THURSDAY, JANUARY 7th, 1904—9 A. M.

Convention met pursuant to adjournment.
Acting-President Powell in the chair.

SOME THINGS OUTSIDE THE CHEESE FACTORY.

PROF. F. G. SHORT, FT. ATKINSON.

Theoretically, a cheese maker is supposed to be sufficiently busy with work inside the factory to leave him but little time to interest himself with outside affairs, but practically his interests outside are as great, if not greater, than that branch of his work relating directly to the making up of milk.

In actual work we have a condition where the patron is at one end of a see-saw, the consumer at the other and the cheese maker in the middle, trying to keep both ends even.

An average cheese maker can take good milk and make a good cheese, but it needs no prophet, nor the son of a prophet to foresee that dirty, tainted milk will make a poor cheese in spite of the efforts of the most successful among you.

A cheesemaker shut up in his factory with a vat of milk to make up, is like a young bear, with all his troubles before him; out of that vat of milk may come many things in the way of cheese, good, indifferent, poor or bad, according to the condition of his material, and the chances are that considerable of the output will be classed otherwise than good. The cheese maker's ability to change the quality of his milk is limited; he can neither pasteurize nor sterilize; the little he can do with a starter towards improving conditions does not have a marked influence on the quality of the milk, if it is poor in the beginning. So his skill is largely dependent on the personal habits of from 20 to 60 men who supply him with his raw material,
and it naturally follows that he must take an interest in things outside the factory whether he desires it or not.

A cheesemaker starts with a product that once was pure and without contamination. If it only had remained in that state, had come to him fresh from the cow without going through the handling from udder to pail, pail to can, can to weigh can and thence to cheese vat, what might he not do with it in the way of turning out a prize winning cheese? But between the ideal milk and the prize winning cheese stands an invisible army of more millions than can be counted—destroyers of the good quality of milk and the cheesemaker’s peace. It is perhaps lucky that they are invisible or else along in the hot month of August we should have cheesemakers seeing things at night, for if we would watch them at work, the last state of that man would be worse than the first.

Now there has been much talk, experiment and advice concerning the methods to be used in making poor milk into good cheese. Doesn’t this savor much of locking the door after the horse is stolen? We will take it for granted that every man at this meeting keeps his own sidewalk shoveled off, or in other words, does his utmost to keep his factory, its utensils and surroundings, including the whey tank, in a cleanly condition. For what shall it profit a man who contaminates his milk by having a dirty factory and tries to make good cheese in it? So we will assume that all his troubles come from outside, and coming from outside, what can he do to remedy the trouble?

Naturally, the first thing to consider is what the troubles are and their source. In a majority of cases, the cheesemaker’s troubles, their origin and supply, all start from one source, the careless patron. He is the source from which a constant supply of dirt, bacteria and filth of all kinds flows in a constant stream into the receiving tank. But then, there are patrons and patrons and what, with the dirty one and the careless one, the good one is usually lost in the shuffle, and for our purpose is only useful as an example.

Of course, in hunting around for the source of trouble, the first thing we strike is bacteria, a word that seems to have been much overworked of late in the dairy business, but which explains so much and accounts for so much, that we must use it if we expect to get out of our troubles.
Call it bacteria or dirt, dirt or bacteria, as you will. Use the common or scientific name; it all means the same thing in the end and both are just as troublesome to the cheesemaker under either name. So, granted that we know what the trouble is, let us see where it comes from and if we can break the endless chain that leads from patron to cheesemaker and from cheesemaker to patron in one continuous round.

When cheese making is started in a new country, that is, one that is just being settled, it is the universal experience that an exceedingly fine quality of cheese is always made.

This means, of course, that the country has not been seeded with the various forms of bacteria that injure the quality of the cheese. Bacteria, like other plants, require the proper soil and the proper conditions for growth, and the new country has no barn yards containing dried manure, no roads supplying infected dust to every wind, no pig pens, nor any of the infected spots that man loves to surround himself with. What little material of this kind that is made, is soon destroyed by sun and air.

But when the settler comes, he brings with him many things that were best left behind. Weeds and rats always follow civilization, and also bacteria of all kinds and species. It takes time for them to be fully established, but once firmly settled, every hole and corner that affords food and shelter is swarming with them.

We know they are there, but how do they get into the milk? There are many different methods, but dirty cows, dirty milkers, dirty milk utensils and dusty air in stables, and the general dirt that is part and parcel of everything around us, are the usual sources.

To know that everything around us aids in contaminating the milk, is enough to make a man throw up his hands and quit, but as we grow crops only by keeping the weeds down, so we can produce good milk by knowing how to keep the bacteria down, and in this case especially, knowledge is power, if rightly used.

Let us begin at the beginning—the milk in the udder. For all practical work this milk is pure, with the exception of the small amount that is contained in the lower part of the teat, and whatever happens to it after it leaves the udder, in the way of contamination, is the result of its surroundings.
The milk coming from the udder in fine, thin streams necessarily exposes a large surface to the air and thereby takes up numbers of air germs, that is, those that are floating in the air of the stable. These find the best conditions for growth in the milk pail and thus start the milk on its downward path.

Along with the first streams of milk comes the bacteria that are held by the milk just inside the teat, and these add a second class that are in active growth and ready to enter at once on their anti-pure-milk work. Then the milk pail contributes its share, the milk can also, and by the time the milk gets to the cheesemaker, it has been thoroughly seeded to a crop of troubles that are full grown before he is ready to set the milk.

Of course all of this is nothing new. The cheese maker has had bacteria talked at him, written at him, and thrown at him in ponderous chunks until he is like a man with consumption; who is told all about the bacteria that causes it; how it looks and acts; how many of them he has got; where they come from and where they will go after they have got through with him; in fact he is full of knowledge regarding his particular bug, but it doesn't help him to get well.

So we will leave out all description to the particular breeds of bacteria that afflict cheesemakers; omit their pedigrees and families, and see what can be done in the way of producing milk without them.

Civilized man is a dirty animal; he is born amid dirty surroundings, lives in dirt, dies and goes back to dirt, and it is only because he comes of a tough breed that he does not die long before his allotted time, consequently it is no wonder that his productions are dirty, and milk is no exception of the rule.

There are a few cases in this country where this fact has been appreciated and the result is clean cows, stables, men and milk, and the price obtained for such clean milk is something astonishing.

This certified milk is at one extreme, the average cheese factory is at the other end and the question is, whether somewhere there is not a middle course of comparative cleanliness that is practical to the producer and beneficial to the cheese maker; one that will give him milk sufficiently clean to make good, well flavored cheese.

The primary condition for producing clean milk is the pos-
session of a clean stable. Now, as everyone knows, in the building of a stable the question of cleanliness is of secondary consideration. Cheapness comes first, convenience second and cleanliness, if thought of at all, is somewhere in the background. The result is rough walls, ceilings and floors, an ideal combination to catch and hold dust and accumulate spiders’ webs, and where every air draft or touch of hand or clothes sets in motion a fine cloud of bacteria-containing dust.

The only remedy for this condition is a smooth-walled, tight-jointed stable, one that has no dust shelves on the sides, nor holes in the ceilings through which hay dust may fall. If such a stable can not be provided, much may be done toward improvement by an occasional sweeping of the stable while the cows are out for exercise, as well as a liberal use of the whitewash brush. Whitewash covers a multitude of sins in the way of dirt and is death to bacteria whenever found.

Ventilation goes a long way towards removing dust from the stable and an examination of the ventilating shaft, if the light is good, will show a constant stream of dust particles shooting into the outer air.

Hay dust is the home of more cheese troubles than any one thing around the stable, so feeding and milking should not be carried on at the same time. Old, musty or mouldy bedding straw should not be used just to save it; it is expensive in the long run as shown by the cheese.

A milk pail that has received a wipe and a lick and a milk can that is in the same condition, cannot be excused. Soap and hot water are cheap, washing soda cheaper still, and no dairyman’s time is so precious that he cannot afford to provide clean milk utensils. All this is practical, common, every-day cleanliness,—such as any one has a right to ask of the place where human food is produced, and it is imposing no hardship on the patron when he is asked to improve his conditions to this extent.

The one great trouble with any system of cleanliness is the numerous unsuspected holes through which troublesome dirt will creep in. A man with the best intentions towards cleanliness may not succeed in reaching his desire. What is one man’s idea of cleanliness may be dirt to another, but there are a few things towards which every patron of a cheese factory may
strive successfully,—more light and more fresh air in the stable,—these are cheap; better arrangements for bringing the feed and removing the manure; a little time each day spent in keeping the stable clean, and the cows also; a coat of white-wash each year to kill bacteria and lighten up the stable,—this also is cheap. If possible, a tight ceiling overhead to keep hay and other dust from falling in a fine shower over everything in the stable, including the milk pail.

None of these things are expensive, but they go far towards making better milk, and what is also important, towards more healthy animals in the herd.

Then there are things which require no outlay of money, but merely personal care and personal cleanliness. Any patron who allows his cows to remain dirty, covered with a thick coating of manure, is a personal enemy of the cheesemaker. No man can do clean work with dirty tools, and if the cows are covered with manure, the milk will contain it in some degree.

Again, the cows in summer have a decided liking for mud, both for cooling purposes and to keep the flies away. Slough mud on the udder is easily transferred to the milk pail, from whence it is transferred to the cheese.

An udder that is covered with slough mud should be washed; a cow that is covered with a coating of manure should be cleaned; there can be no ifs or buts about those two statements, for otherwise the cheesemaker receives poor milk.

Then there is another point: If the milk is fairly good, it will go off unless it is cooled. Warm milk is the ideal home for bacteria; there they live and multiply, but cool it and the trouble stops completely or is very much lessened. Therefore the patron should be encouraged in every possible way to supply cooled milk to the cheesemaker.

If the cheesemaker could destroy all the rusty, old, dented cans that come to the factory his trouble would lessen proportionately. An old can is the source of much evil. They are hard to handle, which is important; they are impossible to clean, which is more important, and they are generally a nuisance, therefore, an old can has no place in handling milk.

Supposing we make a list of those things that a patron can do without incurring prohibitory expense.

He may be asked to do the following things, and the cheese
maker by gentle insistence can persuade many of his patrons to adopt them, to their and his own benefit, especially his own.

He can ask the patron, especially when building a new barn, to see that the cow stable is smoothly sheathed inside to prevent the accumulation of dust and the sifting of hay dust from overhead.

To whitewash the stable once a year at least; to clean it several times a year by removing all trash and dirt, brush down the cobwebs and accumulated dust.

To keep the cows clean, not allow them to wade through sloughs of black mud or liquid manure, to give them clean drinking water, and not allow the barnyard to become a mud hole. Also to provide clean bedding, and stop that exceedingly filthy habit of wetting the teats with a little milk before milking.

To wash all cans by first using luke warm water, after washing with warm water and washing soda, and finally rinsing with boiling water and standing them in the full sunlight, which is an excellent sterilizer.

To use milk pails and cans for no other purpose than handling milk, and especially not to take back the whey in the can the milk is brought in. To empty and clean the cans as soon as they get home and not leave them standing in the sun to do other things that seem more important.

There are very few things around the farm that should come before a clean milk can. If the can is allowed to stand with sour milk or whey, it becomes so infected that the usual washing has but little effect, owing to the thin film of casein that forms on the tin can and affords a constant daily supply of bacteria.

To burn the cloth that has been used to wash the cans and not buy a new one.

Although the above list is somewhat long, there is nothing in it that is either expensive or asking too much of the patron, but they are things that mean much to the cheese maker who handles the milk.

The man who tries to get through a crowd by rushing usually finds himself stopped by the slight obstruction offered by each individual, but if he goes slowly, finding a passage-way here and a hole there, he can usually get through. So if a cheesemaker should suddenly propose to his patrons such rad-
ical changes towards cleanliness on the above line, he would probably find them united in offering resistance towards any suggested changes, but like the man and the crowd, he can obtain his end by indirect means.

Steady, gentle push will go far in cases where a club would be useless.

You will probably ask about now: Where does the cheese maker come in and why should he look after the dairy habits of his patrons? Well, a stream can never rise higher than its source, nor a cheesemaker's product be better than the quality of the milk brought to him. Imperfect milk means imperfect cheese; tainted or gassy milk always makes tainted or gassy cheese, and although by your skill in making, you may be able to remedy some of the faults, by the time the cheese comes to the consumer, the faults are the most prominent thing about the cheese, and a consumer remembers one poor cheese and forgets ten good ones.

The cheesemaker wants good milk because it lessons his labor, keeps up his reputation as a maker and in every way that can be enumerated it is to his advantage. Let him, therefore, put some of his energy into a pure milk supply outside and he will not need so much energy in remedying troubles inside.

Although the patron is not a sinner above all who dwell near a cheese factory, he is the only one who interests us at present. The cheesemaker has his faults, but they are inside the factory. Others may do missionary work in that country, but for myself, I will remain where I started—outside.

DISCUSSION.

Mr. McKinnon: This paper was so well written and the points so well taken in every respect that there is not much opening for questions. If a paper like that will not reach our patrons I do not see how they can be reached. If they could have spread out before them the cool facts as they are contained in that paper, no progressive farmer can read it and fail to see its importance.

A Member: Professor Short, do you find that in the older
dairy districts there is more to contend with in cheese making in the way of undesirable bacteria?

Professor Short: I do not think there is much doubt about that. In the older dairy districts in this state and in Minnesota and down in New York state they have found that to be true, and it is a fight all the time to keep the quality of cheese from running down.

Mr. Singleton: In western Ontario, in the older cheese districts, the same is true. Every year there are new germs that we have never known of before, appearing.

Mr. Van Leeuwen: We examined nearly a carload of New York cheese in Kansas two years ago, and there was something about them that I could not understand. I have never run across it in our part of the country, and I could not determine the cause of it. The cheese were fine, white New York cheddars, and they developed a very bitter flavor, and where they were packed two in a box between the two cheeses, the tops got slippery and you could just put your hand on top of the cheese, and push the top of it off, paraffine and all. I thought perhaps it was due to the paraffine, but I couldn't, of course, lay that bitter flavor to that. The entire car of cheese was in that condition, but, on the other hand, the cheese were made in one system of factories. Three or four months after that I was in Kansas City, and one of the large wholesale houses there, cheese buyers, asked me to go into the cellar and take a look at some cheese there. The minute I got in there, I said, "You have got the same thing here that we had three or four months ago in an entire carload of cheese," and on examination I found that it came from the same district in New York. Now, if there is any one here who knows anything about that, I would like an explanation. I think it was caused by something outside of the factory not under the control of the cheesemaker. Of course, we are new out in our country and we have lots of wind and sunshine, but we never struck anything like that.

Professor Barr: We have what we call "bitter" milk over in our neighborhood that will give just such conditions as the gentleman speaks of. It is worse in the winter and we think it is increasing. At first, it was just in warm weather, but now we have it the whole year. Professor Harrison has discovered a
germ growing on trees and he suggests that that is where it comes from.

Professor Short: I have noticed a bitterness in some cold cured cold storage cheese.

Professor Barr: The cold storage does not improve this flavor at all. It is in the cheese, and if any of you have it, you will readily know it. You can’t get the curd cooked; it will make a soft, mushy curd. The acid will develop very, very fast, and you can’t get it cooked. The result is it makes a weak-bodied cheese, and, of course, the flavor will develop very fast in that kind of cheese. Our remedy has been, where we know we are going to have that kind of milk, we set it as sweet as we can get it, and cut it fine, and get it well cooked. That is the only remedy I know of to expel the moisture. If you can expel the moisture by cooking it, then there would not be so much trouble in making a nice cheese. I can only say I hope that you may never have this flavor in Wisconsin. We find it the hardest thing we have been up against in Canada.

Mr. Marty: I found last summer in my travels, milk that required two hours and ten minutes to coagulate, while the milk of other patrons would come along in six minutes, and when the milk would become mixed in the kettle, it seemed as though the rennet did not have any effect, that the casein would not precipitate. I think it was very near the same condition as the gentlemen have just spoken of, and I found it nearly all through the first part of the season. If it was not handled very slowly, you could not get it cooked. The cheese makers in the Swiss cheese industry were troubled with it nearly all summer.

Mr. Van Leeuwen: To go back to that bitter cheese flavor, I thought that those cheese, when we first got them, did not show that flavor so pronouncedly, at least. Of course, I don’t know whether there was any cold storage entered into that question at all. We did not keep part in cold storage and part in a warm room to see what the effect would be, but we know that it did develop very rapidly in cold storage, and was very pronounced. I wonder if there have been any experiments made as to the effect of cold storage in such cheese.

Professor Barr: The only place we have cold storage to any extent is in our government cold storage plants. The tempera-
ture is about 37 or 38, and as far as we have been able to learn, there is no difference in the development of this flavor.

THE CHEESE MAKER AND THE PATRON.

C. H. EVERETT, RACINE, WIS.

I believe in you and your organization, else I would not be a member of your association, and would not be here to address you. I believe in Wisconsin and Wisconsin farmers, of whom no state in the Union can boast of better, more intelligent, or progressive citizens. I know of the superior conditions that exist in our state for the manufacture of fine cheese and other dairy products, and I am also conversant with some of the reasons why Wisconsin cheese has not always, and is not now, as good as it might be, or as good as it should be. I am not a cheesemaker and know but little about the manipulation of milk in the factory for the production of good cheese, but I have been a milk producer for a good many years and from a knowledge of the dairy business gleaned from the hard school of experience I came to the conclusion years ago that Wisconsin dairymen were not making the most of the splendid opportunities at their command, and so, as my good friend Governor Hoard says, "I began to preach the Gospel according to the cow," and am still at it.

No state has more favored conditions of climate, water, and feed, for the manufacture of high class cheese than Wisconsin. No state has so good a dairy school wherein to teach young men the science of cheese making, no state has such a strong and useful Dairymen's Association, or one that does more to lift dairymen out of unprofitable methods into the brighter light of intelligent dairying. No state dairymen's association does so much or spends so much money to help the milk producer and the cheesemaker, as does ours. There is not a more active, vigorous dairy commission in existence, than the present one in this state. It is striving to the limit of human ability to cor-