAL AREAS.

Pastures.—Dry-matter determinations of pasture samples from mowing trials at Ruakura have been continued. This and related work is now being taken over by the Chemist stationed there.

Sugar-beet Trials.—Many analyses have been made of sugar beet from variety trails in a number of localities, mainly in South Canterbury and Hawke's Bay, sampled at intervals during the maturing of the crop. Sugar content has been high, varying in most cases from about 14 to 20 per cent.

MISCELLANEOUS.

Several official samples of butters were analysed in connection with projected prosecutions under the Dairy Industries Act.

A so-called "sterilizer" for dairy use was found to be merely rosin soap. It was suspected of causing taint in cream.

A proprietary fungicide alleged to make workmen feel sick when mixing it with fertilizers was found to consist chiefly of hydrated lime and free sulphur with a small amount of aromatic resin. No toxic substance could be detected.