stirring, and much cheaper. A number of these agitators (momentarily stopped so that a photograph might be taken) are shown in one of our illustrations. While the agitation is in progress the cooking proceeds. By steam connections under the vats (a distinctive feature of Canadian cheddar-cheese making) the temperature of the vat is gradually raised from 86 to 98, or even 102 degrees, the aim being to get it to this temperature in an hour to an hour and a half. The steam is then turned off, and in one and a half to two hours the curd is ready to "dip." Sometimes, however, a certain vat containing some overripe (sour) milk will be "fast-working," and be ready to dip in an hour. The philosophy of cooking is this: The heating causes contraction of the curds, and, consequently, expulsion of moisture, notwithstanding that the pieces of curd are floating in a bath of whey. This contraction of the curd is brought about by the action of the rennet and development of lactic acid, which takes place very rapidly at this stage. A membrane forms over each piece of curd, which retains the fat that has been incorporated with the casein, but allows the moisture to pass through. Pieces of a well-cooked curd should not stick together when pressed in the hand.

"Dipping" consists, practically, in drawing off the whey by either a siphon or a tap. The whey runs into a gutter, which passes along the end of each vat, and leads to a cistern-like tank just outside the building, whence it is afterwards pumped to an elevated tank that should be, though sometimes is not, situated several rods away from the factory. When preliminary tests with the acidimeter show the curd is about ready to dip, most of the whey is drawn off, and the operation is completed quickly when the right amount of acid has been reached at this stage. The acidimeter is displacing the time-honored hot-iron test. The hot-iron test consisted in touching a piece of curd gently against a hot iron, and then drawing it out. The greater the amount of acid the more ductile the curd becomes. When it draws out about an eighth of an inch the curd is ready to be separated from the whey—i. e., it is technically ready for "dipping." If the acidmeter be used it will indicate from .17 to .2 per cent. of acid in the whey. This, it will be remembered, is about the same percentage as was indicated at the time of setting.

The explanation why the whey at dipping shows no more acid than the milk did at setting is, that immediately after cutting the curd, the whey will test only about two-thirds as much as the milk did. The balance is contained in the cubes of curd. As the cooking goes on the acid develops principally in the cubes of curd, and is expelled by the action of the rennet and heat into the whey. This is allowed to go on until the proper dipping point is reached.

As soon as the whey is well run off, a curd sink or "drainer" is wheeled up to the end of the vat and the curd quickly bailed into it with flat-sided pails. A "drainer" is something like a vat in shape and size, but it has no provision for steam connections underneath, and on its bottom is a slatted rack, through which drips the whey that is subsequently stirred out of the still-moist curd. A large piece of cheese cloth is thrown over the bottom and sides of the drainer—this holds the curd, while allowing the moisture to drain away. The curds are then stirred about by hand until they are drained comparatively dry.

The curd is then allowed to settle together or "mat." In about half an hour it is ready to cut into strips about six inches wide, four inches thick, and fourteen to sixteen inches long. These are turned over, and, subsequently, reversed several times. About two hours after dipping the curd is ready for "milling," an operation that may usually be deferred till after noon. The drainer is wheeled under the mill, and the chunks of matted curd are fed into it by hand, the milled curd dropping in the other end of the drainer. There are several makes of mills, but all are now usually run by steam power. The mill cuts the curd into short, square strips, about three-eighths of an inch in diameter. The more uniform the size of the pieces the better.

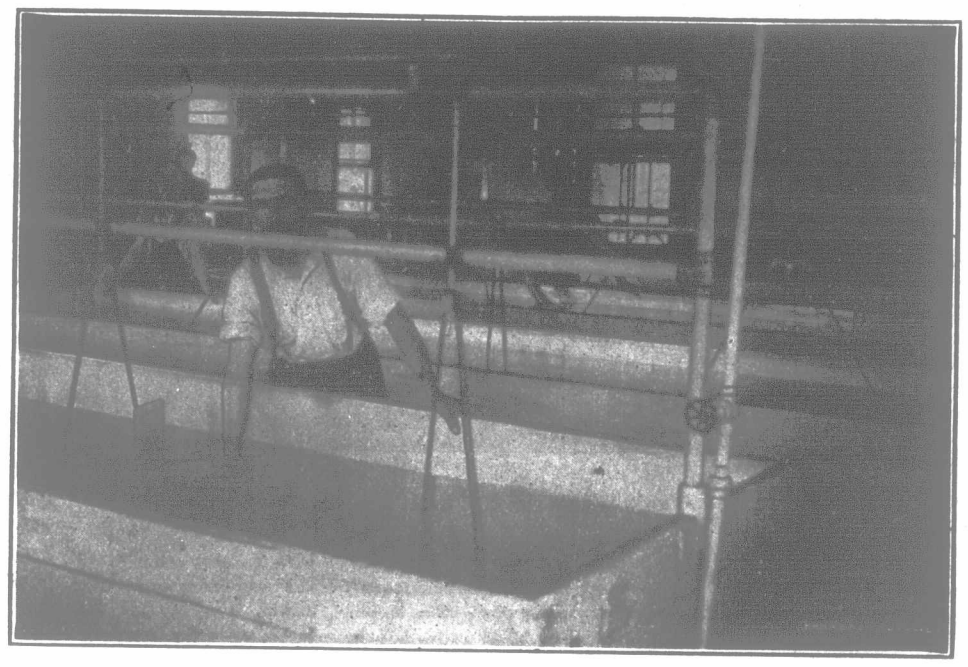
When the curd becomes velvety, and has a nice buttery flavor, it is ready for salting. About two to two and three-quarter pounds of salt per hundred pounds of curd are sprinkled over the lot. The lighter rate of salting is now commonly preferred. In the North Oxford factory the salt was first lightly brushed into the surface and then mixed through it with a special tool, resembling a fork with the end of each tine bent into an O-shape. This obviates the disagreeable job of mixing with the hands, which, if they happen to have any abrasions on them, are so affected by daily contact with salted curd that they get extremely sore.

When the curd in all the drainers has been salted it is filled into the hoops. Wooden hoops have given place to steel ones, of the kind shown in our illustration. The hoops are filled with a pail, which is hung on a spring balance and weighed. In the North Oxford factory the rule is 96 pounds of curd for each hoop, and this will make about an 84-pound cheese.

When all the hoops in one press are full, they are laid end to end, and screw pressure by means of a lever applied at one end, crowding all the hoops together and expressing the remaining whey. After being pressed for rather less than an hour, they are taken out and the "banding" (with cheese cloth) is "finished" neatly. They are then put back in the press and left till morning, when they are once more taken out, each cheese turned end for end in its hoop, and pressed again for a time. They are then taken out for the last time, and put on the shelves of the curing-room, where they are supposed to remain about two weeks. The last four seasons—1903, 1904, 1905 and 1906—the North Oxford factory is sending its cheese daily to the Government cool-curing room at Woodstock.

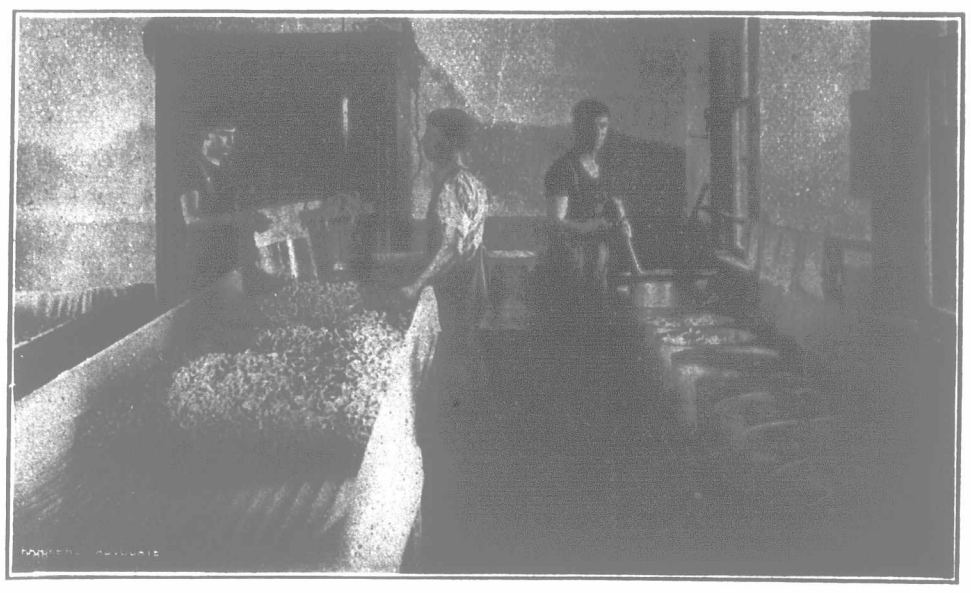
The high prices this season result in haste to ship the cheese, even from the Government curing-room, where the loss in weight during curing is not so great as in an ordinary over-heated curing-room. In many factories the cheese are being bought and shipped within a day or two after leaving the hoops.

The curing must be done some place, however, for a new-made cheese is about as digestible as India rubber. It is only when bacteria have broken down the insoluble casein into soluble digestible forms that cheese becomes the wholesome, nutritious article of diet that constitutes alike the staple food of the English poor and the delicacy of the rich.



Cooking the Curd. Note the Automatic Revolving Agitators.

Stirring the Moisture Out of the Curd, Just After Dipping.



Putting the Curd in the Hoops.

Cow Testing.

The table giving the result of the first test at Chicoutimi, Lake St. John district, shows that the 154 cows averaged, in the 30 days ending July 23rd, 718 lbs. of milk; thus the milk record of the best cow in herd 22, namely, 1,170 lbs., is an object lesson. If a few more cows gave 452 pounds above the average, what a general improvement would be made. That same 1,170-lb. cow is just 400 pounds better than the highest producer in herd 31. The lowest individual yield was 420 lbs., or 750 lbs. less than the highest.

This first test in another of the Lake St. John district associations, Riviere a l'Ours, opens with 112 cows, and a rather low average production of milk and fat per cow, about three hundred pounds of milk per cow less than it should be. The highest individual yield of milk is 820 pounds in herd 14, nearly double the best yield in herd 8, which is 388 pounds. What room for improvement! The lowest individual milk yield was 200 pounds.

The table giving the result of the seventh test at Cowansville, Que., shows a slight decrease of 2 pounds of fat on the average from the June test.

With an average production of 582 lbs. milk for all the 391 cows tested, there are four conspicuous herds with individual cows giving over 1,000 lbs. There is plenty of room for more such individuals. The highest average yield of milk by a herd was 786 lbs., the lowest 445 lbs. Highest individual yield, 1,060 lbs; lowest, 200 lbs.

The fifth test at St. Armand, Que., ending July 23rd, gives a decrease of 2 lbs. of fat per cow from the June test. Herd No. 15 has the excellent record for an eight-year-old common grade cow of 1,610 lbs. milk. She calved in May. The ten-year-old common grade cow in herd 27, calved in March, also shows up well, with 1,220 lbs. milk. The highest herd average for the 30 days was 760 lbs. milk; the lowest, 236 lbs. Highest individual yield, 1,610 lbs.; lowest, 190 lbs.

The figures giving the result of the fourth test at North Oxford, Ont., for the 30 days ending July 23rd, show a shrinkage from June of 137 lbs. milk per cow. Probably, if the heat of July had been prepared for in May by everyone in the test sowing a supplementary soiling crop of peas and oats, the 1,000-lb. average of last month might have been repeated. The highest average for a herd was 1,083 lbs.; lowest, 719 lbs. Highest individual yield, 1,420 lbs.; lowest, 145 lbs.; highest test, 4.2; lowest, 2.4.

Feeding Fat into Milk.

Bulletin No. 222, of the Cornell University, is entitled, "Record of an attempt to increase the fat in milk by means of liberal feeding." The following is a summary of this bulletin:

In a herd of poorly-fed cows an abundant ration, easily digestible and rather nitrogenous in character, and continued through two years, resulted in an average increase of one-fourth of one per cent. of fat in the milk. This was accomplished by an increase of about 50 per cent. in total amount of milk and fat produced. The increased production was secured economically, so far as the food cost of milk and fat is concerned. Whether the experiment was comprehensive enough to be really conclusive is open to question.