

it takes to grind, &c. It was replied that they could be made very simply. Messrs. Wilmot and Galloway made their own. The mill consists of a cylinder of wood, full of small iron spikes, half an inch or so apart. Nails with their heads filed off will do. The cylinder may be from 8 to 12 inches long. It is hung in a semi-circular trough, also having spikes in it. Cog wheels and a handle to turn with are all the machinery needed. About 15 minutes grinding will do for an ordinary batch of curds.

3. What constitutes the superiority of the Cheddar system of cheese making, and could it be adopted with advantage in Canada?

Mr. FARRINGTON was of the opinion that this question was virtually comprehended in the two preceding ones. It was his impression that the two characteristics of Cheddar cheese were: 1st, cleanliness, and 2nd, grinding the curd.

Mr. BALLANTYNE, of Perth, observed that he believed there was another peculiarity about Cheddar cheese, namely: the development of acid in the whey to a given degree, and that this was a point of no small delicacy and importance.

Rev. W. F. CLARKE said Mr. Ballantyne was quite right. He understood that a minute account of the Cheddar process would be given by Mr. Willard in the address which had been made the order of the day for half past seven, p.m., and he would suggest that the further consideration of this question be postponed until after the delivery of Mr. Willard's address, which was at once agreed to.

4. Statistical circular—could it be made useful in equalizing and maintaining the last price for cheese the current year?

Rev. W. F. CLARKE thought the Association would be better prepared to discuss this question to-morrow morning, when Mr. Willard would lay before the meeting some very valuable statistics prepared by him for the recent Convention of American dairymen at Utica. He moved that the question be laid on the table until then, which was carried unanimously.

5. How long is it desirable to press cheese? Would two or more days improve the quality or texture?

Mr. FARRINGTON remarked that he had been a cheese maker for thirty-eight years. In the early period of his dairying, he always pressed two days, latterly he had only pressed half the time, but he believed his earlier practice was the best. Indeed, he thought three or four days would be better than two, but whether it would pay to provide the extra hoops, presses and space requisite for such long pressing, was another question.

Mr. COLLINS, of Dereham, had tried various lengths of time, and preferred 48 hours.

Mr. SCOTT, of Lobo, had been obliged, by hurry of work and limited space, to take some cheeses out of the hoops at ten hours, and could never see any difference between them and those that were longer in the press.

Another speaker (name unknown) had often taken cheese out of the hoops at four hours, and they were just as good as those that were in longer.

Mr. FARRINGTON referred to the subject of huffing in cheese. He did not think this resulted from want of pressure, as many supposed, but from some chemical cause, which no amount of pressure could remove.

6. Is it not practicable to adopt the American system of making cheese once a day, and would it be preferable to making twice a day, as practised by our factory-men.

Mr. YORK, of Elgin, stated several advantages he had found to arise from making up once a day. It was every way preferable to the practice of making twice a day. It was easily managed, if you have a stream of cold water to flow underneath the vats. He had a half inch stream, temperature forty degrees, flowing under each of his vats.

Mr. FARRINGTON thought there was a better system even than the American, and that was never to make up new milk. Leave a milking, if possible, twelve hours to cool. He had made eight cheeses on this principle, and they were the best he ever made. He had no doubt if we would adopt this practice, we should beat the Americans all hollow.

The question was asked if it was advisable to put ice in the milk. Mr. Farrington replied that he had tried it, but in his opinion there were objections to it.

The Association then adjourned, until 7, p.m.

Shortly after that hour, a large assemblage had convened, the general public of Ingersoll being pretty well represented, in addition to the cheesemen from different parts of the Province. The President called the meeting to order, and stated that the chief business of the evening was to listen to an address from X. A.

Willard, Esq., agricultural editor of the *Utica Herald*: without any preliminary observations from the chair, he begged to introduce that gentleman to the audience.

MR. WILLARD'S ADDRESS.

Mr. WILLARD spoke in substance as follows.—It is highly gratifying for me to appear again before a Canadian audience, and to assure you that my countrymen entertain the most profound respect for the people and Government of the Dominion. We have, indeed, knots of men and partisans among us, who are anti-British in feeling, but these do not influence the deep under-current of substantial good-will of the nation at large. The resolutions passed unanimously at the late Convention of American Dairymen at Utica, welcoming the delegates from Canada, indicated the existence of this auspicious feeling, which it is to be hoped may ever continue. There are so many things to be said about the dairy, that one is at a loss to know what facts it would be best to group together in an hour's talk. I shall assume that I am addressing practical men, who desire useful information clad in plain language. After glancing at the history and gradual development of the dairy interest in New York, Mr. Willard observed that American dairying now represents a capital of more than six hundred millions of dollars. The cheese product of this year has sold for more than twenty-five millions, and the butter product for at least one hundred millions. In 1865, the butter product of New York alone was estimated at sixty-five millions of dollars. That year there were thirty millions of gallons of milk sold in the State, which, at 4c. per quart, would amount to near five millions of dollars. From these figures it will be seen that dairy farming is a most important branch of American agriculture, and is destined from year to year to increase in magnitude. The idea of associated dairying is claimed by some to have originated in Europe. But it is widely different from the system now practised in this country. French and Swiss peasants, each owning one or two cows, unite them in a herd, employ a herdsman who takes them to the mountain pastures of the Alps, watches them, and with the help of assistants, makes cheese from the milk, which at the close of the season is divided among the owners of the cows, according to the number furnished by each. Only on such a system could cheese be made to advantage from one or two cows. But such a system could accomplish no grand results, nor become generally adopted. Associated dairying, as it exists on this continent, is a widely different affair. What distinguishes the American system is the constant effort to reduce the whole art and practice of dairying to a science. The end sought is to make associated capital pay better than non-associated capital. It is a new application of an old principle. It is adapting the same rule to farming which has been found successful in commerce and manufactures. Providence appears to be making use of it as a means of lessening the drudgery of the farmer's vocation, and increasing the comfort of his lot. God in His infinite goodness wills that science, mechanism and intelligence shall be the main forces to open up to us the resources of nature. The dairy farmers of America may justly claim to have been the first among agriculturists to apply practically the principle of association on an extended scale. What is to be the result of the expansion of this method of operation we cannot foresee. At present, however, it compels thought and effort toward the improved manufacture of dairy products, since "poor goods" are sure to become a drug upon the market. It will be my object to point out briefly the more important requisites for success in dairy management. After describing the microscopic appearance of milk, giving the analysis of it, and proving the arbitrary nature of the taste that rules in the markets of the world, Mr. Willard observed that the English taste, which we have to consult, requires a mild, clear flavour, with a certain mellowness of texture, readily dissolving under the tongue, and leaving a nutty new milk taste in the mouth. The English demand a cheese of solid texture, and free from porosity. The market value of cheese depends on its conformity to these requirements. To secure this, it is not merely necessary that cheese be rich in butter. Dr. Voelcker, the eminent English chemist, has proved by analysis that common American cheese is richer in butter than the best English Cheddar, which is the highest grade of cheese known in the British market. The peculiar quality which gives cheese its value in the market, though it arises to some extent from the butter it contains, depends in a higher degree upon a gradual transformation which the casein or curd undergoes in ripening. Proper ripening is,

therefore, a matter that demands close attention, careful experiment, and intelligent supervision. No effort should be spared to acquire skill in this part of dairy management. The component parts of what is considered the best grade of cheese in the English market are as follows:—

Water	33.02
Butter	33.15
Casein	28.12
Milk, sugar, lactic acid, and extractive matter	.96
Mineral matter	3.85
	100.00

Thus it appears that good cheese, when properly cured, has about 34 per cent. of water, and less than 1 per cent. of milk, sugar, lactic acid, &c. Analyses prove that the proportion of water should not be above 31 per cent., since an increase above this amount indicates bad flavour. A due proportion of water imparts to cheese a smooth and apparently rich texture, which manufacturers should aim to secure. If too much water be taken out, the result is a dry, stiff cheese, which will appear less rich than it really is. Any process of cheese-making, by which we may be able to judge most accurately as to the amount of moisture to be retained in the curds, will be most successful, other things being equal. Another point needing attention is the shape of cheese. This undoubtedly has a considerable influence on flavour. Facts prove that when there is a good proportion of butter in the curds, thick shapes like the Cheddar and Silton seem well adapted to secure mild, clear flavour, but skim milk cheese should always be made flat and thin. The saline taste sometimes complained of in old cheese is attributed by Dr. Voelcker to ammoniacal salts developed during the ripening process. These always have a pungent, saline taste. This is an evil that increases with age. It is caused by a portion of the casein or curd suffering decomposition in consequence of the ripening process not being properly conducted. Another thing which trade and our own interest imperatively demand, is the production of cheese that is slow of decay—that will retain its good qualities for a long period of time—one that can be kept either at home, on the factory shelves, or in the hands of purchasers, without fear of deterioration or loss. English shippers and dealers have always complained of the early decay of American cheese, and the fear of loss from this source has had a bad influence on the market. Haste to sell has resulted from the fear of deterioration, and prices have often been brought down in this way. There has been improvement in the keeping qualities of our cheese during the last few years, but there is room for improvement still, and no factory should make a pound of cheese the coming season, which cannot be kept without injury, at least, for several months. There is not much doubt but that stocks the coming season will have to be held to a greater extent than ever before, or low prices accepted. We must be prepared to meet the emergency. The desired result cannot be secured by manufacturers, without the earnest and hearty co-operation of patrons. The first requisite to success is *pure, clean, healthy milk*. To obtain this, upland pastures should be used. Uplands for pasture, lowlands for meadow. Then the herds must be driven very leisurely from the fields. Dogs are a great curse to dairy farming by chasing the cows and causing them to come to the stables in a heated condition. Good milk cannot be had under such circumstances. It is cruel to let a poor dumb beast be chased violently over the pasture, painfully swinging a distended udder at every step. He who suffers this should be made to feel a loss by the rejection of his milk at the factory. The dirty practices of milkers must also be put a stop to. When such things are considered, it is no wonder that much of our cheese is condemned. If you Canadian dairymen would succeed, you must avoid these errors. One of the good things done at the recent Convention of American Dairymen at Utica, was the resolution passed condemning the use of the wooden pail for milking. It is a great nuisance, and a fruitful source of ferment most injurious to the milk. So easily is milk tainted that even carrion in a field where dairy cows were pasturing, has given trouble in making cheese from the milk given by those cows. Ferments resulting from offensive matter in the milk, often occasion bad flavour in cheese. These are a fruitful cause of porosity and huffiness in cheese. Small particles of milk in the corners of pails, or upon utensils exposed to the air, rapidly decompose and operate upon the new milk with which they come in contact, in the same way as yeast, or in the same way as a small piece of putrifying meat in contact with sound meat imparts the influence of decomposition and decay. To kill these ferments requires a temperature of 212°. Nothing short of boiling heat will accomplish it. Hence, in cleansing pails and dairy apparatus, care should be taken that the water used be boiling hot. Half the dairymen do not understand this fact, but it is of