The fact that this mineral-deficiency disease occurs during the winter, when natural herbage reaches its lowest nutritive value and worm parasites are most aggressive, indicates how treatment for these latter may be followed by disastrous results. The results secured from the use of bone-flour and Radiostoleum cannot be attributed to their having special feeding-values, but merely as therapeutics designed to restore body functions to physiological normality.

VI. Lamb-mortality Investigation, Ashburton County.

During the year a number of farms in the Ashburton district were surveyed from the point of view of stock losses from disease. The highest incidence of disease from all causes on any farm inspected was 3 per cent., while the average was less than 1 per cent. As outbreaks of serious disease did not occur, these figures would indicate that stock-losses are inclined to be overestimated.

From fifty-two post-mortem examinations of lambs, wool-ball was shown to be by far the greatest cause of death. Investigations of this complaint seem to indicate that, owing to the presence of earthy material, grass-roots, and indigestible fibrous material in the stomachs of the lambs, lack of nourishment was the chief cause of the trouble.

Pulpy kidney, gastro-enteritis, inanition and phæmic nephritis were also causes of lamb mortality. The investigations generally indicated that too large a percentage of mortality has been attributed to pulpy kidney, and that the principal cause of mortality can be attributed to faulty diets.

VII. Farm Economics.

Farm-produce Prices.—Records of prices paid to farmers for wool, fat lambs, beef, butterfat, pork, oats, potatoes, wheat, perennial rye-grass, cocksfoot, and red and white clover seeds during the past thirty to sixty years have been compiled for the purpose of analysing future trends in annual and monthly prices. Investigations of actual farming-conditions at the present time in Canterbury indicate that farmers working largely on borrowed capital, after having reduced all other costs to a minimum, are faced with interest charges totalling some 75 per cent. of all costs. It is difficult at the present time to see any alleviation, except through reduction of capitalization and interest rates, or through a rise in the general price-level. In the meantime, in order to relieve the strain caused by the sharp fall in price-level, the effect of various temporary expedients has been examined.

Surveys of the beef cattle production, and of arable farming in New Zealand, embracing the results of statistical and farm-costing analysis, have been completed, while the compilation of data relative to farm-management, land-valuation, methods of land-settlement, income and expenditure for various types of farms is being continued.

A convenient small-farm account-book has been issued to enable farmers to record their business transactions during the year.

VIII. Chemical Work.

This has been mostly concerned with the analysis of samples of pure strains of grasses and clovers collected at monthly intervals during 1930 and 1931 with a view to ascertaining the changes occurring in the chemical composition of the grasses and clovers comprising normal Canterbury pastures.

A modification of the ultra-violet-ray apparatus for detecting perennial rye-grass strains has been elaborated. Records of yields of pasture from manurial applications of lime, super and sulphate of ammonia, super, nitrophoska, and leunaphos are being kept.

IX. Farm Implements.

During the year work has been concentrated on the measurement of grain-drill efficiency. Grass-drilling trials have been inaugurated, but no results are yet available owing to the fact that further attention will require to be devoted to the technique of drill operation before reliable trials can be inaugurated.

X. Farm-management.

During the past three years research has been proceeding into the methods of applying the latest scientific advances in agriculture to actual farm practice, both the methods and the results being assessed on an economic basis. Several Canterbury farms have been directed entirely by Mr. A. H. Flay, and, following an initial report and valuation, detailed records have been kept of all operations, both of cultivation and of marketing, carried out each year. At the end of the year the economic returns are reviewed in the balance-sheet, and profit and loss statements prepared. The result gives a good idea of the economic value of scientific methods of farming. On the farm which has been dealt with for the longest period under this system the budget has been balanced during the past two years despite the fall in prices, interest charges have been met in full, the earning-capacity of the farm increased, while the sheep-carrying capacity has been advanced from 160 ewes to some 540 ewes contemporaneously with an increase in the area on the farm devoted to crops. Were similar practices adopted generally—and there is no reason why they should not—the depression among the farming community would be by no means as acute as it is to-day.

In addition to the farms under detailed and complete control, there are some sixty to seventy others in receipt of periodical guidance, and who are following the guidance resulting from farm-management investigations. Consequently there are throughout Canterbury a number of farms where latest scientific developments are being put into practice along economic lines, and by this means the results of research are being disseminated widely.

XI. Iodine Investigations.

The research into the effect of iodine fed to sheep was continued with the experimental flock, the iodine being given in the form of potassium iodide. Records of the live weights of the ewes, hoggets, and lambs, lambing returns, and wool returns from dosed and control sheep have been kept. Examination of these records to date have shown that no significant results can be attached to the benefits or otherwise received by sheep grazing on a reputed iodine-deficient land when they are dosed regularly with iodine compounds.