

The Dairy.

Rich Cheese from Skimmed Milk.

The New "Departure" in Dairying.

No movement in dairying is now being more widely talked about, and none perhaps is so little understood, as the new method of imparting a rich body to a skimmed milk cheese, as practised by the American Dairy and Commercial Company. As the question has attained such a public character, and many fabulous reports are in circulation concerning it, the *Utica Herald* resolved to investigate and furnish its readers with a straightforward, trustworthy account of what the new process is, the theory it rests upon, the practices now in operation, and the men who have the management of the business. "With this end in view," says the *Herald*, "we visited McLean, in Tompkins county, where the American Dairy and Commercial Company have had their headquarters since last spring, and where, during the summer they have been manufacturing milk according to their novel method. Our visit was made on Friday, October 29, and we were furnished with every opportunity by the officers of the company for making our investigation thorough and satisfactory. The results of this investigation will appear under the proper headings as we proceed.

The Theory.

The theory of the new process of cheese-making, for which the American Dairy and Commercial Company hold letters patent, is that skim milk cheese, a food material of little value, may be so improved by the addition of wholesome foreign enriching material, that its value for food and as a commercial commodity may be greatly increased. Second, that this being established, the cream may be taken from the milk, profitably manufactured into first-class butter, and the skimmed material may then be increased in value and nutritive qualities by substituting, in the place of the cream removed, a pure and wholesome but cheaper oil. The aim is to make first-class cheese and first-class butter from the same milk, and to gain the profit which must accrue from such an operation if successfully accomplished.

As this is a question which will call forth much comment and discussion among the dairymen, we have made a careful effort to learn the character and standing of the men who have the new processes in charge. At McLean, where the work has been going on during the summer, the dairymen with whom we conversed speak in the highest terms of the company. It was the unanimous remark of the dairymen that they never had gained so much money for their milk as this year. A. B. Lamont, a vice-president of the American Dairymen's Association, whom we met at McLean, made a statement to us to this effect. The president and manager of the company's business is Captain Henry D. Gardner, formerly of North Marshfield, Massachusetts. He is a gentleman of character, means and worth, of whom every one we saw spoke words of praise and confidence. The inventor of the process and agent for the company is Henry O. Freeman, of Sherburne, Chenango county, and to his original idea and careful experiments upon it, the system owes its present success. The company has abundant resources at command, and does not hesitate at expenditure which seems necessary to give its method full practical tests.

The Practice.

We reached the McLean factory on Thursday morning, after the coolers had been skimmed and the skimmed milk placed in vats. The factory is a large structure, 326 by 32 feet, two storeys, with a pool room in a wing adjoining the make room. The outside is tastefully painted, the windows protected with Venetian blinds, and everything about the establishment is wholesome, sweet and commendable. Of course, the interest in our visit centred in the vats, and to these we gave special attention. While the skimmed-milk was heating up in the vat, the maker, George Vandegriff and his assistant, E. N. Robinson, were engaged in the engine room preparing the oil which was to be added to the skimmed milk when the proper temperature should be reached. We examined this oil with care. It is oleo-margarine. It is odorless, and to the taste presents a pure oily flavor. A new barrel was opened in our presence. It is a white opaque mass, fine grained, and apparently pure and unadulterated. The company procures this fat from one manufacturing house in Brooklyn, where they are confident of being furnished nothing but the best material. In preparation for introduction to the

milk, the fat is heated slowly in a water bath, in deep pails (coolers), until it is melted and raised a few degrees higher in temperature than the milk into which it is introduced. In this state it is of a clear, golden color, and clear as crystal.

By this time the milk in the vat, which had been skimmed at 24 and 36 hours, was raised to 92° of temperature, and the process was begun. A light wooden frame, like that which is commonly used to carry the cloth strainer, was placed over the centre of the vat, and a tin vessel about eighteen inches square, with a finely punctured bottom, was placed upon the frame. The annatto had been previously stirred into the skim milk. When the square strainer was in position, the melted oleo-margarine was poured through it, and it spread itself over the top of the milk in a bright golden flood. The vat was quickly stirred, and then the rennet was added. The quantity was large, for coagulation is expected in eight or ten minutes. From the time the rennet was added until coagulation occurred, the milk was constantly stirred by two men. They passed up and down, one on each side of the vat, and drew over the surface a wooden agitator shaped like a hoe with a large blade. This was done for a few minutes, the men passing each other at the centre of the vat, working in opposite directions. Then they worked together from one end of the vat to the other, and returned abreast. This constant surface agitation was of course intended to overcome the rising disposition of the oil, and to force it down into the milk, where it could be taken up and held by the quickly forming curd. This stirring continued for eight minutes. As soon as the stirring ceased the milk was found to be thickened, and soon took on the form of a fixed curd. In about twenty minutes from the time of the introduction of the rennet, the maker began to cut the curd. He worked lengthwise and crosswise with the perpendicular knife, and then lengthwise with the horizontal. After the cutting the surface of the vat was covered with a heavy coat of oil, and the curd settled from view. In five minutes more the curd was worked over hastily by hand. It was coarsely cut, the pieces being as large as good sized dice. The stirring brought up the oil in a thicker coat, and the surface looked almost as golden as at the beginning. But taking up some of the curd and breaking the pieces open it was easy to see the fine globules of oil intimately mixed in the fibre of the curd, showing that the skimmed milk had taken up the oil and that the rennet had fastened upon the larger globules and held them prisoners.

Since returning to the city we have examined some curd which was forty-eight hours old, with a microscope. The difference in appearance between it and a cream curd is that the oil globules are generally much larger in the oil curd. Milk, as is known, is an emulsion of oil and a fluid which is mainly casein. The emulsion is made by nature in the animal processes. The microscopical examination of a cream curd shows that the mechanical mixture is very intimate and evenly distributed. The oil curd is also the production of an emulsion of oil with a fluid medium which is mainly casein (skim milk.) The difference between the two, under a microscope, shows the emulsion is more perfect in the cream curd; in other words, that nature surpasses Freeman. But the oil curd shows an emulsion also, similar but not so perfect as the cream curd, which would indicate that Freeman is treading on the heels of nature. Whether Mr. Freeman's process can be improved by means which will lead to a more perfect emulsion is a question. We introduce this item of microscopical examination in order that a better understanding may be gained of the way in which, as it appears under the glass, the oil and skim milk come together for mutual advantage. We return to the vat.

After the introduction of the oil with the milk at a temperature of 92 degrees, it is the practice to heat to 94 degrees. This rise generally takes place without the introduction of more steam. The stirring by hand is given the curd occasionally until it is ready to come out. It is not stirred much; only enough to keep it from baking down. After the curd had been stirred several times, and the coating of oil upon the surface of the whey was quite thick, the oil was gently pushed to one end of the vat and removed with a flat skimmer, shovel shaped. The curd was stirred again, and the whey skimmed again. Upon weighing the skimming it was found that 28 pounds of oil had been taken up by the curd; it was 28 pounds of oil to 2,500 pounds of skim milk. The skimming is held over and used the next day. After the skimming off the surplus oil the treatment of the curd is such as is commonly practised until the cheese reaches the shelves of the curing room. The novelty in the process consists of course in the introduction of the oil. It is a simple matter the agitation during coagulation to keep as much oil as possible

where the curd may enclose it, and the gentle handling afterward so that the bonds may not be broken. There is no secret about it. It is simply mixing oil and skim milk, putting in rennet enough to bind them quickly together, and letting the forces which operate during the curing process work upon until the curd is broken down, enriched and transformed into a mellow cheese.

The Cheese

At the McLean factory we examined the cheese very thoroughly. There were about 3,000 on hand, and we bored them freely. We acknowledge to have been surprised at the quality disclosed by the tricer. There was plainly a lack of fancy flavor, but the way in which the skim milk has been brought to produce a rich mellow cheese with a good flavor is wonderful. It is not quite right to judge the cheese by the standard of fancy, because if the material of which they are made (skim milk), were worked without the enriching, the result would have been exactly the reverse of fancy. It is difficult to judge the cheese by the standard of skim cheese, because there is seldom a cheese which shows even a trace of skimming. The curing seems to be delayed longer than in full cream cheese, and the greater age given the more perfect seems to be the incorporation of the oil, and the smoother and sweeter the body of the product. The cheese at McLean is above the average of the full cream cheese which we have inspected this season in marketable qualities. The butter which is made of the cream is a strictly fine creamery article. It is made according to the usual creamery practice.

The Profits.

The profits made by the new system of manufacture are greatly discussed by the dairymen in the region about McLean. Mr. Lamont remarked to us: "The company have done well by us, and they have done well by themselves too." The milk has been bought from the patrons according to the following plan:—Ten pounds of milk is called one pound of cheese, and for every ten pounds of milk the dairymen receive the highest New York quotation less two cents. This is more than the McLean dairymen ever netted for their milk before. But the dairymen are so well assured that there is money in the practice to the manufacturers, that they are half in earnest when they smilingly ask for a little more pay next season. This we mention because it reflects the views of the dairymen in the country around McLean. We left no stone unturned during our visit, in order to furnish our readers with the facts about this novelty in dairying. We went to learn just what the process and its results are, believing that it is necessary first to know before embarking in controversy or approval. It is such information which we lay before the dairy public.

The company is taking active measures to introduce its system of manufacture more widely. I. H. Wanzer, the large butter maker of Elgin, Illinois, has made arrangements to employ the process in making up his skim milk. He went to McLean and remained in the factory several days, examining the process at every step. His examination led to the adoption of the method. The dairymen of Central New York will soon have an opportunity to learn from observation also, for the company, we understand, are taking measures to start a factory in Onondaga county. We shall watch the matter closely, and shall not hesitate to speak plainly as occasion may demand. At this time we have aimed only to define and describe."

Handling Butter in the Irish Market.

The following extract is from a letter received by Mr. Richards, of the firm of Richards and Gooch, Chicago, Ill., from his partner, who is now in Europe, and gives an interesting account of the manner in which butter is handled in Ireland:

I visited Cork and saw the most systematic method of handling butter I have ever seen. They handle from 1,500 to 3,000 barrels per day. All butter is taken to the butter market for inspection, before going to the party's store to whom it is consigned. This market is a large stone building, but only one storey high. It is divided off in five sections, A, B, C, D and E. These sections are filled with butter as it comes from the depots. There are five inspectors, sworn by the company to perform their duty faithfully. They ballot every morning to see which section they are to inspect, so they never know which butter is to be looked at by them. I inquired of several merchants whether they ever had any difficulties with inspecting butter in this, and they informed me they had not. I think it is the best system in the world. The market is cleared up every day. I find our medium grade of western sound butter would inspect about fourths.