"What are you going to do?" He said "I am going to make cheese," I said "Don't you believe you are." Mr. Newman, a competitor of mine, can probably tell you where that factory was and where that man is to-day. That fellow would not turn out cheese that would bring within seven or eight cents of the market. Would we pay him as much for his sour cheese, his pinholey cheese as we would the man with the high quality cheese?

ITEMS OF INTEREST TO CHEESE MAKERS.

MR. T. A. UBBELOHDE, GLENBEULAH, WISCONSIN.
Editor, Practical Cheese Making Department of the Dairy Record.

Mr. Chairman, Gentlemen of the Convention: My subject is "Items of Interest." I will tell you first what I learned other people thought of us as Wisconsin cheese makers and dairymen and then I will tell you about some things that I found in this state among the cheese makers and cheese dealers. From outside this state we are looked at now as the cheese state. We produce more cheese and better cheese than any other state. I believe our cheese grades higher than that of any other country except, perhaps, Canada. I think Canada perhaps produces less poor cheese than we do.

Then our experiment station at the dairy school is held as the institution. I occasionally get letters from all parts of the country inquiring about our dairy school, letters from young men who want to go there. Wisconsin is an authority. It is not so long ago that Europe imported the art of cheese making to this country, while to-day we have young men come from Europe to Wisconsin to study the cheese problem. I met a young man last summer who came from South Africa to investigate our cheese manufacturing methods here, as well as our farming methods. He is going to spend three years in this country.

While we produce a great deal of fine cheese we also produce some poor cheese but it is just the same with our dairy-
ing. We have some of the best cows in the world, there is not a country in the world that has cows with the record of some of the Wisconsin cows. Not long ago we imported cows from Europe because we did not have them, now we have developed them and are ahead of all the other countries,—Mexico, South American countries, and Japan come here and buy carload after carload of Wisconsin cows and horses. But right alongside of those fine cows I have found in the country herds that would go less than 20 pounds to the cow right through the herd, scrub herds that should not be called dairy cows at all. Our experiment station cannot reach all the farmers that keep those cows. It is the duty of the cheese makers when the farmers come to the factory to develop them. I know of one locality where cows in one herd give 60 pounds of milk right through the herd, and where there are other herds giving 20 pounds per cow. Right up in our county, in Sheboygan county, we have some good cows on every farm from the best producers in the world. We have some good cheese up there too. We have one cheese maker in Sheboygan county that collected all the honors in the country last year, but Sheboygan county does not turn out all good cheese. I have tried cheese in the warehouse at Plymouth. Every once in a while I would find a cheese ten days old with an old stale flavor. I have tried some cheese there, gone back two or three weeks afterwards, and that flavor would be a great deal more pronounced. This flavor is frequently caused by the whey standing in the whey tanks so long that it gets stale, and then we get the flavor in the cans. I have opened milk cans in the morning and smelled the old whey flavor right in the cans. If the whey were sterilized that would not happen. Then another reason for this is the starter got too old and wheyed off, which will give the same flavor. I do not think the dealers pay the same price for this kind of cheese.

Another trouble with some of the cheese is not sufficient time to firm the curd in the American cheese. Some of our factories take in milk at from 9:30 to 11 o'clock in the morning and try to make cheese that same day, but it cannot be done unless they work after dark. I have seen factories take in milk at 9:30 in the morning and the cheese maker be ready to leave the factory at 3 o'clock in the afternoon, had everything finished up. The milk has to have a certain amount of
PLATE NO. 4—A SERIES OF PLUGS FROM SWISS CHEESES OF DIFFERENT QUALITY.

Nos. 1, 2, 3 would be classed as No. 1 cheese, though 2 has rather too many holes. Nos. 4 and 5 show the cracks of a glassier and the corresponding pasty appearance. No. 6 at the upper end indicates a glassier, though a typical glassier would have the small holes the entire length of the plug. No. 7 is what would be termed a blind cheese as there are no "eyes" or holes.
acid and if it does not have it, it will go off flavor. We do not need acid in the winter time but it will not have flavor unless a certain amount of acid develops, and unless you have the acid in the early process you cannot expel whey enough to get it dry and the dealers do not want water. You will get a big yield but you will be cut on the price, so you will lose money in the end every time.

I tried some cheeses last week that were seven or eight days old. They looked fairly good; the texture did not show any acid but you could not work the curd under the thumb at all. I tried some like that two months ago and tried it again the other day and it tasted sour. The cheese was not worth within three cents a pound the price of good cheese.

Out in Minnesota the cheese makers have not the same opportunity to make cheese that we have, because if you criticize the farmers out there they will put in a hand separator and ship their cream to the centralizers, while in this state the cheese makers have some chance to bring the farmers to their standard. The farmers in Minnesota own the factories and some of the farmers out there who owned stock in a certain factory took their milk somewhere else because the cheese makers found fault with the milk. In our state they have to go to the cheese factory and if every cheese maker insisted on good milk we would soon bring the farmers around to the point where they would produce good milk.

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DISCUSSION.

Mr. Kalk: How long do you think it should take to make a good cheese, from time of setting until it is in the hoop?

Mr. Ubbelohde: It should take from twenty to thirty-five minutes for the milk to coagulate; then you need two and a half hours to get a well firmed curd. If you rush the curd you will not get as good a yield as if it is given plenty of time to firm slowly, but in some localities it takes longer to firm it than in others. Then you have to give it time to mat afterwards. Do not hurry it if you want a good flavor. Then you want to have it mellow down. The time that this will require will vary with the season of the year, but it is neces-
sary to give it from one to one and a half hours to mellow before you salt it.

Member: Does the amount of rennet acid used have any bearing on the time it will take?

Mr. Ubbolehde: You should have only about \( \frac{1}{8} \)th of an inch, or a little more, to get the best cheese, about that much acid in the test.

Member: I am referring to a rennet test. How ripe should the milk be to set?

Mr. Ubbolehde: We find a variation in those tests. We have had the best success in setting our milk when the acid test has shown about 18/100ths. That may be 2\( \frac{1}{2} \) or 3 by the Marschall test. With the acid test it does not make any difference what the temperature of the milk is.

Mr. Fred Marty: You referred to 2 to 2\( \frac{1}{2} \). If you have over-ripe milk what will you do?

Mr. Ubbolehde: I was speaking of normal milk. If your milk is overripe of course you have to do everything to get it out in time so that the curd is firm by the time it shows the acid in the whey, because if you run too much acid in the whey you will have a sour cheese. I have spoken of normal milk; I do not think we should take overripe milk very often. It is a very easy matter, if you are using the acid test, to have every thing ready, then take a sample of the milk if you think it is overripe. Just draw out enough milk, have your neutralizer and indicator in the cup and drop in your milk. If it shows pink it is all right. If it remains white you can tell in a moment and in that way refuse overripe milk. I would not take it in if it showed over 2/10ths.

Mr. G. Marty: Has not the condition of the milk as much to do as acidity in milk?

Mr. Ubbolehde: Sometimes you cannot tell about pinholes. They have to be pretty bad to discover them. Sometimes we cannot tell they are there until we make up the cheese and they show up the next morning, but as far as gassy fermentation is concerned your milk will work slower, but the acid test will indicate whether your milk is overripe or not. I prefer the acid test because the cheese maker can take a sample right away and know how ripe the milk is and work accordingly. If there is yeast fermentation in the
milk it will not ripen as fast. The acidity will not develop as fast in that milk as milk free from yeast fermentation.

Mr. Damrow: Do I understand you to say that you would not take milk with more than 2/10th% acidity, or if you take milk with that acidity will it work two hours from setting to dipping?

Mr. Ubbelohde: If you get much of that milk it will be ready to dip before that.

Mr. Damrow: What would be the result if one added the starter and take in such milk? Do you think it would be possible to overcome that ripening in say from 500 to 600 pounds of milk?

Mr. Ubbelohde: If you took in that milk and added the starter, expecting your milk would average about 17/100ths acidity, then took in 500 pounds of milk showing 20/100ths% acidity, that milk is fairly under way where it will rush things along and that is where the trouble will be. You have to hurry it along so fast that you will injure your yield, your cheese and everything. Just as soon as you rush cheese along you are bound to ruin the yield. It may have more water in the start but if you hurry it along you will injure the yield.

Member: How much starter do you advocate using?

Mr. Ubbelohde: That would depend on the condition of the milk and the locality. In some localities milk will work faster than in others. In some factories I have seen 1% of starter used while in other factories ¼ of 1% was enough. The only safe way is to start with a small percentage and then gradually increase it until you are on the safe side. It is better to go slowly with the starter than to overdo it. If the starter gets ahead of you you will lose entire control of it so you cannot mat your curd, and you would have to dry it right off and salt it. Consequently the right way is to start in with a little starter and add a little more as you go along. Each cheese maker will have to decide that for himself.

Member: Do you use the same acidity the year round, that is 18/100ths%? If not, why not?

Mr. Ubbelohde: No sir, we do not, because there are times that milk will work more slowly. In the fall when the milk has got near the freezing point all the lactic acid germs in the milk are gradually destroyed, and then we depend en-
tirely on the starter. It is necessary to run a little more acid before it is set in order to have it come right along. We find sometimes in the spring, when the cows have freshened, that the acid will develop faster than in the fall. You cannot lay down a cast iron rule for that, every factory has to decide that for itself.

Mr. G. Marty: By looking over the entry blanks at Madison we find the cheese makers, in response to the question as to what condition the milk arrives in, that say "The milk was old in flavor" received a higher score than those that simply said the milk was good, and that shows a number of cheese makers in the state know the condition of the milk before they add the rennet. The main thing is to be careful at the intake as the tainted milk causes more trouble than does all the overripe milk.

Mr. Ubbelohde: I understand in talking to the cheese dealers, that the greatest amount of poor cheese in our country comes from the cheese dealers who stay home. Some cheese factories send their cheese to the dealers, do not put it on the board; the cheese makers never come down here, never go to a Farmers' Institute, and those are the ones that the dealers tell me send the poor cheese, while the cheese makers attending these meetings have comparatively little trouble. When we come together and talk with one another we receive mutual benefit. One of the reasons we are having so much trouble here in Wisconsin is because those fellows stay at home. They are doing all they can to injure the other cheese makers.

Mr. Damrow: I think we ought to get together and make all the cheese makers sell on the open board. If we sell our cheese on the local board the dealers are willing to come there and buy the cheese. It is up to us to educate the farmer.