A special committee has been set up in collaboration with the New Zealand Meat-producers' Board to co-operate with visiting officers from the Cambridge Low-temperature Research Station of the British Department of Scientific and Industrial Research in a series of investigations into cold-storage problems in so far as they affect New Zealand meat. Two of the Department's technical officers have been attached to this Committee.

A series of investigations on the keeping-qualities of onions, also, has been carried out in association with the Department of Agriculture. The onions were placed in a specially arranged cold store in Christchurch, and after storage for a number of months were shipped for sale in Wellington and Auckland. While improvement was apparent in the keeping-qualities of the onions, the trial was started too late in the season to warrant any definite conclusions being drawn as to the feasibility of keeping onions in cold storage. The experiment has indicated the necessity of fuller examination from the mycological point of view and the control of humidity in storage.

Investigations at Cawthron Institute.

In the present incompleted state of the special cold-storage research work which is being undertaken it is not possible to do much more than outline the scheme and some of the methods which are being used to carry out the work.

It was considered that the line of work which would prove of greatest value to the industry would be a careful study of the effect of storage temperature on the keeping-quality of the six varieties of apples first in order of importance in the New Zealand export trade during a storage period equal to that occupied on the voyage from New Zealand to England. Owing to the necessity for keeping the size of the experiment within reasonable limits, it was decided to confine attention to fruit grown on one type of soil. By far the largest single uniform area of land exporting fruit in New Zealand is the Moutere Hills district, which includes not only the Hills district proper but also the Tasman, Mapua, Mahana, and Mariri areas. Fruit from this area was therefore selected for the work. Arrangements were made with the executors of the estate of the late Mr. E. H. Bisley to secure the necessary fruit from their Mildura orchards, with the exception of the Statesman variety, which they do not grow. This was secured from the orchard of Messrs. Hurst and Stewart of Redwood's Valley.

The method of picking and sampling was that employed in our own cold-storage work of previous years. A picking is taken over the whole of a block of trees, and the sampling is arranged so as to ensure that each case will have fruit in it from every tree. All fruit is picked as nearly as possible of uniform maturity and size, and is wrapped and packed in the standard Canadian case exactly as for export.

A period of four days was allowed to elapse between picking and storing the fruit, to correspond with the average length of time occupied by export fruit on its way to the stores where it is held prior to loading. No export fruit is likely to be more than eight weeks in the ship's hold on the voyage from New Zealand to England, and this was therefore fixed as the length of storage to be adopted in the experiment. At the end of the storage period the fruit is removed from store and is divided into two lots. One lot is examined at the end of three days, during which period it has been held at ordinary cool-room temperatures. This examination is designed to indicate the condition in which the fruit opens up when it is offered for sale in the London market. It is quite possible that fruit will not be sold by the retailer till three weeks after it has left the ship, and consequently the second half of each lot of fruit is left out of store for a period of three weeks before it is examined. This will then give an indication of the condition in which the fruit is likely to be when it reaches the consumer, and will provide a record of the extent to which breakdown and other diseases develop after removal of fruit from cool storage. Storage was arranged with the Nelson Freezing Co., Ltd., Stoke, and three rooms were utilized. One of these was already in operation for the storage of pears, and provided a flesh-temperature of about 35° F. A temperature of 38° F. was obtained in our small experimental room, and for securing a low temperature (32° F.), a commercial chamber of approximately 1,500-case capacity was hired. A charge of 10s. per day was made by the company to cover both rental of the rooms and cost of operating extra machinery. It was not possible in the work of this season to take into consideration the effect of the relative moisture content of the store-air, and consequently all rooms had to be so run as to produce as nearly as possible the same drying-effect at each temperature. The commercial room in which the pears were stored was not subject to our control and had to be taken as the standard. In it the humidity ranged from about 85 per cent. to 90 per cent. In the low-temperature (32° F.) room it was not possible to raise the humidity quite to this figure. The room was very large and practically empty, and in consequence the battery maintained the room at a very low humidity. Wet sawdust was spread out in the room and wet sacks were laid over the stack of fruit in an attempt to raise the humidity nearer the desired figure, but, on account of the freezing of the water, only a small measure of success was attained. Up till the time when a commercial room run at 32° F. became available the humidity averaged about 75 to 80 per cent. In the small room at 38° F., a similar difficulty was met with, but was entirely obviated by the use of wet sacks in the room. A further difficulty, again attributable to the storage of a very small quantity of fruit in a large room, was experienced in the 32° F. room. This was a marked flesh-temperature rise during the period when the plant was not running. The temperature rose about 2½° or 3° F. at first, and a jacket consisting of benzine-tins filled with water and stacked in boxes over the whole of the outside of the fruit-stack was therefore tried out as a remedy. By this means it was found possible to reduce the rise to about 1° F. It would appear that, in the absence of special stores or small chambers, such difficulties cannot be avoided, and must always detract to some extent from the value of tests on the early varieties of apples.

As far as the experiments have gone at present, the one outstanding fact brought to light is the extreme sensitiveness of the Cox's Orange variety. From the results obtained it appears that