Well there is just one more thing that I want to say, don't forget these conventions and these tests, these six months tests for instance, take part in them. However we sometimes run across a man who says I don't know the judges ain't exactly square if he don't get the highest scores, he thinks something is wrong, he thinks that the judges have been prejudiced.

Now I want to say to the buttermakers that the judges have no interest in that whatever, they want to help you out the best they can. Why should they want to favor one more than another, no reason why they should. I don't suppose there was ever a time when they knew whose butter they were scoring. I want to say right here there is only one man that can score highest, there may be one or two that may score second highest, but somebody has to score the highest, don't you see. If you have one hundred entries don't score the judges, take part in keeping the good work going. That is all I have to say. Thank you for your kindness.

Music.

OBSERVATIONS AMONG SWEDISH CREAMERIES.

BY RICHARD A. ELLIOT, MADISON, WIS.

I am somewhat afraid that a paper on this subject will not be of a great interest to Wisconsin creamerymen. Advanced and modern creamery methods in countries, in which the butter making industry has become one of importance, must necessarily be more or less similar. Before I proceed to point out some differences between American and Swedish methods I should like to give you a few data regarding the history of the creamery industry in Sweden.

In the beginning of last century milking cows were considered a necessary evil rather than a source of profit. One of the first books dealing exclusively with the manufacture of butter was
published in the year 1802, by a Dr. J. Anderson. He advocated a shallow pan system and a temperature of 50 to 56 F. for the creaming of milk. The cream was not to be removed before the milk was sour and partly coagulated. It is curious to note, that even a hundred years ago a good many things were known regarding the properties of milk. He points out the thinness of the foremilk and the richness of the strappings and also that the milk loses a great deal of its creaming quality if it is not set immediately after it is drawn from the cow. He also mentions that when milk is mixed with water before it is set it will cream more readily, but the quality of the cream will be impaired. He was of the opinion, that butter could not be obtained unless the cream were sour. He says: “If it is attempted to churn cream before it is sour, churning must be continued until the proper degree of ripeness or sourness is obtained or the butter will not come. The dairyman should therefore keep the cream until it is quite thick and sour and it may be kept for several weeks without injuring the quality of the butter.”

He recommends washing the butter, but in other respects his method is extremely crude.

About the year 1840 the Holstein method was introduced, It was practically the shallow setting method, but attempts were made to keep the milk sweet while creaming and it was set in underground cellars, well ventilated and built for that purpose.

About 1846 it was found that good butter could be made from sweet cream.

The shallow pan system with various modifications was used up to between 1860 and 1870 when a method, claimed to be invented by a Mr. Swartz about the year 1864, gradually began to displace the previous methods, namely the ice system. About this time the first large creameries appeared, and from 1870 up to the time when the continuous separate was invented, the deep setting, or, as it was called, the ice system, was used
exclusively. In 1887 Dr. de Laval of Stockholm solved the problem of a continual separation of cream and from that time the creamery industry has grown by leaps and bounds, greatly aided by liberal government appropriations for instruction as well as by a great activity on the part of the different experiment stations in Denmark and Sweden.

Creameries, in a modern sense, did not exist in the country until about 1870. Between 1850 and 1860 attempts had been made to establish so called village or district creameries. They were a kind of proprietary creameries, but as the ice and deep setting systems were not known then, the product was of a very inferior quality, and these creameries often were shut down for want of support, as the farmers could do about as well with the cream by handling it at home.

Therefore these creameries disappeared, and after the introduction of the cold setting system creameries operated by companies or private owners came into existence. Cooperative creameries were started between 1885 and 1890 and have increased in number every year since then, while the number of proprietary creameries is decreasing year by year.

With regard to the character of the creamery buildings in Sweden I may say, that they are without exception built of stone or brick. They would never think of erecting a frame building with wooden floors for a creamery over there. The buildings are stone and brick throughout, the outside walls often being very thick. The partitions between the different rooms are also of brick and stone. Cement floors are seldom seen; flat, smooth, square or rectangular stone slabs with cemented joints being generally used.

The engine and boiler room is of course separated from the making rooms. There is generally a tendency to divide the building into several separate rooms for the different processes and stages of manufacture. Thus you will generally find a separator and intake room, also separate rooms for churning, ripening cream, working butter, etc.
The Alpha Laval separator is almost exclusively used throughout the country.

The separating temperature used to range between 84 and 100 F. and the De Laval people used to recommend this temperature as giving the best results with their machine. Later we have learned, however, that a more effective separation may be obtained at a somewhat higher temperature up to 150 F but this pasteurizes the milk and is not generally used. The skim milk from the separator flows into a tank, from where it is pumped into the cheese vats in another part of the building to be made up into skim milk cheese, or, if intended to be used as food, it is pumped into a pasteurizing machine, pasteurized and quickly cooled down. The pasteurizing apparatus for both cream and skim milk are of the continuous type. The cream is supposed to be retained in the pasteurizer for 20 minutes. The capacity of the pasteurizer is of course adjusted to the quantity of the cream handled at the creamery so that the cream is pasteurized, cooled down and ready to be warmed up to ripening temperature shortly after separating is over.

Practically all high grade butter intended for the British markets is made from pasteurized cream. I do not think that you will find a single creameryman there who does not believe in pasteurizing. Although not enforced by law in Sweden as it is in Denmark, it is nevertheless general as they have found out that it pays. The pasteurizing temperature is generally in the neighborhood of 185 F., which would seem to us here to be unnecessarily high. To enable them to use such a high temperature, they cool the cream rapidly to a very low temperature, preferably below 40 F. I have sometimes found butter over there to have a cooked flavor, caused by a high pasteurizing temperature especially when the cream was not cooled down rapidly to a low temperature. A slight cooked flavor, however, is not considered to be a very serious fault and will often disappear after a few days. It is claimed that a high pasteurizing temperature and a rapid and thorough cooling will effectively
remove some objectionable flavors from the cream, especially feed taints.

When the cream is all pasteurized and in the cream vat it has generally a temperature of 45 F. and must therefore be warmed somewhat before culture is added. The Swedish method of ripening cream differs considerably from the American method. They believe in a low ripening temperature, a small per cent. of starter and give the cream 18 to 20 hours to ripen. I do not know that this method is to be preferred to the one practiced here, viz.: a high temperature, 10 to 20 per cent. of starter and 4 to 5 hours for ripening. There has been considerable controversy regarding the two methods in Sweden and personally I think that the American method is a handier one. It is claimed, however, that by ripening at a low temperature a better body in the butter is obtained, but probably there is not much in it as just about as good butter is made here by the American method.

The churn used in Swedish creameries is the Holstein churn, which would no doubt seem antiquated to an American. It is stationary, barrel shaped, somewhat wider at the top than at the bottom and has an upright revolving dasher. When churned, the butter is taken out with sieves and washed in a barrel or vat containing pure, cold water. It is then put into a trough and allowed to drain. The combined churn is beginning to come in now, however, and will no doubt in time displace the Holstein churn in most of the large creameries.

A worker similar to the Mason is used and the butter is generally salted on the worker. When it is partly worked it is taken out and placed in ice boxes and left for about two hours. It is then finished on the worker and packed. Swedish and Danish butter is packed in casks made of beach holding about 112 pounds each.

The butter is never stored or held at the creamery but is shipped to the buyer at least once a week so that it reaches the British market when it is about 10 days old. An ordinary ice-cooled room will therefore give all the refrigeration that is
needed because the summers are not as hot as they are here, and, owing to the substantial character of the buildings and the material employed, the rooms never get very warm. The windows are whitewashed in the summer and this helps to keep the rooms cool.

There is considerably more help employed in a creamery over there than here and consequently everybody has ample time to do his work well. Except in the smallest creamerries there is an engineer to attend to engine and boiler. He generally cleans and puts the separators together also, but does not run them. As a rule the manager does not do much hard work round a creamery. He sees that everybody is doing his share of the work properly, attends to the ripening of the cream, bookkeeping, etc.

The farmers generally take pretty good care of the milk, especially in dairy sections and the milk is in most cases delivered every day, Sundays included. It is to be hoped that this custom will be abolished when the farmers have learned the simple art of caring for their milk. The milk cans hold about 12 gallons (50 litres) and in a good many creamerries they are washed in soda solution every time, rinsed and steamed before they are returned. The milk is generally drawn to the creamerries in loads.

In some co-operative creamerries the skim milk is returned to the patrons, but in most cases it is made up into skim milk cheese, for which there is a great demand.

With regard to the basis of paying for the milk I regret to have to say, that the old pooling system in many places still prevails, at least it did four years ago. The De Laval Lactocrite was found to be too complicated and difficult to manipulate. The butyrometer, which was invented over there somewhat later, is simpler and is used in a few places. A few creamerries use the Gerber test. Where the pooling system is practiced in a co-operative creamery, the profits are divided according to the quantity of milk each shareholder sends to the creamery.
The creameries vary considerably in size. There are quite a number of small creameries although most of these are very well equipped. There is, however, a strong tendency towards centralization and combination of smaller plants into larger establishments. This has long been advocated by dairy authorities and the number of large central creameries is increasing.

When God divided the waters from the dry land he appears to have forgotten Sweden. At least that is the explanation given by some of the fact that about one-tenth of the entire area of Sweden is water. All over the country are innumerable rivers and creeks and thousands of lakes, large and small, ranging in area from 2,400 square miles to half an acre. In such a well watered country it is evident, that little difficulty is experienced in finding suitable locations for creameries with regard to water supply and drainage facilities.

There are a number of well equipped dairy schools in the country maintained by the government. They have a 12 months’ course and a certain standard of education is required for entrance as well as one year’s practical experience in creamery work.

Home dairying or butter making on the farm is not taught in any of the dairy schools nor is it at all encouraged. It is generally recognized, that the factory system is the only right one and wherever there is a creamery the farmers support it. Farm butter making in creamery sections is condemned, and justly so, as it is estimated that the country would lose between 5 and 10 cents for every pound of butter made on the farm.

The hand separator has not gained much ground in Sweden, and there is no likelihood of its doing so for a long time to come, as the present system is giving good satisfaction.

The country is divided into 25 dairy districts and the government maintains a competent instructor and inspector in each. It is his duty to go wherever his services are demanded within his district at a very small cost to the party who needs him. The De Laval separator company also maintains a dairy expert
who is constantly on the road and ready to give his assistance to any buttermaker in trouble, and the importance of instruction by competent men in the different branches of dairying is well recognized as well as admirably cared for.

Music.

The President then announced that the next speaker, Mr. R. C. Cook, was reported sick, so that this concluded the program for this evening. Meeting adjourned until tomorrow morning at 9 o’clock.

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Waukesha, Wis., Feb. 26, 1903.

Convention called to order by the President at 9 o’clock A. M. and the following proceedings were had.

Music.

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CREAMERY BUILDING AND DRAINAGE.

By Prof. Oscar Erf, of Illinois.

Creamery Building.

The keen competition in modern buttermaking necessitates systematized work. The minor details closely allied, in this vocation, must be taken into consideration in order to lessen the cost of manufacturing butter and at the same time to produce an improved article. To do this we must look for the most improved and economical methods, take advantage of all natural means, locate judiciously, manage affairs on business principles, and look for more convenient arrangements. The latter is the easiest to obtain and yet in glancing over the different factories that are in existence at the present time, we find this point sadly neglected. There is a need for better creamery buildings.