metals suitable for use in dairy machinery and utensils, new ideas in dairy machinery and dairy-flooring materials, cements suitable for joining tiles and whey-tanks, and the use of stainless steel for whey-storage vats. Reports on the electric pasteurization of milk, dairy-flooring materials, and the use of metals in dairy-machinery already have been published in the *New Zealand Journal of Science and Technology*, and others are to follow. The information obtained by Dr. McDowall and the contact made by him with fellow-workers in similar institutions abroad have provided a splendid background for the start of his dairy chemical research work in New Zealand, and the reports he has issued should be of great value to the dairy industry of the Dominion.

Mr. H. R. Whitehead studied methods of research in dairy bacteriology at the National Institute for Research in Dairying at Reading, England, and he also spent some time at the West of Scotland Dairy School, the Pasteur Institute, Paris, and the Dairy Research Institute at Kiel. At all of these places he made contact with fellow-workers and gained most useful up-to-date knowledge of modern methods of dairy bacteriological research. He has had the opportunity of studying methods of producing and distributing graded and pasteurized milk in England. This experience is invaluable to Mr. Whitehead and to the Institute in connection with similar work he is taking up in this country.

Both Dr. McDowall and Mr. Whitehead attended the World's Dairy Congress in July, 1928, where they met fellow-workers from all parts of the world. This personal contact is invaluable as a means of cementing co-operation with fellow-workers in other dairy laboratories.

When these two workers arrived, in October, their laboratories, which had been fitted in accordance with plans prepared by them in England, were finally completed and equipped with goods selected overseas. Thereafter an assistant and a laboratory boy were appointed to the chemical staff, and an assistant and two laboratory boys were attached to the bacteriological staff. Meanwhile the erection of the dairy factory was being proceeded with by the Massey Agricultural College. Some delay was experienced with the building in the course of erection, and it was not until January, 1929, that it could be brought into operation. Whilst this delay was certainly a matter of great concern to the Institute, it afforded the laboratory workers an opportunity of getting their laboratories and routine analyses into working-order before the whole team of laboratory and factory workers started in unison. The dairy factory provides facilities for practically all phases of research work in dairying. Accommodation is provided for the manufacture of butter, hard-pressed cheese of the Cheddar and similar types, fancy varieties of cheese, and casein. There is also sufficient accommodation for the pasteurization of milk and cream, the storage of butter and cheese, and the testing of dairy machinery. Whilst no provision has been initially made for dried and condensed milks, there is room for the installation of small experimental plants and the carrying-out of experiments connected therewith. The machinery installed is in keeping with the most modern types in use in New Zealand factories. Small-scale models were selected wherever possible, but these are sufficiently large to draw conclusions as to their usefulness on a commercial scale. As far as possible variety in metals was chosen, so that the usefulness of the newer metals could be tested out in practice. The opportunity was also taken of laying different types of flooring-material in the factory, so that these could be tried out under ordinary working-conditions. Mr. G. M. Valentine, of the Dairy Division, was appointed Dairy Factory Superintendent as the result of an agreement arrived at between the Dairy Research Management Committee, Department of Agriculture, and Massey Agricultural College. The Massey Agricultural College appointed a cheesemaker (Mr. E. Sawers), and a buttermaker (Mr. J. Stevenson).

The investigations carried out in the course of the year included the following:—

(1) *Daily Variations in Yield of Milk and Fat.*—The investigation concerning the daily variation in yield of fat and milk of the cows in the College herd, which was started in January, 1928, has been continued throughout the whole of the present year. Daily records of fifty-six cows have now been collected. Records also have been carefully kept of weather conditions recorded at the meteorological station, which is practically in the centre of the dairying-pastures on the College farm. In the course of this investigation the opportunity has been taken of studying a few facts of particular importance to herd-testing. These are: (*a*) The effect of milking cows early in the morning previous to the day of test, so that the recorded yields would represent the secretion of the animals for more than the usual twenty-four hours; (*b*) the effect of uneven intervals as compared with even intervals of milking upon the amount of fat and percentage of fat at each milking; (*c*) the effect of leaving strippings on the cow at one milking upon the test of fat and the secretion of fat at the subsequent milkings.

The amount of data collected is so great that it will take some considerable time to work up. With the data available it is possible to compare the accuracy of C.O.R. methods of recording and standard group herd-testing methods with actual production. A few points arising from this work can be recorded at this time. The prolonging of the test-day by an hour or so does not necessarily increase production of the cow for that particular day, particularly if the cow is in full milk: hence the statement often made in connection with herd-testing, that the animal can get abnormally high tests by milking specially early on the morning previous to test, is open to severe question. The leaving of strippings on the cow, however, has certainly an effect upon the subsequent test. It raises the test of the milk at the subsequent or following milking, and so produces an abnormally high result for that day; but it is not an economical practice, because the additional fat so recovered does not make up for the fat lost at the previous milking. When cows are milked at uneven intervals of milking the test at the milking after the long interval is higher than that after the short milking, but when milked at even intervals the tendency is for the test to be much the same at each; it would appear, however, that some cows give their higher test in the morning, while others have it in the evening.

A point with regard to the condition of animals at the time of calving was most clearly brought to our notice. It was shown that animals coming into profit in high condition secreted milk with a higher test than normal for about the first six weeks; they simultaneously lost condition. There is a clear example here of the necessity for the better feeding of stock in the winter dry period and of the profit derived therefrom.