Mr. Noyes: In addition to that leave your books open where farmers can see them and explain to them.

GIFT FROM S. A. COOK.

The Chairman: I have a letter with a surprise in it from the Hon. S. A. Cook:

"Having in mind that it is possible the members, and especially the active ones, the officers, are having difficulties and hard work to make the convention this year just what it ought to be or just what such a representative association is entitled to, that the time to assist is when needed, the time when assistance does some good, permit me to suggest through you to the secretary, the chairs and also the enclosed check ($100) which I ask you to please present to the association with my best wishes to all; and if it will be just a little incentive to encourage the keeping up of the good name of Wisconsin cheese that I, with many others, have reason to be proud of, and also if possible to encourage the cheese makers to see that the farmers, the producers of the milk for the manufacture of cheese, that in keeping up the quality they may also plan to increase the quantity of the product without materially increasing the cost, thereby increasing their net income and at the same time reach the consumer at a reasonable price to them as an article of food. If some good can be accomplished on these lines I will feel well paid for any little assistance I may see my way clear to render. Yours truly,

S. A. COOK."

On motion of Mr. Noyes, the thanks of the association were given to Mr. Cook, and also to Mr. Bruhn for his efficient and faithful work for the association; and the association voted to purchase a chair like one of those given by Mr. Cook as a present to Mr. and Mrs. Bruhn.

REVIEW OF SIX YEARS OF SCORING EXHIBITION WORK.

Prof. C. E. Lee, College of Agriculture, University of Wisconsin.

In the spring of 1907 the scoring exhibition work conducted by the Dairy and Food Commission was taken over by the Dairy Department, College of Agriculture. The plan of the exhibitions, as outlined in the first letter sent to all of the creameries and cheese factories of Wisconsin, has not been changed.

The factory operators were given an opportunity to send a package of butter or cheese to the dairy department each month during the year for the purpose of having the quality judged. The men were also informed that a determination of the per cent of water in each entry would be made and that a letter of advice would be sent to each exhibitor informing them of the probable cause and the remedy for the defects found in the cheese. Each exhibit would be sold and the money refunded to the maker. At that time a plan was also suggested for granting awards to exhibitors at the end of the year.

Great Benefit Derived from Method Blanks.

During the first week of each month, a “call envelope” containing a method blank and shipping instructions, has been sent to the men who for the recent past months entered a cheese at Madison. These blanks when properly filled out are very useful to the men that make the cheese, because they furnish to those in charge of the exhibitions, helpful information as to why certain defects are noticeable to the judges. They are used in writing the letters to the exhibitors and in tabulating data for
the exhibitors' articles that have appeared each month in the dairy and agricultural press. These method blanks are useful to the factory operators. It has taught a number of them what to observe in each step taken in the manufacture of cheese. It has increased an interest in certain problems that are of vital importance to the dairy industry. For example, the one question, What is your score on this cheese?, has been the means of educating the makers how to score their product. In this respect the creamery operators have the advantage because the flavor of their product, while still in the churn, is invariably a true indication of what it will be one or two weeks later, while the cheese maker may not know the day their product is made what it will be when examined one month later unless he is guided by the condition of the milk.

Butter and Cheese Exhibitions Have Made Progress.

If based on total number of exhibits of butter and cheese entered at Madison each year, it cannot be said that the cheese industry has been as fully represented as has the butter. Large numbers do not always signify progress. With a decrease in the number of exhibits of cheese from 736 for the first year to 353 for the fifth and 292 for the sixth, it does not indicate the efficiency of this work. For the fifth year the average number of entries was higher than for the four previous years.

Primarily the exhibition work is for the men that are making the lower grade of cheese; consequently they have been urged to enter exhibits regularly during the months that the factory is in operation. It is not to be expected that the number of cheese exhibits should be as large as that of the butter because the latter is more of a summer industry than the former.

Greatest Progress Made.

The men that have entered cheese since May of this year have made greater progress in improving the quality than for any of the previous years.

The average score on all of the cheese made in May was 89.3 with a gradual increase in score each month until average score of 93 was reached for the month of October. This is an increase in quality of 3.7 for a season's work. A similar progress has not been made by the creamery operators.

Since May this year twenty men have each entered four or more exhibits, making a total of 98 different lots of cheese for the seven months. The cheese made by these men in May averaged 91.3; June 89.5; July 90.7; August 92.3; September 92.5; October 93.2, and for the November cheese the average score was 91.9. One man received a score in July of 90.83 and 94.33 in October. The score on the first two exhibits this year from one factory was less than 92, with an increase in quality to 95.25 and higher on two of the three last exhibits. The cheese made in one factory has been of very high quality. Only one exhibit out of five scored less than 94. Last year 11 exhibits from this factory averaged 93.42.

A Large Number Have Exhibited Cheese.

During the first six years 480 different men had entered cheese for the scoring at Madison. Several entered only one or two exhibits while others have a large number of scores to their credit. Last year 35 men sent their first exhibit. As a rule those who receive a low score on their first exhibits often fail to continue. The men that have entered a large number of exhibits have made a creditable showing. A Chippewa county man formerly located in Calumet county has entered 58 different exhibits of cheese with an average score of 93.9, while a Sheboygan county cheese
maker stands second with 52 entries with an average score of 93.6. The record made by these two men and others is a credit to the cheese industry of Wisconsin.

The two men already referred to are not working under identical conditions as to factory equipment and milk supply. The Sheboygan county man receives a larger supply of milk in the early spring; hence his cheese is made from milk received daily. His self-heating vat puts him at a disadvantage.

**Seven Years Record of Quality of Cheese Made in Two Factories.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Chippewa Co.</th>
<th>Factory</th>
<th>Sheboygan Co.</th>
<th>Factory</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. Exhibits</td>
<td>Average</td>
<td>No. Exhibits</td>
<td>Average</td>
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<tr>
<td></td>
<td>each month.</td>
<td>Score.</td>
<td>each month.</td>
<td>Score.</td>
</tr>
<tr>
<td>January</td>
<td>1</td>
<td>95.8</td>
<td>1</td>
<td>94.3</td>
</tr>
<tr>
<td>February</td>
<td>1</td>
<td>90.6</td>
<td>2</td>
<td>92.4</td>
</tr>
<tr>
<td>March</td>
<td>2</td>
<td>92.2</td>
<td>4</td>
<td>92.6</td>
</tr>
<tr>
<td>April</td>
<td>5</td>
<td>91.6</td>
<td>5</td>
<td>93.4</td>
</tr>
<tr>
<td>May</td>
<td>7</td>
<td>92.9</td>
<td>6</td>
<td>93.6</td>
</tr>
<tr>
<td>June</td>
<td>7</td>
<td>92.7</td>
<td>7</td>
<td>92.3</td>
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<tr>
<td>July</td>
<td>7</td>
<td>93.6</td>
<td>6</td>
<td>94.6</td>
</tr>
<tr>
<td>August</td>
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<td>4</td>
<td>94.0</td>
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<tr>
<td>September</td>
<td>6</td>
<td>93.8</td>
<td>6</td>
<td>94.0</td>
</tr>
<tr>
<td>October</td>
<td>5</td>
<td>94.0</td>
<td>7</td>
<td>94.6</td>
</tr>
<tr>
<td>November</td>
<td>6</td>
<td>94.3</td>
<td>3</td>
<td>93.0</td>
</tr>
<tr>
<td>December</td>
<td>3</td>
<td>94.9</td>
<td>1</td>
<td>95.0</td>
</tr>
</tbody>
</table>

**Average score:** 93.9

**Condition of Milk Influences Quality of Cheese.**

The quality of the cheese as well as that of the butter is in a measure governed by the condition of the milk when it is delivered to the factory. This in part accounts for a difference in the grade of cheese that is made in certain localities as compared with others. Although it is not always possible to connect the quality of an individual cheese directly with that of the milk. With proper method of handling, good milk naturally results in cheese of high quality. In the territories where butter and cheese are competing, the creamery industry is detrimental to the quality of the cheese. One exhibitor, when asked why the cheese made in his county was not of higher quality, replied: “If we demand too much of the cheese factory patrons with reference to the quality of the milk, they will patronize the creameries that do not demand frequent deliveries of cream. Too often the quality of the cheese made during the fall and early spring is lowered because the milk is delivered every two days instead of every day.”

This year, according to your secretary, A. T. Bruhn, the quality of November cheese was lower than for the previous months, partly on account of the milk not being delivered daily. The November cheese made from milk delivered daily was 2.62 points higher in quality than was the cheese made from milk delivered every two days. This lowered the average score 1.3 points below that of the October cheese.

One man received a score in May of 91.33 and 94 on a September cheese. A change of location resulted in a cheese of 92.83. From one factory the cheese gradually increased in quality to 93 in September. For October and November he made cheese from milk part of which was two days old, with a score of 91 and 91.5 on the two cheeses. In another factory the cheese made in September and October from milk received daily scored 94 and 94.33 respectively, while the cheese made in November from milk received every two days scored 90.33. The November high scoring cheese was all made from one day old milk. The cheese makers should not sacrifice quality rather than operate the factory daily.
The Value of Starters in Cheese Making.

Every cheese maker should consider the importance of the starter to the quality of the cheese. A clean flavored active starter, next to the quality of the milk, is the factor in making good cheese. The men that have taken an active interest in the scoring exhibition work since May of this year have used a starter to a greater extent than in previous years. According to the method blanks sent to the Dairy Department, only two exhibitors of American cheese (for which a method blank was filled out) was made from milk to which a starter had not been added. This in part may explain why a greater gain has been made this year in the improvement of the exhibition cheese.

The value of using a starter in cheese making is not merely that starter be added to the milk, but the quality of the milk and starter must receive consideration. The amount to use and when it shall be added and the length of time after it is added before setting the milk must be studied. There are a lot of cheese makers that add their starter to the vat when the first lot of milk has been weighed in. This method is alright when cheese is made during the fall and winter months. During the summer, especially when the acidity of the milk is apt to be high, the starter should not be added until nearly all of the milk has been weighed in. No doubt the actual flavor of the starter is more noticeable in fall and winter cheese making than at any other season of the year, primarily because in the milk delivered cold, bacteria are less active, thus giving the starter a greater chance. Good milk and a pure starter are indications of good cheese.

Water Content of American Cheese More Uniform.

For the first six years of the exhibition work, 1,956 exhibits of American cheese, 302 brick, 38 limburger and 16 exhibits of Swiss cheese have been tested for water. The average per cent of water in the 616 different American cheeses tested the first year was 35.5; 454 exhibits for the second year was 35.4 per cent and 35.2 per cent for the 216 exhibits tested the third year with an increase for the next three years until 36.2 was reached for the 181 exhibits tested the sixth year. The average per cent of water in the brick cheese varied from 37.6 per cent the second year to 41.0 per cent for the sixth with an average of 39 per cent for the 301 exhibits tested. The average per cent of water in the 38 exhibits of limburger cheese was 41.3, the highest average being found in the cheese entered the sixth year. The 16 Swiss cheeses contained an average of 35.3 per cent water.

For the first year 16.88 per cent of the American cheese contained over 37 per cent water; for the second, 6.17; third, 10.18 with a gradual increase for the next three years until for the sixth year 41.3 per cent of the cheese contained over 37 per cent of water and 10.6 per cent of the cheese contained less than 34 per cent water.

For the three year period, beginning May, 1909, and ending, April, 1912, the results for the corresponding months have been very similar. The January cheese always contained the highest average and the August cheese for the last two years, contained the lowest per cent of water. The August cheese in 1909 was not tested for water. For the sixth year, the lowest per cent of water was found in the cheese made during the winter months, with August cheese having the lowest per cent of water for the summer cheese.

In 1909 there was a difference of 3.6 per cent in the average per cent of water found in the January and July cheese, while in 1912 the variation was only 2.5 per cent. For the 11 months aside from August in 1912, the variation in the per cent of water for each month was 1.3 per cent. For six of the months the average per cent of water varied from 36 to 36.6 per cent, and for the other five, February and April to August, the monthly average was 35.3 to 35.8 per cent.
There may be several factors that influence the per cent of water in the American cheese with the exception of the last year the cheese made during the winter months averaged higher in per cent of water than the cheese made during the summer months. According to A. T. Bruhn the influencing factors may be enumerated as follows:

First: In winter the weather is cold and this enables the factory operator to regulate the temperature of the curing room at a point where, even if the water content of the cheese is rather high, it will not produce a soft appearing cheese.

Second: In a cold curing room the fermentation, or the curing of the cheese, takes place very slowly enabling the maker to sell his products before any ill effects are noticeable.

Third: During the winter months when the temperature is low the bacteria in the milk are in a dormant state and unless a large amount of starter is used the development of acid during the process of making the cheese will be very slow. This will tend to hold the water in the curd unless some precautions are taken to reduce it.

Fourth: The feed may indirectly bear some relation to the water content of the cheese. For example, in August, 1910, the per cent of water in the cheese was very low, produced in part by the condition of the feed and the weather. That year the latter part of June, July and early August was exceptionally dry, resulting in very short pasture in August. If the farmers supplying milk to cheese factories would supply succulent food for the cows during August, or when the pastures are short, and proper curing rooms provided at the factory, it would result in the making of cheese having a trifle higher water content.

Per Cent of Water in the Brick Cheese.

The 46 exhibits of brick cheese entered for scoring during the year May, 1908, to April, 1909, contained 37.6 per cent water. This is the lowest average for any one year. Two years later the average per cent of water for 36 entries was 40. The 61 exhibits scored the last year and the 41 for the third year contained the same average per cent water, namely, 39.5. There was a range of from 28 to 41 per cent in the water content of the American cheese as compared with a range of from 32 to 47 per cent in the brick cheese; 17 per cent of the cheese entered the first five years contained between 39 and 40 per cent water. The cheese for four years made in January contained the highest average per cent, namely 42.4 per cent, and the lowest 35.6 per cent in August. Only a small per cent of the brick cheese factory operators have taken an active interest in the exhibitions but from the data collected with reference to the water content of the brick cheese, it can be used as a true indicator of that type of cheese as made in the three brick cheese districts of Wisconsin, namely, the Northwestern, Eastern and Southern portions of the state.

In the opinion of G. Marty of the dairy department, he further stated that a large per cent of the brick cheese factories located in the northern and southern parts, begin operation early in May or the latter part of April. At that time of the year there is always a good demand for cheese, consequently a soft product is made. Later in the season when there is a decreased demand for cheese and the weather is warmer, the makers change the method of manufacture, namely, heating and firming the curd more, than earlier in the season. This firming of the curd is gradually increased until the cold weather of September.

The temperature employed in May varies from 102 to 106 degrees F., and the time from cutting to dipping varies from 20 to 60 minutes, while in July and August the heating temperature varies between 114 to 120 degrees and the time from cutting and dipping varies from 20 to 40 minutes.

After August they gradually change the method of making until it is the same as that employed in the early spring. For every year the per
cent of water in the cheese is the natural result of the method of manufacture. Very few brick cheese factory operators use an acid test. This is the main reason why there is a greater variation in the water content and the method of making as compared with that of the American cheese.

If the makers of brick cheese would depend upon the acid test and the use of a commercial starter especially in the making of cheese during the winter months, there would be less whey-soaked, sour cheese in the market.

**Discussion.**

Mr. Fowler: Why do they put such a high color in cheese in Wisconsin?

Prof. Lee: Why is it that the light colored cheese sold in our groceries is not sold as Wisconsin cheese? If it had a high color in it, it would be sold as Wisconsin cheese.

Mr. Williman: Not long ago I was in a grocery, and there was New York cheese on the knife, and I said, “Why not use our own cheese?” and the grocery man convinced me in this way. He says, “I have got to have it for the customers. We can’t use Wisconsin cheese.” “All right,” I said, “when you give your order ask for aged cheese.” We should see that we manufacture what people want.

Prof. Lee: Last fall when I was in Waterloo, Iowa, at a convention, a wholesale dealer in Iowa came to Waterloo, having heard that I came from Wisconsin. What he wanted to know is this. Can you put me in touch with a cheese maker in Wisconsin that will supply me with several carloads of white cheese. The people of Iowa want light cheese. In other words, they want New York cheese. Are the cheese makers of Wisconsin catering to the trade?

Mr. Ubbelohde: I have had several letters this summer from dealers in New York. This summer is the first that Wisconsin has shipped cheese to New York in carloads, and the fault they find with this cheese is that it is not of uniform color. The New York market demands light colored cheese. A good many makers in Wisconsin have no definite object in putting in so much color. A great many of our factories color their cheese because they have got in the habit. Except in some of the Southern states, they want a lighter colored cheese than we make, and they want a uniform color. If you use the same amount of color, and use a high standard color, we can get it uniform.

Member: Some of our cheese buyers want a high colored cheese.

A. D. Delana, Sheboygan: The assertion is made that if the cows were to have more succulent feed in August, the presence of moisture would be more. I question that. I think that the reason of the moisture is in the manufacture rather than in the feed. You want to get too big a yield, too much moisture in the cheese. You do it by pressing the cheese before it is ready. After you get the whey off the cheese, the main part of the cheese maker’s skill is then to be shown. Mat that cheese frequently and you can keep the moisture of that cheese just as you want to. Furthermore, after taking your cheese from the press and putting it in boxes after one day and then paraffining it, you have retained all the moisture possible, and a moisture that isn’t going to help you, but a moisture that is going to help injure the rinds of the cheese. A cheese should not be paraffined for three or four days after it is taken from the hooks, but many paraffin even the same day, and put them in boxes. The surplus moisture on the outside is still there, and you are not having as good results as you would if you held the cheese four or six days before paraffining. When you say more succulent feed will cause a larger percentage of moisture in cheese, you are talking something you don’t know about, I think.

Mr. Delana: How much do you think is the right amount of moisture in cheese? 36 or 37 per cent?

Secretary Bruhn: That depends on a good many things. I contend that there is too much moisture in our cheese. I agree with Mr. Delana in this respect.