the end, and then with this rubber syringe that will hold just four ounces, we have just enough for each teat, and that four ounces is injected into each teat; it is absorbed, the poison potomaine is killed and the cow gets well. It should be blood heat. Another thing you must remember, and that is to dip this milking tube into boiling water first, then into this iodine preparation before you use it. Use soft water, and it should be thoroughly boiled.

Mr. Convey—Isn’t it necessary to draw off the milk first?

Mr. Cook—Yes, draw the milk out first. In suggesting this, I am giving you what has proved to be very satisfactory. In my own case I have not had a case which resulted badly since I knew of this remedy, and I know of many cases that have been cured in our own country.

THE SILO AND SILAGE UP-TO-DATE.

W. F. STILES, Lake Mills, Wis.

Mr. Chairman, Ladies and Gentlemen:—I know that you are all disappointed to know that Prof. King is not here to talk on this subject, but I am sure no one is more disappointed than myself.

Succulence for Stock.

I can safely say that from now on until the 15th of May all who have silos will be glad to say they have silage up to date. It is one of the best feeds that we can have in the winter to feed to all classes of stock. In his address on the dairy cow, Mr. Cook spoke of the necessity of supplying the dairy cow with a certain amount of succulence in the feed which she consumes. He has spoken of the ideal condition of the dairy cow in the summer, and said that in the winter we could have just as ideal a condition, perhaps better. In the summer we all know that the cow has a large amount of succulent feed. Of course grass is one of the best feeds the cow can have, because it contains a large amount of succulence, which makes it easily digestible. We know in the winter that if we do not grow roots nor have a silo, we have to go through a long period of feeding where we have very little succulence in the feed; hay, with all the various kinds of grain feed that we produce, is dry, and where the cow has to live upon these for five or six months, it is easy to see why she cannot do nearly as well as she can in the summer when she has a large amount of succulent feed. If we grow roots, we have supplemented the dry feed in a certain measure, but the growing of roots at the present time is too expensive. We can raise corn cheaper and this will furnish us a succulent feed if utilized through the silo. The corn crop is one of the best that we can raise. We know we often have dry weather in the summer, but it doesn’t make very much difference to us how dry the season is, we can almost always get a corn crop, and if we utilize this crop through the silo, then we have a cheap, succulent feed for the cows and all classes of stock in the winter.

I am sorry Prof. King is not here to give you the best modes of constructing silos. He has visited them all over the country and is eminently fitted to take up and discuss the silo question, I think he has done more work on those lines than any other one man. I know how well all the farmers like to have him visit their silos. One time he was visiting the silos in my own section at a very busy time of the year, and one man said, “I am sorry I have so much work to do; I wish I could sit and visit with that man.” He knew some mistakes he had made and he wished he could sit and talk with Prof. King and find out better ways of filling his silo, and constructing it so that the silage would keep.

Form and Material for Silo.

The silo is not a new thing with us in Wisconsin. We have been building them for twenty years, and the last
few years we are building more than ever before, as you can see all over the State. A map showing all the silos would show that they can be found in nearly all sections of the State; in my own section we have a silo on pretty nearly every farm. When we first began twenty years ago we made several mistakes in the construc-

tion of silos; we didn't know much about the keeping qualities of ensilage, and many cheap buildings were put up. Many men who advocated building silos said it didn't make much difference what kind of a silo was built, but so much ensilage was spoiled that we found out that cheap

buildings were no good. Our own Experiment Station took up the subject, Prof. King took charge of the work, and made a careful investigation of the entire subject. Experience has taught that in square and rectangular shapes the pressure will spread the walls unless they are very strong, and in the corners there will be more or

less spoiled ensilage. Prof. King found out that the building must be built with rigid walls, and the ensilage must be put in properly. As to shape, the cylindrical form is the best.

With regard to the best material out of which to build a silo, that will depend upon the relative cost of wood,

VIEW OF MODERN SILO.
stone, brick and cement. The silos that have been built in my own locality are partly of stone and partly wood. In some localities they are built entirely of stone, in some places entirely of wood. I think in many places to build them partly of stone and partly of wood will be the best.

Location.

The place where the silo shall be located in regard to your other buildings will also depend upon local circumstances. You ought to have it convenient to where you are going to feed your cattle, and if you can build it so you can dig it down into the ground a certain depth, so much the better, because the deeper we get into the ground the less height we will have to elevate the cut feed in running through the feed cutter. There is one thing we ought to pay special attention to, and that is, to have the proportion right. Have it deep enough so we can feed off a certain amount every day, feeding off the entire surface, and then the feeding period can be extended seven, eight or nine months, and you will have enough in the silo to last that time. If your silo was very large in diameter and very shallow, you would have to feed so fast in order to have good ensilage all the time that you would soon have it all gone. A good shape for a dairy of twenty-five cows and fifteen head of young stock is about eighteen or twenty feet across and about thirty feet deep. I would not advise building a silo any less than twenty-five feet deep because the deeper we get the silo the more ensilage we can get in the same-sized building, as the pressure on the bottom will be so much greater.

Where you are intending to build partly of stone and partly of wood, you can dig down four or six feet below the feeding floor and then build up the stone wall a couple of feet above the surface; in many cases the wall will be fourteen feet high. In building this stone wall, you can use the common hard heads, but be sure and make the wall sufficiently strong, because with a silo thirty feet deep the pressure will be very great upon the stone and there will be a tendency to spring the wall, then the air will enter and spoil your silage. I have known of stone walls two feet thick where the silo was thirty-eight feet in diameter and thirty-eight deep, and it became necessary to put a hoop around the stone wall.

A Stone Silo.

If you are going to build a silo write to Prof. King and get his bulletin on silo construction. He gives plans and specifications with the cost, and all sorts of information, which is very useful. If stone is sufficiently cheap with you, and you wish to build entirely with them, that will be all right. You will have to make doors from time to time, and they should not be more than three feet apart, preferably two feet square. Down at the bottom of the feeding floor there must be a door large enough to admit a man with a basket of silage, but do not think that you commence to feed the silage from the lower door. No, always feed from the top, so the doors are made at intervals of perhaps three feet apart, and we commence at the top to take out the ensilage.

Silo of Stone and Wood.

Now, where you wish to build the upper part of the silo with lumber, as many are built, the largest timbers necessary are 2 by 4s. After the wall is made, it is well cemented up on the inside with Portland cement to make it perfectly smooth and air-tight. If you do not cement it more or less air will pass through the wall. Mix one part of Portland cement to two of sharp sand and cement the inside of the wall good and smooth. Then we set our 2 by 4s on top of this wall. In some cases they put brick inside of the woodwork, and this would make a silo that would last almost indefinitely, but if you are going to do that, you must set these 2 by 4s far enough from the inside surface of the wall, so that when the last course of material is put on the inside of the 2 by 4s it will be flush with the inside of the wall, so there won't be a shoulder or jog back for the air to work into and spoil the silage.

Wooden Silo.

Where you use all lumber, you need to have just two courses of boards on the inside of these 2 by 4s; use com-
mon fencing sawed right through the middle, and make it half an inch thick. Then put on the first course of this fencing, and when you run them around and put it on the 2 by 4s, be sure that you break joints sufficiently so that these boards will act as a hoop, which prevents the building from springing. When you start your second tier of boards you want a board that is just three inches wide and then running on up with boards six inches wide. In that way you break joints. Between the two boards you have specially prepared paper to prevent the air from getting in and spoil the silage.

Inside of Silo.

Some people tar up the inside of the boards; I don't know whether it really pays or not. It has not been tried long enough to prove whether it will be necessary or not. Some, in building, take boards four inches wide, grooved and matched, and put them on the inside of the silo, running up and down. This makes it perfectly smooth, and the silage settles better. On the outside the boards are matched the same as on the inside, only you must be specially careful to turn off the water so it will not run down in and rot the 2 by 4s. If boards are dried and then wet, they will rot sooner than if they are kept dry all the time or wet all the time. On the outside at the bottom there is a hole through the boards between each 2 by 4, and a corresponding series on the inside at the top, so that when the ensilage is removed these can be opened and allow the air to circulate through and keep the lumber dry. Of course, in winter these holes must be closed to prevent the silage from freezing. There is an air space between each one of the 2 by 4s. We don't want our silage to freeze any more than possible, although it does not hurt it a great deal, but it is harder to handle.

I think one reason why silos were not built as much a few years ago as they are now, was because it was pretty hard work to fill. We thought it was necessary to employ a good many extra men, and it made it pretty expensive, but with the corn binder we have it fixed now so that it needs no extra help. This last year I myself with one man filled our silo. It took us about three weeks, but the ensilage came out just as good as when we had a large force of men and filled it in three days. With our corn harvesters we make much easier work of it.

Cutting Silage.

In regard to varieties of corn to plant for the silo, that is an important question. A few years ago I visited about thirty silos in my own locality and examined the ensilage in them, and made inquiries as to the different varieties of corn. I found there was considerable difference. Corn that was cut very green, the ensilage came out very acid, and in one case I found it as sour as pickles. I found that corn was cut just as it was tasselling out. In other silos it had been cut just a little before it was ready to cut for husking, and that ensilage came out much sweeter. I think if we use varieties of corn that will mature in our own localities and cut it just when the ears are beginning to dent and the lower leaves begin to turn, we will find that the ensilage will come out much sweeter. Sour ensilage is not good for our cows.

DISCUSSION.

Mrs. Howie—What do you consider the best kind of corn for ensilage?
Mr. Stiles—The kind that will mature in my own locality. I use either the Yellow Dent or the White Dent. I have used White Cap Yellow Dent, and I like that because it bears a large proportion of leaves.
Mrs. Howie—Do you like Red Cap as a silage corn?
Mr. Stiles—Not as a rule. It is a good thing to have about 10 per cent. of the big varieties; this furnishes a heavyweight on top to press down and keep the rest.
Mrs. Lehmann—How do you like Flint corn?
Mr. Stiles—We have planted Flint corn to some extent, but it does not give us as large an amount of feed as the Dent corn, and with us it is more acid.
Mr. Convey—How far apart do you plant your corn in the row?
Mr. Stiles—I try to plant my corn so as not to have a lot of ears, but I don't want it without any ears at all. I think
it is best to have it about half and half, a little thicker than you would have it for husking corn, and then each stalk will develop an ear that won’t be so very large, but there is the right amount of corn in there; but where we have it planted thin and the ears are large, I think the amount of corn in the feed would be too much, and the cattle may not be able to digest it all.

Mr. Thorp—In going over the State of Wisconsin this winter, I found that in the southern part of the State they value their cornstalks as absolutely nothing. Now, we are told by the experimenters at Madison that about one-third of the feeding value in our corn plant is in the stalk and leaf, and we find the silos are saving lots of waste of the corn fodder. I absolutely believe that in some parts of this State there are cornstalks enough in the fields to winter all the stock there is in the State of Wisconsin. Now, then, if one-third the value was in the stalks, there is certainly a time when the value of the plant is worth more than it is at any other time; there is a time when that corn plant is perfect, when there is just as much feeding value in it as there can possibly be there, and if there is such a time. I think that is the time we ought to save the plant, the whole plant. I mean, not merely the corn, but the whole plant. If we could think of any better way to save it than to put it in the silo. It is surprising to me that there are so any farmers in the State of Wisconsin that are going without silos and letting their corn fodder go to waste when they could keep so much more stock.

I want to say a word about the cost of building silos, because that question of the cost of stone or brick silos is often brought up in Farmers’ Institutes. I built a silo of stone and brick, and I am going to build another of brick entirely, although I have a good many stone on the place, but I find in building a brick silo, that the mason in laying up a brick wall will lay up about three feet of the brick wall while he lays up one foot of the stone wall, and the tender is working with him one day where he would otherwise be working three. With wages at $2.50 or $3.00 a day, that cuts quite a figure in the expense of building a silo, and makes me think that sometimes, even if we have some rock on the place, we might better afford to build a brick silo. Another thing we find in putting up a brick silo, the amount of cement required on the inside of it is a great deal less than on the stone silo, because the wall can be laid up so much more nicely.

In regard to the strength of the silo, I think that the brick silo is stronger than the average stone silo, even with only an eight or nine inch wall. The brick in being laid up are lapped and they form a hoop in themselves, and having the two walls, we will say an inch apart for a dead air space, with headers placed across every two or three feet up and down every fifth brick in the course, will bind that all together. A thousand brick will weigh two tons, and the lime that is required to lay it up will weigh half a ton more. We know that the lateral pressure in a silo is greater near the bottom, so I do not think that we need be at all alarmed about building a brick silo on account of being afraid of its spreading. On a round silo the pressure is equal, alike all around, while in a square silo it is more in the center of the square, and I think with a round brick silo, if a man is afraid to build it up without using any hands, he could put two or three iron bands around it and it would be perfectly safe to put up two-inch walls with dead air space between.

Mr. Scott—When you are building a stone or a brick silo, it is well to have this wall well settled before the silo is filled. I know of a silo built in this county last fall, the lower part is stone; it was built too quickly and there was trouble.

Mr. Convery—We built a stone silo with a two-foot wall for the first eighteen feet; the last seven feet we built immediately. It is built in a square form with round corners.

Mr. Cook—I have a little model of a stave silo, which contains some features that I thought were very good. I will bring it to the meeting this afternoon.

Supt. McKerrow—We do not advocate the building of stave silos a great deal, as they are built here, but we will be glad to see that model.
Question—What do you think of the lathed and plastered silo?
Mr. Stiles—I have not visited any of those silos, although I know quite a number have been made, especially by Mr. Gurler, down in Illinois, who has built quite a number of them. They are a very much cheaper silo, but I think as a rule we will be wise to build a silo that we know will be permanent, because it is a thing we want to have a long time, and always have it good.

Recess to 1:30 p. m.

AFTERNOON SESSION.
The Institute met at 1:30 P. M. Conductor Chas. Thorp in the Chair.

IMPROVEMENT IN WISCONSIN DAIRY METHODS.

C. P. GOODRICH, Ft. Atkinson, Wis.

To fully realize to what extent dairy methods have been improved in Wisconsin it will be necessary to look back and see what methods were practiced in early days.
I have lived in Wisconsin fifty-four years and have had something to do with dairying nearly all the time.
In the old time the cows roamed at will over the prairies, woods and marshes, frequently getting miles from home. The tinkle and clang of cow bells could be heard on all sides. Sometimes the cows came home at night if some old matron of a cow, who wore the bell, had a calf at home which was allowed to nurse her so as to keep her maternal affections alive sufficiently to bring back the mother to her offspring at night with the rest of the herd following.
But frequently the cows failed to appear at night, and the boy, whose business it was to look after them, failed to find them and they had to be looked up the next morning. Such occurrences were not looked upon then as causing any very serious loss. I know, as a boy, I used to think I could stand it if the cows could.

Summer Dairying Practiced.

Cows gave milk quite well for a time while the grass, which was abundant, was fresh and succulent, but when the drought of midsummer and fall caused the herbage to wither and turn brown, the flow of milk fell off or ceased entirely by the time winter set in, and for five or six months not one farmer in ten had any milk for family use.
Cows found shelter around the straw stack in winter, if the farmer had one, and they were fed marsh hay cut in September after it had some “substance to it” which was thrown on the ground or snow. Their water they got by drinking through a hole cut in the ice of a pond or by eating snow.
Occasionally a man built a shed for his cattle, but the old boss cow generally occupied it and kept the rest out. Cows kept in this way usually lived through the winter if the farmer fed the poorest ones a few “nubbins” of corn.

“Winter Cows.”

“Winter dairying” was never practiced. Perhaps one farmer out of ten would have a “winter cow” fresh in the fall, which he, by extra feeding, could keep giving milk enough for family use during the winter.
We knew nothing of balanced rations. We knew that pasture grass was good for milk production and that marsh hay, straw and corn were not, but we did not know why. We had never known of the chemists’ investigations in the line of feeding animals, and therefore could not understand the meaning of such terms as protein and carbohydrates.
But fifty years have wrought a wonderful change. Although some who keep cows still cling partially to these