

from pasteurized cream, was divided into several lots,—one for each preservative tested. The small lot of fresh butter was taken from the large "Success" churn and placed in a small "Simplex" churn for working. After placing the butter in the churn the preservative was sifted over the butter, and distributed as evenly as possible. The worker attachment was then put in motion and the butter was given the usual amount of working—18 to 19 revolutions of the worker. In those experiments where salt was used with the preservative, the two were weighed separately and then thoroughly mixed before adding them to the butter. All the different preservatives were plainly labelled and after weighing were placed on papers marked with the name of the preservative. The boxes and prints were numbered at the time and a record made of the preservative together with the distinguishing number so that there could be no mistake and no mixing of the different lots. Every known precaution was taken that each lot should contain the preservative intended for it and no other. In all the summer experiments, one pound print wrapped in parchment paper, and one 28 lb. box were marked and placed in the refrigerator for scoring. The boxes were lined with heavy parchment paper which had been previously soaked for at least 24 hours in a brine and formalin solution. Every precaution was taken to prevent mould or unnecessary deterioration of the butter. Four lots were made from ripened cream and two from sweet cream. In all cases the cream had been previously pasteurized at a temperature of 180 to 185 degrees F.

#### THE PRESERVATIVES.

The commercial preservatives were secured from the different firms or their agents. We wrote all the Canadian firms whom we could hear of as selling goods of this class in Canada. We explained the nature of the work we intended doing and asked them to send us a sample of their regular goods. Most of the firms cheerfully donated sufficient for our work. The borax, boracic acid and sodium fluoride were purchased from chemists. The salt was a portion of that from our regular supply.

Each of these preserving substances was submitted to a close chemical examination, the results of which are given below. The number of the chemical preservatives will be used to designate these substances hereafter.

No. 1 Commercial borax containing chlorine equivalent to 1.64 per cent. of sodium chloride or common salt.

No. 2. Practically pure boracic acid.

No. 3. A commercial preservative containing 3.75 per cent. of common salt, balance boracic acid with a small amount of borax.

No. 4. A commercial preservative containing 5.41 per cent. of common salt, 9 per cent. saltpetre, balance borax and boracic acid.

No. 5. A commercial preservative containing 6.5 per cent. of common salt, balance borax and boracic acid.

No. 6. A commercial preservative containing 10 per cent carbonate of soda, balance borax and boracic acid.