

and D. Duncan and Reid and Gray, new machines were brought to Canterbury farmers by a number of other firms. Morrow, Bassett and Co. introduced the Burgess and Key side-delivery reaper and in 1878 the McCormick wire binder, which proved so popular that 820 were sold in the first year. John Anderson arrived from Scotland in 1850 and built his forge at "The Bricks", commencing to make implements in a small way in 1857; he exhibited in 1868 a wool press and a reaping machine and a few years later a threshing machine. Later, Anderson's Canterbury Foundry turned to making heavy engineering equipment, though it made 50 threshing machines in all. Andrews and Beaven from 1878 onward developed the manufacture of chaffcutters, grass-seed cleaners, and other machines for preparing stock feed.

REFRIGERATION

As early as 1870 the problem of surplus stock was beginning to be felt in Canterbury and that year John Hayhurst started the first boiling-down works at Milford, near Temuka. About the same time the New Zealand Meat Preserving Company started a works at Washdyke; similar businesses were started at Templeton and Styx and a number of larger stations had their own. None of them was particularly successful, and those firms which attempted to can meat for export failed completely, much of the trouble being caused by the uncertain quality of the meat canned and the amount of mutton and offal lost.

Experiments had been going on overseas for some years in an endeavour to find some practicable way of freezing meat and in 1879 a cargo of frozen beef and mutton was successfully shipped from Sydney to London. In 1881 the New Zealand and Australian Land Company arranged for a shipment in the sailing ship Dunedin, which sailed from Port Chalmers at the beginning of 1882 with 5000 carcasses, most of them from the company's estate at Totara near Oamaru, but a few from Longbeach.

First Works at Belfast

Interest in the new experiment was widespread in Canterbury, and as early as 1881 the Canterbury Frozen Meat Company was formed.



Lincoln College in 1880, the year it was opened. The need for agricultural education was realised early in Canterbury and the buildings of Lincoln College were begun in 1878.

... INTRODUCTION OF REFRIGERATION

Some of the best-known runholders were included in its directorate. Works were constructed at Belfast in 1882 and slaughtering began in February, 1883, the first shipment being made in the British King in April of that year. The company in the first few years adhered rigidly to the rule of accepting nothing but prime wethers, prime lambs, and maiden ewes, though pressure from farmers compelled relaxation of the rule in 1890. Additions to the works were made in 1887, and in 1899 a new works was built at Fairfield and another in 1904 at Pareora.

The first ventures in meat freezing were made by the larger runholders and catered largely for their needs. The Canterbury Frozen Meat Company merely killed and froze the sheep; the owner was responsible for consigning them and disposing of them in London. For the smaller farmer with a limited supply of stock this system was not especially profitable, and in 1888 the Christchurch Frozen Meat Company was formed to cater for his needs by a system of pooling consignments. This company also pioneered another activity, the use of by-products, which had previously been wasted. In 1893 it took over the business of the South Canterbury Freezing Company at Timaru, the works being enlarged and renamed Smithfield.

Though the British market provided an almost unlimited demand for meat, New Zealand's exports in the first few years had to face a good deal of prejudice and it says much for the quality of Canterbury's exports that this opposition was broken down so early. Prices tended to fall during the 1880's and the high freight and insurance rates added to the meat producers' difficulties. Freight was then about 1½d. per pound and with insurance the total was about 3d. per pound at a time when the meat was selling in London at 6d. to 7d. Frequent charges of monopolistic exploitation by the shipping companies were made, but by 1890 the total freight and insurance rate was down to 2d.; by 1897 freight alone was down to ½d.

Supremacy of Canterbury Lamb

When refrigeration was introduced Canterbury was fortunate in having large numbers of Merino and half-bred ewes which were mated to Leicester rams and produced lambs which matured fairly early and would fatten for killing. The British housewife demanded a small, lean, and tender joint and found Canterbury lamb the ideal in every way.

Canterbury took the lead as an exporter of frozen meat in 1886, when 161,000 mutton and lamb carcasses were dispatched; by 1891 the figure had risen to 691,000 and the total exports from Lyttelton and Timaru remained about this figure until 1900.

SUPPLEMENTARY FEEDING

The meat trade required the sheep to be in prime condition when slaughtered. Feeding practices improved with the fencing subdivision of properties which allowed the cultivation of good pastures, feed crops, and cereals in rotation. It was soon realised that in the climate of Canterbury supplementary feeding was necessary. Turnips were used from an early date and formed a most important part of the feeding programme, with soft turnips for late autumn, Green Globe for mid-winter, and swedes for late winter and early spring. Hay, oatshaf chaff, cape barley, straw, kale, mangolds, and young grass were also used. Spring lambing utilised the flush growth of November and December and the lambs were finished on rape, which became the general crop for fattening and proved a splendid forerunner to the wheat crop.

Rape and Turnips

Initially many turnip crops were sown after a grain crop immediately after harvest, but it was found that this did not leave a long enough growing season. The crop often failed and the consequent loss of winter feed placed the farmer in a difficult position. On the plains turnips were mostly sown as the first crop after ploughing from tussock and were followed by oats and grass, many thousands of acres being brought into cultivation in this manner. On the better land it was found that a winter fallow after wheat left the ground in good order for sowing in the following November. On this