Fifteenth annual report of the Wisconsin Dairymen's Assocation : held at Sparta, Wis., February 8, 9 and 10, 1887. Report of the proceedings, annual address of the president, and interesting essays re...

Wisconsin Dairymen's Association
Madison, Wis.: Democrat Co., State Printers, 1887

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FIFTEENTH ANNUAL REPORT

OF THE

WISCONSIN

DAIRYMEN'S ASSOCIATION,

HELD AT

SPARTA, WIS., FEBRUARY 8, 9 AND 10, 1887.

REPORT OF THE PROCEEDINGS, ANNUAL ADDRESS OF THE PRESIDENT, AND INTERESTING ESSAYS RELATING TO THE DAIRY INTERESTS.

COMPILED BY

D. W. CURTIS, Secretary.

MADISON, WIS.:
DEMOCRAT CO., STATE PRINTERS
1887.

OFFICE OF THE SECRETARY,
Wisconsin Dairymen's Association.
FORT ATKINSON, MAY 10, 1887.

To His Excellency J. M. RUSK,
Governor of the State of Wisconsin:

I have the honor to submit the Fifteenth Annual Report of the Wisconsin Dairymen's Association, showing the receipts and disbursements the past year, also papers relating to the dairy interest, read at the Annual Convention held at Sparta, Monroe county.

Respectfully submitted,

D. W. CURTIS,
Secretary.

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OFFICERS 1887.

PRESIDENT.

H. C. ADAMS,

MADISON, DANE COUNTY.

VICE-PRESIDENTS.

CHESTER HAZEN, LADOGA, FOND DU LAC COUNTY.

President Wisconsin Dairymen's Association from 1872–4.

HIRAM SMITH, SHEBOYGAN FALLS, SHEBOYGAN COUNTY.

President Wisconsin Dairymen's Association from 1875–6.

A. D. DELAND, SHEBOYGAN FALLS, SHEBOYGAN COUNTY.

President Wisconsin Dairymen's Association, 1877.

H. F. DOUSMAN, WATERVILLE, WAUKESHA COUNTY.

President Wisconsin Dairymen's Association, 1878.

Z. G. SIMMONS, KENOSHA, KENOSHA COUNTY.

President Wisconsin Dairymen's Association, 1879.

STEPHEN FAVILL, DELAVAN, WALWORTH COUNTY.

President Wisconsin Dairymen's Association. 1880.

C. R. BEACH, WHITEWATER, WALWORTH COUNTY.

President Wisconsin Dairymen's Association from 1881–2.

W. H. MORRISON, MADISON, DANE COUNTY.

President Wisconsin Dairymen's Association from 1883–6.

SECRETARY.

D. W. CURTIS,

FORT ATKINSON, JEFFERSON COUNTY.

TREASURER.

H. K. LOOMIS,

SHEBOYGAN FALLS, SHEBOYGAN COUNTY.

ARTICLES OF ASSOCIATION.

[*Adopted February* 15, 1872.]

ARTICLE I. The name of the organization shall be the Wisconsin Dairymen's Association.

ARTICLE II. The officers of this association shall consist of a president, secretary and treasurer.

ARTICLE III. The vice-presidents of the association shall consist of all past presidents.

ARTICLE IV. The presidents, vice-presidents, secretary and treasurer shall constitute the executive board of the association.

ARTICLE V. The officers of the association shall be elected at the annual meeting, and shall retain their office until their successors are chosen.

ARTICLE VI. The regular annual meeting of the association shall occur on the second Tuesday of April in each year, at such place as the executive board shall designate.

ARTICLE VII. Any person may become a member of this association, and be entitled to all its benefits, by the annual payment of one dollar.

ARTICLE VIII. The executive board shall have power to call special meetings whenever and at such places as in their judgment its interests so demand.

ARTICLE IX. The officers of the association shall perform such other duties as usually devolve upon the officers of like associations.

ARTICLE X. The treasurer shall have the custody of all moneys belonging to the association, and authority to pay out the same whenever an order is presented, signed by the president and secretary.

LIST OF MEMBERS FOR 1887.

Arnold, A. A., Galesville.
Ayers, R. B., Sparta.
Ayer, H M., Juneau.
Austin, Henry, Leon.
Austin, W. J., Leon.
Allin, N. E., Beaver Dam.

Bower, Frank, Richland Center.
Bush, W. E., Sparta.
Babcock, A. A., Hillsborough.
Bowen, L. B., Burnes.
Broughton, Z. H., Glendale.
Bartlet, Eagle Point.
Brown, Chas. E., Kenosha.
Barclay, D. F., Elgin, Ill.
Buchanon, E., Johnsburg, Ill.
Boyd, John, Chicago, Ill.
Bush, Miss Nellie, Sparta.

Cheever, D. G., Clinton.
Clapp, I. J., Kenosha.
Carswell, Fred E, Lone Rock.
Cross, J. W., Mauston.
Chandler, Geo. V. Lodi.
Chamberlin, C. V., Sparta.
Cheney, J. R., Glendale.

Davis, M. W., Sparta.
Dudley, W. J., West Salem.
Drowtzky, B., Tomah.
Dunbar, A. W., Sparta.
Dorwin, B. W., Durand.
Dana, M. J., Sparta.
Davidson, James, Sparta.
Dodge, Rufus, Sparta.

Eaton, H. L., Dixon.

Fish, H. Z., Richland Center.
Fish, L., Leon.
Fox, B. F., Leon.
Field, Frank, Mauston.
Freeman, W. B., Sparta.
French, J. J., Sparta.

Gumelius, M., Litchfield, Minn.
Gates, W. B., West Salem.
Gould, John, Aurora, Ohio.
Graham, W. M., Sparta.
Grossman, A., Sparta.

Hubbard, W. M., Oil City.
Hutson, John, Sparta.
Harr, John Sparta.
Hale, Wm., Mauston.
Hoard, W. D., Fort Atkinson.
Hebron, John, Sparta.
Hitchcock, R P., Tomah.
Hubbard, A. T, Trippville.
Hunt, Capt. C. A., Melvina.
Hatch, E. H., Sparta.
Hope, D. C., Sparta.
Hill, Ira A., Sparta.

Jewett, Z. K., Sparta.

Kimball, Orin, Union Center.
Krahenbuhl, Samuel, Malvina.
Kingman, R. S., Sparta.

Lybrand, R. C., Richland Center.
Lovejov, H., West Salem.
Linse, Chas., La Crosse.
Larson, D. O., Colfax.
Loomis, H. K., Sheboygan Falls.

Monrad, H., 17 Dearborn St., Chicago
Moore, H. C., Fond du Lac.
Morse, L. C., Sparta.
Morrow, A. M., Sparta.
Mc Cutchon, H., Sparta.

Newsome, J., Tomah.
Newman, Aug., Union Center.
Newman, H. C., Elroy.
Newton, F. N., Sparta.
Northroup, J. B., Sparta.

Olin, E. E., Sparta.
Olson, Ole, Sparta.

Pheatt, H. D., Milwaukee.

Richards, Thomas, Caterack.
Robison, D C., Mauston.
Russell, W. H., ———

Smith, John W., Sparta.
Spensley James, Mineral Point.
Smith, E. M., Madison.
Shane, D., Burnes.

Smith, G. H., Chicago, Merchants Dispatch.
Stringham, S. R., Sparta.
Simpson, G., Sparta.
Smith, Amcil E., Sparta.
Sechler, J. R., Hixton.
Smith, Hiram, Sheboygan Falls.

Thomas, J. H., Mondovi.
Thomas, J. M., Dixon.
Thayer, M. J., Sparta.
Tripp, F. A., Chicago.
Weeks, J. M., Defroom.
Weeks, H. S., Oconomowoc.
Waite, Elmer, West Salem.
Williams, G. R., Pipersville.

FIFTEENTH ANNUAL MEETING.

OF THE

WISCONSIN DAIRYMEN'S ASSOCIATION

Held at Sparta, Wisconsin, Tuesday, Wednesday, Thursday, February 8, 9 and 10, 1887.

PROGRAMME.

TUESDAY 9 A. M.

Entry of Butter and Cheese, and articles for exhibition.
10:30 — Organization of Convention.
Address of Welcome, by M. A. Thayer, Mayor of Sparta.
Response by Hon. H. C. Adams, Madison.
Opening Address by President Morrison.
Appointment of Committees.
Report of Secretary and Treasurer.

TOPICS.

"The Best and Cheapest Way to Fertilize our Soil," — Hon. Hiram Smith.

Having passed through all the gradations of Wisconsin farming, from wasteful wheat culture to the point of making 200 acres of land support 100 cows, Mr Smith can but have a most valuable experience to relate on this question, vital to every farmer in the State.

"The Necessity of Dairy Education. — A Lesson Drawn from the Last State Census." — W. D. Hoard, President of the N. W. Dairymen's Association, and Editor of HOARD'S DAIRYMAN, Fort Atkinson, Wis.

"How to Feed for Milk, from a Wisconsin Standpoint." — Prof. W. A Henry, Wisconsin Experimental Station, Madison.

As a man of science, sense and stability, Prof. Henry, is the peer of any man in the West. He experiments, thinks and works for the advancement of the average farmer. Be sure and hear him on this important topic.

"Ensilage as a Factor in Modern Dairying." — John Gould, Aurora, Ohio.

Mr. Gould's experience and extensive thought and observation on this question will make what he has to say of great value to all earnest seekers after "more light" in progressive dairying.

"Encouragement for Small Dairy Farmers."—Hon. H. C. Adams, Madison, Wis.

Mr. Adams is justly to be reckoned among the foremost of dairy thinkers and workers in Wisconsin. His thoughts always smack strongly of "knowing how it is himself."

"Pastures For the Dairy, — How to Treat Them."—C. R. Beach, of Whitewater, Wis.

Sage as an adviser, practical as a manager, in a word, successful as a dairyman, Mr. Beach always "makes a close joint" in whatever he says or does.

"Clover as a Fertilizer and Dairy Food."—Stephen Faville, of Delavan.

On this important subject Mr. Faville will present his valuable experience, extending over thirty years in Wisconsin.

"How I Constructed a Permanent Pasture."—John Boyd, Elmhurst, Ill.

Like the cattle he so successfully breeds, Mr Boyd is a native of the Island of Jersey, and justly ranks among the foremost dairy writers of the West.

"How to make Dairy Butter of a Quality Equal to Creamery."—Mrs. E. S. Robertson, Viroqua, Wis.

"Woman's True Mission" is best exemplified, when like Mrs. Robertson, she makes a practical success in life, by making butter that the market calls "gilt-edge."

"Treatment of Sandy Soils in Dairy Farming."—N. E. Allen, Beaver, Dam Wisconsin.

As a purchaser and renovator of sandy lands, Mr. Allen's experience cannot but prove valuable to a great many farmers in Wisconsin.

"Our Experience in the Care and Feeding of Dairy Cows in Northern Illinois."—H. B. Gurler, President of National Butter, Cheese and Egg Association, De Kalb, Ill.

In the person of Mr. Gurler, we have one of the most thorough and intelligent dairymen in the entire West. His contributions to dairy knowledge have always been based on what he has dug out of the stubborn quarry of facts.

"The Cheese Prospects in Wisconsin."—J. A. Smith, Cedarburg, Wis.

Mr. Smith is one of the soundest thinkers in the West, on this and all kindred topics. He will speak as an expert cheese maker, and every factoryman and patron in the State should hear what he has to say.

"Dairying as a Regenerator."—Mrs. H. E. Foster, Sparta, Wis.

Mrs. Foster is one of the brightest writers on dairy matters in the State, and her essay can hardly fail to be of interest to everyone.

"Making and Marketing Butter."—J. W. Smith, Sparta, Wis.

It is quite as important that we know how to sell an article, as it is to know how to make it. Mr. Smith from his experience will be able to

point out just how to make good butter, and how to obtain a good price for it after it is made.

"Pasturage and Grases." — C. A. Hunt, Sparta, Wis.

The importance of this subject, and the ability of Mr. Hunt to relate his own experience, will interest every dairyman.

"Home Thoughts on Farm and Dairy." — Mrs. W. E. Bush, Sparta, Wis.

Mrs. Bush won first premium at last year's Convention, for best essay on making granular butter, which is a significant guarantee that her subject will be treated with ability.

All papers read before the convention will be limited to one thousand words. The zest and profit of the dairy convention lies in the discussions. For these there must be ample time allowed. Hence the necessity for *short practical Papers*. Speakers will address the convention as required, but not in the order named.

Thursday afternoon will be an "experience meeting," or short talks, or papers from practical dairymen from different parts of the State, who have made a success of keeping a dairy. The doubting are invited to be present.

WEDNESDAY EVENING.

Grand Dairy Banquet and Sociable. The banquets of this Associotion have become famous for a flow of wit, song and story.

PREMIUMS OFFERED ON WISCONSIN BUTTER AND CHEESE TO BE EXHIBITED DURING THE CONVENTION.

CLASS I.— PREMIUMS ON BUTTER.

The Association offers the following premiums on butter.

For the best tub or pail of butter	$10 00
For second best	5 00

CLASS II.—PRINT BUTTER.

Best specimen or plate of butter made into fancy prints	5 00
Second best	3 00

CLASS III.—GRANULATED BUTTER.

For the best sample of granulated butter	3 00
Second best	2 00

Granulated butter may be exhibited in fruit jars.

CLASS IV.

For best cheese, cheddar or flat	10 00
Second best	5 00

CLASS V.

Geo. S. Hart & Co., Produce Commission Merchants, 38 Pearl St., New York, offer a prize silver cup, valued at $100, to the manufacturer of the finest quality of full cream cheese.

Competition for same to include all makers of factory cheese complying with the rules of the association.

Prize to be retained by the winner for one year, then to be returned to the association for renewed competition.

The maker who is awarded the cup for three successive seasons to retain the same permanently.

The prize cup is of sterling silver, satin finish, with gold border and lining. Upon one side of it is engraved the figure of a cow, and upon the reverse side an appropriate inscription. This cup is also enclosed in an elegant satin-lined case.

It has been won by A. H. Wheaton, Auroraville, 1878; Olin & Clinton, Waukesha, 1879; W. S. Baker, Cold Spring, 1880; H. A. Congar & Son, Whitewater, 1881; August Klessing, Centreville, 1882; Marr & Dyer, Whitewater, 1883; E. P. Ingalls, Milford, 1884; H. Z. Fish, Richland Center, 1885; and T. P. Fish, Richland Center, 1886.

RULES GOVERNING THE EXHIBITION.

1. Entrance fee to be fifty cents for each.
2. Butter made at any time, and can be in eight pound pails, or what is preferable, twenty pound tubs, except in classes 2 and 3.
3. Butter in *Stone Jars* not allowed to compete for premiums.
4. No package can compete for more than one premium.
5. Scale of points for judging cheese: Flavor, 30; quality 30; texture, 20; salting, 10; color 10. Total. 100.
6. Scale of points for judging butter: Flavor, 40; grain, 30; salting, 10; color, 15; style of package, 5. Total 100.

Manufacturers, Dealers and Inventors, are invited to make an exhibit of Dairy Goods in which they are interested. A Committee will be appointed to examine and report upon the same.

Parties wanting Cheese or Butter Makers for next season, and those wishing situations, will find Books for Registry, that the wants of each may be known.

Sparta can be reached either by the C. & N. W. Ry., or the C. M. & St. P. Ry. It has ample Hotel accommodations.

As the Convention promises to be well attended, parties desiring to secure lodgings or hotel accomodations, should address M. A. Thayer Sparta, Wis.

Members paying full fare one way will be returned at reduced rates.

The State Agricultural Society will hold its Annual Covention at Madison, the first week in February.

W. H. MORRISON, President, Madison.
H. K. LOOMIS, Treasurer, Sheboygan Falls.
D. W. CURTIS, Secretary, Fort Atkinson.

LAWS OF WISCONSIN RELATING TO PROTECTION OF DAIRY INDUSTRIES.

SECTION 4607, REVISED STATUTES, 1878.

Any person who shall knowingly sell, furnish, supply or bring to be manufactured to any butter or cheese factory, or to any person, to be used in the manufacture of butter or cheese, or to be used in any other manner, any milk drawn from a cow, not in a proper condition of health, or too near, either before or after, the time of calving, or any milk which is adulterated by any deleterious, or contaminated by any filthy substance, or any milk which has been skimmed, or with the strippings left out of it, or that has been diluted with water, or colored by any substance, or which has become filthy by careless milking or handling, or tainted or partly sour for want of proper care in keeping pails, strainers, or any vessels in which said milk is kept, clean and sweet, after notice of such taint or carelessness or failure to keep vessels, pails and strainers clean, and sweet, shall be punished by imprisonment in the county jail, not more than thirty days, or by fine not exceeding one hundred dollars.

CHAPTER 361, LAWS OF 1885.

Section 1. Whoever manufactures out of any oleaginous substances, or any compound of the same, other than that produced from unadulterated milk, or cream from the same, any article designed to take the place of butter or cheese, produced from pure, unadulterated milk, or cream of the same; or whoever shall knowingly sell, or offer for sale, the same as an article of food, shall, on conviction thereof, be confined in the county jail not exceeding one year or fined not exceeding one thousand dollars, or both.

Section 2. Sections 1 and 3, of chapter 40, of the laws of 1881, are hereby repealed.

CHAPTER 185, LAWS OF 1887.

Section 1. Any person who shall knowingly make, trafic and sell oleo-butter, butterine or any other imitation of butter or cheese, or who shall knowingly keep upon his table in any hotel, restaurant, or boarding house, any imitation butter, shall make the same fully known to the buyer, by posting up notices of the fact at, and in the place where such articles are for sale or consumption.

Section 2. Any person who shall omit posting up such notice, shall be punished by imprisonment in the county jail not more than thirty days, or by fine not to exceed twenty-five dollars.

Section 3. All acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

CHAPTER 157, LAWS 1887.

Section 1. Any person who shall with attempt to defraud, sell, or bring to be manufactured to any butter or cheese manufactory in this state, or sell for human food, any milk diluted with water or in any way adulterated, uncleanly and impure, or milk from which any cream has been taken, or whoever shall keep back any part of the milk known as strippings, or whoever shall knowingly bring or supply to any butter or cheese factory milk drawn within fifteen days before parturition or within five days after parturition, shall upon conviction forfeit the milk so delivered and pay a sum not less than twenty-five dollars nor more than one hundred dollars for each offense, to be sued for in any court of competent jurisdiction, one-fourth of said forfeitures to be paid into the county treasury of the county as other forfeitures are paid, in which the suit was prosecuted, and the remainder to the person or persons, firm, association or corporation upon whom such fraud or neglect shall have been committed.

Section 2. Proof of adulterations and skimming may be made by a disinterested competent person with such standard tests and lactometers as are used to determine the quality of milk, or by chemical analysis, and a certificate

of such test or analysis sworn to by the tester or analyst shall be admissible in evidence in all prosecutions under this chapter.

CHAPTER 240, LAWS 1887.

Section 1. Every person who shall, at any cheese factory in this state, manufacture any cheese, shall distinctly and durably stamp or mark upon each and every box, case or package of cheese manufactured and sold, the name and location of the cheese factory at which the same was made, together with the grade of the same, as "full cream," "half cream" or "skim milk," or as the case may be. And if any manufacturer of cheese shall sell or dispose of any cheese without such stamp or mark, or shall falsely stamp or mark the same, he shall forfeit and pay to any person who shall prosecute for the same the sum of twenty dollars for every box, case or package of cheese sold or disposed of without being marked as prescribed in this act, or with a false mark thereon, to be recovered in a civil action in any court having jurisdiction of the person and subject matter, one-half of such penalty to be paid into the county treasury of the county in which such action is brought, to be by said treasurer paid to the state treasurer for the benefit of the school fund.

CHAPTER 229, LAWS 1887.

Section 1. Every person who by any false pretence with intent to defraud shall obtain from any club, association, society or company for improving the breed of cattle, horses, sheep, swine or other domestic animals, a certificate of registration of any animal in the herd register or other register of any such club, association, society or company, or a transfer of any such registration, and every person who shall knowingly with intent to defraud give a false pedigree of any animal, upon conviction thereof, shall be punished by imprisonment in a state prison for a term not exceeding one year, or in a county jail for a term not exceeding six months, or by a fine not exceeding five hundred dollars, or by both such fine and imprisonment.

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS,

OF THE

WISCONSIN DAIRYMEN'S ASSOCIATION,

AT THEIR

FIFTEENTH ANNUAL CONVENTION,

Held at Sparta, Wisconsin, February 8th, 9th, and 10th, 1887.

The fifteenth annual convention of the Wisconsin Dairymen's Association convened at the opera house in Sparta, Tuesday, February 8th, at 10:30 A. M., President Morrison in the chair.

President Morrison addressed the convention as follows:

It is very gratifying to look over so goodly a number at this, the organization of our meeting at Sparta.

I had a foretaste of your hospitality, your courtesy, and your appreciation last winter at the institute that we held at this place, and I have looked forward for many weeks to our meeting at Sparta, knowing that the inspiration and the enthusiasm we should meet here would make us feel perfectly at home. In holding something like thirty-four institutes this winter, we have been obliged to discuss all departments of agriculture. A diversified program. We were not confined entirely to dairying; we mixed up with swine husbandry and sheep husbandry, and all those industries that cluster around the farm, but here it is nothing but the dairy and if there is any subject in this world that I like to talk about, it is dairying. It always appears to me, that in the mixed farming that we have so much of in the west-

ern states, that they shut up shop just about six months in the year, and farm it six months. Now, what would you think of Mayor Thayer if he closed up his bank six months of the year, and worked the other six months? That is just the way that the average farmer does. He commences in the spring, and it is hustle and bustle, rise early, and work late; it is sixteen hours a day for half the year. But when we come to dairy farming, there is a uniformity of work during the entire year, and a uniformity of revenues that are constantly pouring in, and go where you will, the men engaged in dairying are prosperous men. They have fine buildings and fine homes, all conveniences, and a good many of the luxuries of life. So, whenever I talk about dairying, I get warmed up. Now, it has been our practice in our meetings to have a sort of experience meeting at the last. We are going to reverse the order and have the experience meeting first. We have some gentlemen here that the state is very proud of, that have been connected with the Wisconsin Dairymen's Association from the first, and I always refer to them as the "immortal nine." There were only nine men who organized this association fifteen years ago.

Now, I will take great pleasure in introducing to you this morning, a man that has worked long years in the dairy industry. I refer to Col. R. P. McGlincy of Elgin, secretary of the Illinois Dairymen's Association, and also secretary of the Elgin Board of Trade.

R. P. McGlincy—*Mr. President, Ladies and Gentlemen:* This dairy interest; what is it? What has it grown to? From whence came it? Now, I only refer to the dairy industry in the northwest, I need only to go about two hundred and fifty miles south of this to locate the beginning of the dairy ndustry, and that point has been for many years, the center of the dairy industry of the northwest. In the city of Elgin, which I claim as my home, in 1852, the first, real, active dairy business was done by a man who had traveled almost over the entire country with the expectation of bettering his condition. From York State to the prairies of Illinois, and from the prairies of Illinois to the golden shores

of the Pacific. In all his wanderings he was seeking for that for which we are all seeking—money. The first few years that he spent in Illinois, he was engaged in grain farming. The longer he followed that industry the poorer he became. He went to California and he didn't find that gold grew on the bushes there, as it had been represented, and after a year or two he returned to northern Illinois, and conceived the idea of engaging in the dairy business. He made arrangements with a firm in Chicago, and shipped them one can of milk per day. In a little while the demand grew and it became necessary to ship more milk, and as he had but a small dairy, he was obliged to call upon his neighbors for assistance and secure milk from them, and from that beginning there is shipped to Chicago to-day from our place, about ten car-loads of milk, shipped in cans containing about eight gallons.

In addition to that, in our town we have a milk condensing factory that is now using a little over 7,000 gallons of milk daily. We have a creamery which is using about 15,000 pounds of milk daily. In that whole section creameries and cheese factories are dotted upon almost every four corners. In the county in which I live there are at a low estimate, 44,000 head of milch cows.

The farmers, when they began this dairy business, were burdened with debt, their farms were mortgaged, their stock was mortgaged, everything but wife and babies, was mortgaged, and they knew not how to get from under that burden.

But with that characteristic enterprise which has marked the history of the people who have settled these prairies of the west, they made one mighty, supreme effort and turned their attention to the cow, that being which can lift more mortgages from the farm than any other device that has ever been brought to the attention of man. And as they got more to understand the business and to prosper in it, they began to improve their condition, financially, socially, and I may say, morally: for it is a fact that a man who will care for stock that is entrusted to him, can not help but be the better for it.

So these farmers began to improve their condition, and in a few years instead of having mortgages hanging over them, they were loaning money themselves to their less fortunate neighbors.

As the industry became general around Elgin, it spread to Wisconsin until to-day there are 650,000 cows, producing a reenvue of about $25,000,000 annually, all of which has been brought about within a very few years and I may say, I believe it has been brought about very largely by the efforts of this association.

When our people began the dairy industry, they found that they lacked intelligence; they did not know the habits of the cow; they did not understand their situation and they gathered themselves together in a little farmer's club, known as the Fox River Farmer's and Dairymen's Club, which for many years held meetings at Elgin. That club grew, and finally a few gentlemen from Wisconsin visited the club on two or three occasions and learned from these people how they were doing, and they too became posessed of an idea that education was needed if this business was to be made a success, and from that club originated the great North-Western Dairymen's Association, and from that association sprung the Wisconsin Dairymen's Association, the Illinois State Dairymen's Association, the Minnesota Association, the Iowa and the Nebraska. So that all these associations in their educational work, have been the means of lifting the farmers up and teaching them how and what to do.

That the dairy interest has done much for this country, can be readily proven by the condition of those farmers who have been engaged in it. I want to say to you, that if you go into the business with the expectation of becoming rich in one year, you make a mistake, but by intelligent, careful work, by understanding the routine, and looking after the smallest details, you can make the business pay you handsome profits on the investment.

Not many weeks ago I heard Jubge Wilcox announce in a public address, that on a cash valuation of $27,000 for land and stock, he was receiving six and one-half per cent. in-

terest. I would like to know if there is a grain farmer in this northwestern country who is doing that.

I do not believe there is any other way by which such an an amount of interest could be secured except through the means of the cow. She should be carefully handled, she must be well cared for, well fed and regularly watered.

In our state we have about one million milk cows, valued at about thirty-five dollars per head; so you see, taking into consideration the value of the cows, the land, the farming and factory machinery, it is a vast industry. Now, this industry cannot be overdone, because according to the population, we have a less number of cows than we had twenty years ago. In other words our population is increasing with much more rapidity than the cows on our farms, and so long as we produce good butter, we can always expect to command good prices and we shall find a profit. I know a number of people engaged in dairying on their own account, who for the last year, 1886, averaged twenty-five and one-half cents per pound for their butter. This industry since 1852 has grown into such vast proportions that it is almost impossible for the human mind to conceive it. I will now stop talking, and let some of the illustrious nine talk to you.

The President — The illustrious nine to-day are only represented by two. I will introduce to you Stephen Faville who will speak for himself in reference to the work that has been accomplished in the last fifteen years.

Mr. Stephen Faville — *Mr. President, Ladies and Gentlemen:* I want to emphatically endorse all that Colonel McGlincy has said in relation to the benefits that redound to the farmer that will persistently and intelligently substitute the cow for the plough in this country. The colonel has not drawn the picture any too finely. He generally tells a little more than he knows, but he is not stretching it this time. I am glad he is improving. I have known this dairy business intimately and personally almost from my earliest recollection. I was born and reared in Herkimer county, New York, the headquarters of dairying in America. I want to tell you a little experience which will illus-

trate the idea of the beneficial results of dairying. I was about the last of twelve children, we lived in a timber country and it was pretty hard work for a man to support that family. My father had got in debt $300, and the best he could do, it was hard work even to pay the interest. An uncle of mine had some property fall into his hands in another part of the state that had to be attended to. He came to our house and wanted my father to go down and take charge of his dairy for him, forty cows. I was about fourteen years old. While they talked about it, I sat and listened, as children were taught to do in those days. He says, "John, I want you to take some part of your family and come up and run my dairy for me, while I go over to that other property." The result was, that father and two of my sisters, and some of us boys, went over there, and in one year the profits paid off that $300 debt, and we got an idea of what the dairy business would do, and the next year we went to making cheese on our own farm, and after that we always had enough to eat. In 1844, my brothers and myself came west with our dairy knowledge.

Col. McGlincy thinks that Elgin is a tremendous place, and it is. He thinks all the dairy intelligence in the state starts from there, but there he is mistaken. In 1844 we had a dairy of twenty cows in Jefferson county, and manufactured cheese, and did that right along. While I admit that Elgin is an immense dairy center in this country, it is not entitled to quite all the credit. But the colonel did not extol the cow as a mortgage lifter any too highly.

I want to say a word about the "immortal nine," because when I get to thinking about it, it almost makes the buttons burst off my vest. I was associated with the old North Western Association from its infancy. I was not present at the organization, but was at the meeting the next year at Rockford and from that time on. That run till fifteen years ago, when we began to think we ought to have something nearer home, and nine of us met at Watertown, and from that beginning has grown this organization, one of the greatest powers in Wisconsin.

I have in all these years spent a good deal of time and

money in this matter, but I feel a good deal of satisfaction in it, and am glad that I have been able to help along a little so good a cause.

The President — We have heard from Illinois and Wisconsin, and we will now hear from Ohio. I was fortunate in finding a man in the state of Ohio that did not care to be president or governor, and there is no doubt before this convention is through, that he will have silos on every farm. I take pleasure in introducing to you John Gould, of Aurora, Ohio.

Mr. John Gould — *Mr. President, Ladies and Gentlemen:* That is a very flattering send-off. Old Ben Wade once said that the Western Reserve was God's foot-stool, but he did not give the cow credit for it, and the cow should have the credit. When the early settler came from the east he brought the cow, and instances are on record where the cow brought the whole family and fed the children in the meantime.

My grandfather has told me about the faithful cows, and how careful they were not to work them too hard, so they would give a good mess of milk. About 1816 the Western Reserve was all covered over with dairies, but then it was over-done, and by 1818 the dairy interest was at a stand-still in Ohio.

A boy who had run away from home, because there was no place for a boy on the farm, went down the river, and in the markets of New Orleans, English cheese being sold for one dollar a pound in gold, and he conceived the idea of bringing cheese down there from Aurora and selling it for half a dollar, if he could not get one dollar for it, and without a dollar in his pocket he walked home, and gathered up two tons and got his neighbors to draw that cheese one hundred and twenty miles across through the woods to Pittsburg, and he drew it on a scow down the Ohio, and sold it all for a good price, and he had paid two cents a pound, and then he came back and got ten tons more. After finding a market for their goods, the Western Reserve began to improve again. They built good houses, improved the farms and sent the boys and girls to school, and the Western

Reserve swung up right into the front rank in intelligence and prosperity. I want to say to Col. McGlincy, that it was an Ohio boy that gave the first nibble of cheese to an Illinois man.

In 1835, a cow was brought to Chicago, then Fort Dearborn, and the next year the same man went to Milwaukee, and erected the first frame shingle building and put cheese into in. Ohio afterwards learned the lesson that dairying alone would deplete a farm just as readily as wheat growing, and we learned that we must try and fertilize our farms and bring in two revenues from our farms. We found out that if everybody made cheese and butter, we were overdoing it, we must also raise grain.

We have found that we must study the markets, and that we must change from summer to winter dairying, so as to make the flow of milk uniform. We are also learning the rotation of crops, tnen we are learning a great many things about dairying; about warming the water that the cows drink, and making everything more comfortable for them. A good many new things we are studying out and hope to profit by that study.

The President — Fortunately we have reserved a Wisconsin man to tell the last story, and if there is any name in Wisconsin connected with the dairy, that name is C. R. Beach, of Whitewater, who I take great pleasure in introducing to you.

Mr. C. R. Beach — *Ladies and Gentlemen:* You see the work that is marked out for me; to tell a bigger story than this Illinois or Ohio man has. Now, they have done their best, but I am not going to take advantage of them. We have got two days and a half to tell what we have done, and what we can do. I know that you are all hungry, and I am going to wait until after dinner and then I will commence, and if at the end of the time you don't say that we have done better than they could possibly do, then I will tell a story that is not true.

Convention adjourned to meet at two o'clock P. M. the same day.

AFTERNOON SESSION.

FEBRUARY 8th, 1887.

Convention met pursuant to adjournment at two o'clock P. M. President Morrison in the chair.

Music — "Welcome" — by Double Quartette.

ADDRESS OF WELCOME.

BY MAYOR M. E. THAYER.

Mr. President, and Members of the State Dairymen's Association: In behalf of the citizens of Sparta, and in the name of the 3,000 farmers of Monroe county, I have the honor of extending to you a cordial welcome. We are familiar with the work you have done in other portions of the state, and believe you are here to do us good also. We believe you have come to aid and encourage an industry long neglected by us. To give us new ideas, new suggestions, new inspirations, that will elevate the standard of our agricultural industries and add thousands of dollars to the wealth of our people. We recognize the fact that agriculture is the foundation of all our prosperity, and the dairy interests chief among its industries. We recognize the fact that good farming produces not only good crops and good stock, but good men, good women and good citizens. It not only builds up thriving towns and cities, but places a schoolhouse on every hill, and neat cottages in all the valleys.

Gentlemen of the association, the greatest undeveloped resource of Wisconsin to-day is the industry you represent. The 21,000,000 bushels of wheat produced in 1885 exhausts our soil and gives small return for our labor. The $27,000,000 in lumber manufactured leaves our land barren and almost worthless. The rich iron mines of Northern Wisconsin, producing fortunes like magic, are festering with dens of sin and vice. In the track of each follows a scourge like the devastation of war. The dairy products of our state have increased within a few years from $1,000,000 to nearly $20,000,000 annually. Yet who can estimate the breadth or fathom the depth of this industry when fully de-

veloped? Ten millions of dollars annually may be all too small. But this is not all. Instead of our exhausted soil and barren lands, or the vices and evils of mining regions, we have in dairying are generated soil, a high grade of stock, beautiful farms, comfortable dwellings, a good bank account, and, above all, a production of intelligent sons and daughters — fair hopes and bright promises of men and women to honor the name of American citizen.

Farmers of Monroe county! I desire to call your attention to the following facts and ask you to give them a thoughtful consideration. In population and area our county averages well with the other sixty-six counties of the state. We have the purest springs and finest trout streams in the world. We have a healthful and invigorating climate for man and beast. We have woods, hills, valleys and every variety of soil, all combined making one of the best natural dairy counties in the state. If, then, with all these natural advantages in your favor, you are making less cheese than the average in other counties, there is something wrong, and you are neglecting an important industry. If you are getting less price for your butter than other counties, there is something wrong, with the butter and you should make it better. If the hogs and cattle you sell bring less price than in other counties, there is something wrong with the breed, and you should know what it is. If the cattle on hand are not as good as in other counties, there is something wrong with the grade, and you should apply the remedy.

Now, what are the facts. In 1885, the state produced 33,478,900 pounds of cheese, which sold for $2,984,813. Had this money been divided equally among all the counties of the state, Monroe county would have received as her share $45,224. What did she receive? — just $1,394, leaving an actual loss of $43,830 by not being an average county.

In 1885 the state produced 36,240,431 pounds of butter, which sold for $5,850,402, being an average of 16 11-100 cents per pound. Monroe county produced 619,394 pounds, being more than the average by counties, which sold for 12 9-10 cents, being 3 2-10 cents per pound below the average price

in the state, making an actual loss on your butter of $18,581, because it did not average in quality.

In 1885 the state sold 1,047,156 hogs at $9.86 each. Monroe county sold 18,312 at $8.36 each, making a loss of $1.50 on each hog, and a total loss of $27,486, because you are raising a poor breed.

In 1885 the state sold 221,377 cattle, at $27 each. Monroe county sold 2,573 at $22.40, making a loss of $4.60 on each one, and a total loss of $11,835, because you are raising inferior stock.

In 1885 Monroe county had on hand 24,908 head of cattle and young stock, worth $4.70 per head less than other cattle of the state, a loss to the county of $117,067, for the blessed privilege of raising scrubs.

In 1885 there were 2,989 farms in Monroe county, 63,760 acres of which are improved. Nearly one-half of all this improved land was sown to wheat, the average yield being fourteen bushels per acre, selling at 66 cents, and realizing $9.24 per acre.

Farmers of Monroe county, are you satisfied with this record? Are you willing to suffer this annual loss of more than $100,000 in the production of butter, cheese, hogs and cattle? Have you a pride and respect for the business of farming, and would you know the remedy for these evils? Do you appreciate the great benefit that may be derived from this, the fifteenth annual meeting of the state dairymen? Do you realize that the members of this association come to you with just the advice, experience and information you need? Will you then join me in this hearty welcome and bid them Good speed in their work?

Knowing most of you personally, I am already assured what your answer would be. It is therefore my pleasure to extend to all a hearty welcome to our city, and a cordial invitation to the great intellectual feast that now awaits you.

RESPONSE.

By COL. R. P. McGLINCY.

Mr. President, Ladies and Gentlemen, Mr. Mayor: On behalf of the Wisconsin Dairymen's Association I desire to accept these cordial words of welcome which you have extended to us on this occasion, and I assure you, sir, that we appreciate what you have said, the manner in which you have said it, and the reasons which have led you to utter these words. I might say that it is customary for us to accept such words of welcome on an occasion of this kind, and yet when they come so earnestly, so cordially, we can not but feel that they come from the heart and are not merely uttered, that they may be heard. I have been surprised at some of the remarks, which you have made here about this county, and yet I shall be much more surprised if within the next three or five years, if I may be permitted to visit this section, I do not find that this farming community have not improved the opportunity that is placed before them, and we shall not, I think, in the future, hear such a lamentable tale as has been rehearsed to-day.

Now, I wish you could carry your mind's eye to the southern part of this state, where you may see what has been the result of engaging in the dairy industry, where you may see improved farms, improved stock, and the improved condition of the men and women on those farms, and then have you tell me whether you desire to continue in a business, that not only robs the soil of its fertility, but robs you of your possessions.

When I look over this vast northwestern territory and see what improvements have been made in the last ten or fifteen years by reason of the introduction of the dairy business, I am not surprised that so many wish to go into the business. Many of you know that a few years ago the butter produced upon the farm, did not sell for as much by fifty per cent. as does the creamery butter that is manufactured to day, and why? Simply because the men that are engaged in the manufacture of creamery butter have put

their intelligence in the work. They have studied to please their customers, and in so doing, they have benefited their pockets, and let me say to you, whatever your customer demands of you in the production of your butter or cheese, give it to them.

Do not consult your taste, but the taste of those who buy and pay for the product. If the customer desires that you shall color your butter, as is wanted by the St. Louis and New Orleans market, until it is the color of red brick, do not hesitate to give him all the butter-color you can use in the butter. Study the wants of the market, use improved machinery,—and you have it made within your own state, I need not refer to one who has become famous through the rectangular churn, you all know him,—but use improved machinery, and let me say to these farmers, that whenever they want a mower or a harvester, they don't hesitate to buy it, but if the good wife wants one of Curtis' churns they are liable to look long at the pocket before they consent to the new-fangled notion, and that is not right. It ought to be the privilege, as well as the duty of the farmer to lighten the cares of his helpmate as much as possible. The best machinery is none too good for Wisconsin dairymen to use. Use your judgment and intelligence and common sense.

There is one more thing I want to say. This is the first time in many years, that the dairymen of this state have met in convention, when they were not forced in the markets of the country into competition with spurious compounds sold for butter, but to-day we know that oleomargarine, butterine, and all other "ines," are under the ban of the law, and can not be sold for genuine butter, and already the good effect of it is seen in the fact that butter manufactured on the farms, has increased in value almost thirty-three and one-third per cent.

Now if that law has done so much in so short a time, what may it not do if the farmers will act intelligently and endeavor to improve the quality of their butter. Such butter ought to go on the market and sell for the same price as creamery butter, and the reason that it does not, is often, not because the butter is not as good, but because

the farmer has fallen into slovenly habits and does not pay proper attention to his milk and cream, and consequently he suffers in dollars and cents. Now, this convention has prepared a programme of great variety, and I am satisfied that from this day forward there will be a noted improvement in the manufacture of your butter, and in the conditions surrounding you in your homes and on your farm.

This association, like many of such associations in the west, is an educational institution, and when it comes into a place it it leaves its impress, and the influence that goes out from this association, is broadening and deepening all over the state, bringing prosperity to all those who labor patiently and hopefully. Now, Mr. Chairman, I thank you for honoring me in calling upon me to respond to this able address of welcome. I accept it on behalf of the Wisconsin Dairymen's Association in the same spirit in which it is tendered. We believe it comes from the heart, and we receive it into our hearts and we hope that great good may come to this, your beautiful city and broad country, from thus rubbing against each other in this convention.

Music. — "Hail America." — Double Quartette.

Mr. Faville called to the chair.

ANNUAL ADDRESS OF THE PRESIDENT.

BY W. H. MORRISON, MADISON.

Wisconsin has been, and it is still a rich heritage of wealth for those who have chosen to seek after these hidden resources in the soil, forest and mine, and no state in the Union can in the few brief years of its history show more remarkable development, substantial wealth, health and prosperity in all its avenues of labor. It is but a few years since Wisconsin made its first package of market butter and its first cheese, and now with its 650,000 dairy cows, and a known annual product of nearly $25,000,000, the

dairyman can point with pride to these phonomena, and say to any other industry, show us a larger, cleaner and more honest record. Our state is the natural home of the dairy, yielding the most perfect ration for the cow — the rich blue grass and red clover. Its clear, rapid running streams of water, its abounding springs are the foundation of good milk. Now when the dairyman combines these with warm barns and the mechanism of the dairy, he has secured nine of the ten points of success, for these adaptations are not for a section but are the common heritage of the whole state. The dairy must perforce be a feature of success in the now recognized necessity of animal husbandry in successful agriculture, as it has a three-fold element of grain production and subsequent growth of animals, a production of food elements, and lastly a feature of food value for all forage and grain consumed upon the farm, and yet leaving 90 per cent. of this very food behind to make up for subtraction of fertility of the soil. One has but to look to the census reports to find that the dairy country is not only rich from the sales of its butter and cheese, per acre raises more grain, and in amount keeps abreast of the farm revenues from all sources, of other countries that assert that dairying does not pay.

I will compare your own county of Monroe with the two dairy counties of Sheboygan and Jefferson, giving first the improved, the wild and the unimproved land of each, and you will see, after taking note of the lesser amount of improved land here, and the much greater yield of the other counties shows a production per acre of far more magnitude because they have, with the cow, made the land more fertile, but are only doing what you can do as certainly as they.

NUMBER OF ACRES.

	Monroe.	Sheboygan.	Jefferson.
Improved lands	138,610	195,047	188,875
Wood land	63,760	58,549	35,610
Unimproved land	160,332	42,429	79,533
Total	362,702	296,016	304,018
Cash value farm lands	$4,528,102	$16,413,746	$14,099,225

AMOUNT OF PRODUCTIONS.

	Monroe.	Sheboygan.	Jefferson.
Hogs	$65,493	$79,291	$126,683
Cattle	333,176	981,504	753,293
Sheep	36,032	46,583	68,829
Horses	567,098	869,971	753,214
Cheese	1,394	717,609	275,660
Butter	80,290	99,136	193,367
Cloverseed	5,855	24,252	3,208
Hay	235,018	453,048	405,007
Wheat	262,813	335,284	294,717
Corn	161,687	173,758	501,087
Oats	182,321	278,469	202,219
Barley	41,433	223,043	291,075
Rye	12,981	58,844	33,674
Beans and peas	1,865	40,877	2,327
Potatoes	55,210	99,937	63,908
Wool	16,673	21,194	38,678
Total	$2,060,250	$4,484,810	$4,006,950

IMPROVED METHODS STILL NEEDED.

Granting all this substantial progress, is there not room for improvement and profitable advance in method. First, we need a more equally balanced production of product. The consumption of butter and cheese is nearly equal for the different seasons, yet the production is nearly three times greater in summer than winter. With modern ways of dairying it is profitably possible to make dairying continuous, and with a consequent tendency to uniformity of prices. This would make risks of buying and selling less, and lessen the chances of loss. Again, this feature would be more in the line of pleasing the consumer, who has a right to demand of us a choice-made article, and the study of the markets give proof that the consumer is willing, and does by his daily practice, pay a premium above market rates for the butter and cheese that pleases his palate; and successful dairying in the future must be more in the line of supplying the consumer's wants.

Again, have we not reached a point where we may make a greater variety of food products from our milk? We have succeeded in perfecting many pleasing ways of attracting

the eye of the consumer with fancy packages more in the way of fancy cheese? We are importing them from Europe at very high prices. Why should we not manufacture them in Wisconsin, and cater to a class of customers who now are supplied by foreign brands of fancy cheese on account of American producers not making an article that pleases their taste?

Dairying in the future, to be yet more profitable, must find a part of that profit in cheaper produced and more equalized rations; rations more to nature's demand for the article produced. We must not only experiment more, but keep a close eye upon our experiment stations, and find that outside the domain of exclusive hay, corn and grass we shall solve the problem of cheap, abundant and profitable food for dairy stock.

Our association should ask a sufficient appropriation from the state to institute some system of instruction by which the latest and most improved methods of manufacturing butter and cheese can be brought to the people. A dissemination of dairy literature, the establishment of dairy schools at different points in the state where instruction can be given at a nominal cost by successful butter and cheese makers.

Since our last annual convention the oleomargarine laws have been passed not only by the general government, but also similar and special laws by several states, notably Ohio and Pennsylvania. A special law of the latter state is prohibitory in its character and has recently been sustained by the supreme court. The manufacturers of butter substitutes have been busily scattering petitions throughout the length and breadth of our country, requesting congress to modify or to strike off the license fee to make and sell their adulterations. There is not one farmer of the 7,600,000 of the United States that has not an interest here, that, means life and prosperity in dairying, or death and its total extinction not only to the dairy, but a stinging blow at animal husbandry, that will seriously affect all departments of agriculture. The passage of the oleomargarine bill was the popular uprising of the people for honesty — the commencement of warfare against deception, fraud and adulteration.

A DAIRY COMMISSIONER.

Does our state need a dairy commissioner? or some officer who shall have police power over all food adulterations? If we look to Ohio we may glean a thought on this subject. Last year the legislature created the office of dairy and food commissioner with a small appropriation to aid him. At the outset he found twenty-one factories of bogus butter in full blast and 2,400 sellers of the same. In eight months eighteen factories had suspended, and of the 2,400 sellers, only 138 remained, and seventy-two of their number have given notice that they will take out no new license after April 1st, next. The commissioner is now after the adulterations of maple sugar, coffee, etc. I would suggest that resolutions by this association be adopted asking our legislature to formulate a bill providing for the appointment of a food commissioner, which will not only place substitutes for butter and cheese under surveillance, but all forms whatever of adulterations of food. Such a law would be hailed with delight by all classes.

In conclusion, I hope that the sessions of this convention will be marked by courtesy and that teachable spirit which is constantly looking and endeavoring to do as old John Brown said when they led him out for the last time and the patriarch who dared to do what he thought was true and right, as he reviewed the struggle of a hard tempestuous life, and took in all the beauties of nature said: "It is a great thing in this world to do the best you can."

DISCUSSION ON PRESIDENT'S ADDRESS.

Mr. Cheever — There was one feature of the address that impressed me very strongly, and that is the unprofitableness of grain farming exclusively, in comparison with grain and stock farming combined. I believe, sir, that if a man owns a quarter section of land in Wisconsin, and has been spending his life, or any portion of it, in raising grain on that quarter section of land, that if he will seed down one-half of it, and will put stock on some of it, that in a very few years

he will raise more grain on the eighty acres than he has been raising on the whole quarter section, and have the benefit of his flock of cattle and horses and sheep and hogs in addition to the grain crop.

It was moved and seconded that a committee be appointed by the chair to take into consideration the address of the president, and make such recommendations in regard to it as they think proper.

Motion carried, and committee to be announced hereafter.

TREATMENT OF SANDY SOILS IN DAIRY FARMING.

BY N. E. ALLEN, BEAVER DAM, WIS.

Plow and sow to rye two bushels per acre the last of August. Sow three quarts each of clover seed, blue grass and orchard grass. Sow gypsum 150 pounds per acre at the time the grain is sown; cultivate in at least one inch deep, as nearly uniform depth as possible. Plank or roll at the time, to press the ground upon the seed to insure more certain growth. Keep all stock off in the fall, except calves, and not enough of them to eat it close. Allow the whole to grow, and thus form a mulch for the roots in the winter and this will prevent its freezing out and make it fresh in the spring. Clover chaff scattered evenly over this seeding will still further protect it, and in the spring will mulch the ground and greatly stimulate the growth by keeping the land moist, and enable the land to absorb the ammonia brought down by the rains and the dews, and also prevent the evaporation of that generated in the soil by the decomposition of vegetable substances in, and on the soil, and thus save the ammonia.

Commence feeding about the middle of May. The stock will eat the rye first and it will make good feed. They will crop some of the grass, but mostly rye, until it is gone, when the clover, if of medium, will be large enough, together with the blue grass and a little of the orchard grass. The blue grass will gain upon the clover, and by the middle of June

will be ahead, and from this until the middle of July, the blue grass and orchard grass will grow together nearly even, until the first of August, when the orchard grass and the new growth of clover will take the lead.

Thus we have a succession of grasses fresh, and a variety so much relished by stock, and all easily digested. About three quarts per acre of timothy may be substituted for part in place of blue or orchard grasses; although inferior for pasture, it will still make variety, and that is desirable.

Another plan, sow grass seed upon rye in the winter, as indicated above, together with the gypsum, (if it has not been sown with the rye in the fall). Sow as early in the spring as possible, and cultivate, the cultivating will not injure the rye, and will greatly insure a catch of the grasses.

After the rye is harvested, keep all stock off that field in the fall. Allow the young clover and grasses to grow and form a thick mat all over the ground. The stubble will keep the snow on the ground, and the young growth of grasses will be pressed down by the snow, and thus still fur ther protect the grass roots.

When spring comes, the young grasses thus pressed down will mulch the land, and greatly stimulate the growth of grass.

About the 20th of May, turn on enough stock to keep this down so neither clover or grass will head out, but not enough to make short feed. You can thus secure fresh pasture usually through the season.

Manure may be scattered on this new seeding at any time after the grain is harvested, provided it is evenly spread. You need not fear killing the grass, and it will help to mulch the ground. The grass will push through this manure, and as the ground is thus kept moist and mulched, it will save the ammonia.

You will thus be enabled to make a thick turf for your soil; a most desirable way to improve sandy land.

To keep your stock through the winter, hay or feed must be provided — clover makes the best hay in the world for all kinds of ruminating animals and for horses, if properly cured. It is easily assimilated to growth or milk.

Fully one-third of every farm should be seeded, for mowing and pasturing. That for mowing should be clover with a slight mixture of other grasses. An animal will give better results with a variety of food, even if straw has to be used.

If seeded to clover six quarts per acre will be enough, if it grows properly.

The second crop may be cut for seed, if it fills, which can be determined in season, and this can be more thoroughly secured by sowing one hundred pounds of salt per acre immediately after the first crop is cut. If it should not fill, cut for hay. It will make first-class hay for all kinds of young stock, cows and sheep.

Clover-seed is one of the most profitable crops we can raise on sandy land, and the least exhausting. It is a necessity for seed, and the surplus to sell.

My advice is a three years' rotation. First pasture or mow, break in the fall, plant in the spring to corn or sow to small grain, sow to rye again in the fall and seed as above or in spring, having previously put all your manure on your clover, or pasture while growing. Every farmer should make the most possible use of clover chaff and straw to scatter on knolls and sandy places, it is much richer than barn-yard manure, besides the seed in the chaff is utilized.

Finally, study nature in her methods of renovation of soil. The tendency of all soil is to produce vegetation. If the seed of forest trees are scattered upon soil congenial they will grow, and as the leaves fall and are left upon the soil they mulch the land, keeping it moist and each succeeding year will give increased strength to such soil, not only from the decay of the leaves, but the mulching, keeping the soil moist and thus enables the soil to take up the ammonia from the decaying leaves.

Thus large forests are grown, and the land constantly improves while the forest is growing. Hence the importance of preventing the fires from running and burning the leaves and leaving the land bare.

CLOVER AS A FERTILIZER AND CLOVER FOR PROFIT.

BY B. S. HOXIE, CORRESPONDING SECRETARY OF THE WISCONSIN HORTICULTURAL SOCIETY.

Mr. President, Ladies and Gentlemen: Among all the topics presented for your consideration, I know of none that so nearly lays at the foundation principles of successful farming and dairying as the one I have chosen. And while I shall occupy your time for a brief half hour I may not present so much that is new, as I shall to enforce what is of more consequence; fix the important points where you can find them.

The business man to be successful must keep up his capital stock, and if his business is worth anything, and pays on the investment he must by the laws of trade and the progress of events make an increase of capital, or else competitition will drive him to the wall.

The farm is the capital stock in trade to the farmer, and to keep that in the best possible condition, or up to its highest state of fertility at the least expense or outlay of money is the question. The trained eye will tell very nearly what the capabilities of the soil are in given localities, for he knows that certain elements are necessary to plant growth. The chemist, with his skill in the laboratory, will tell us all of the elements in each plant or grain, as also the organic and inorganic elements of the soil. He tells us that of the sixty-four elements in nature agriculture deals only with thirteen, and from the thirteen our main supply of plant food as well as animal is made up from three, viz.: Nitrogen, phosphorous, or phosphoric acid and potash. So that any soil to be productive must contain largely these elements of plant food in a manner to be assimilated by the plants grown on the farm, or the labor of the husbandman will be in vain. Now nature in her great laboratory has made a wonderful provision of all these elements of plant food, but she has not always placed them in that relation or form to be utilized or used by plants year after year,

without some well directed effort on our part. We know that certain kinds of crops or plants grown on the farm year after year will deplete the soil of these elements necessary to its growth. At least we say that the soil is exhausted, worn out, needs rest, etc., and the old treatment used to be summer fallow.

Now, upon this theory of worn out soils, let us look at some facts, as the science of chemistry presents them to us, and then perhaps we can better adapt ourselves to the requirements which nature exacts.

As one of the exhaustive crops I will take wheat as an example, which Prof. Mapes tells us is made up in grain and straw of silicia, potash, phosphoric acid, soda, peroxyd of iron, chloride of sodium, magnesia and lime. It will not be necessary to give the proportion of each, but simply say, of all these elements in grain and straw to produce twenty-five bushels to the acre, it requires about 245 pounds, and 210 pounds of this is required for the straw.

Now, let us examine any good loamy soil, for a depth of say ten inches, and this same science of chemistry tells us that it contains silicia enough for 221,400 crops of wheat, potash enough for 2,480, phosphoric acid for 775, lime for 85,850, magnesia for 885, sulphuric acid for 26,224, soda for 37,335, peroxide of iron for 296,675 crops of wheat, and chloride of sodium enough for an indefinite time.

It will be seen by this that there is no alarm for an immediate famine for plant food, in our time at least. But here is another point which chemistry is not always so certain about: It can not always tell us whether these elements are in proper condition for plant food, *i. e.*, plants of a high order, for granite, lime, feldspar, etc., in their original form, would be rather poor fare for a crop of growing wheat. So, I hold that all plant food must be in a progressed condition in order to be assimilated by them. For though a cerain portion of plant food be lime or the carbonate of lime, yet the carbonate of lime in marble dust and the carbonate of lime in old plaster (lime mortar) long exposed to air in our buildings may show the same elements.

They are quite unlike as plant food. We are told that

feldspar on analysis shows seventeen per cent. of potash, but in that form it is nearly or quite worthless for plant food, however finely it may be pulverized.

Now, chemistry is not at fault in this, for it deals only in the principles of science. It puts us, though, in direct communication with nature's laws, though it can not tell us of the subtle influences pervading all forms of life. Can any one tell why a growing grape vine will send out its roots in the direction of decomposed bones, but will not cling to a block of marble.

You will see, then, from the facts that I have given, that there really is no such thing as an exhausted soil, but rather that the organic matter of the soil is not developed to a condition in all of its elements to properly nourish a wheat plant it may be. So by applied science and a system of rotation of farm crops, we may be enabled not only to maintain an average yield, but to keep up that fertility. In taking this position I know that I am entering upon disputed ground; but, nevertheless, I believe that nature will always keep up a proper equilibrium. It possibly may, and doubtless is, forced beyond a natural limit; but, in that case, artificial means must be used to quicken any dormant element into increased activity. Indeed, we know this to be the fact in the increased production of any farm crop by the use of fertilizers in any form; for however poor the soil may be to produce any kind of grain or vegetable, we can not add one single new element to that plant or vegetable by any amount of fertilizer, in whatever form we may use it.

Then it may be possible not only to maintain the natural fertility of our soil, but to increase it by a proper system of rotation of farm crops. We know that some crops are more exhaustive, or taking up from the soil the more progressed elements of plant food, than others, and among these are wheat, while on the other hand we find that corn and clover are among the least exhaustive. We also know that some plants derive their supply alone from the air and water, as, for instance, our various parasitical plants that only want a support to cling to. In proof, again, that nature affords, in unseen ways, this supply of plant food, we

will take a small tree or shrub, place it in a pot of earth suitable for its growth, weigh both carefully, supply the tree with all the water it needs, with air and sunlight, then after a term of years weigh both tree and earth again, and it will be found that the pot of earth has but slightly diminished in its original elements, while the tree has very largely increased in all of the elements found in the soil.

We know that all plants derive their nourishment by absorption and inhalation, and it must all be taken in solution by the rootlets or from the atmosphere. I have given the elementary substances which go to make up the structure of the plant, and so if there is no other supply than the earth, which I do not admit, where could the petted plant get its increase. I will give Prof. Kedzie's opinion of the clover plant as to its capabilities for accumulating plant food in form for the growth of other plants, and it will show at the same time why it is so valuable as a fodder plant, because containing the element so necessary to the building up of bone, muscle and tissue of all our farm animals.

He says that an acre of good clover will make 5,000 pounds of hay, containing 282½ pounds of mineral matter or ash. In this ash will be 97½ pounds of potash, 96 pounds of lime, 34½ pounds of magnesia, and 28 pounds of phosphoric acid. The hay will also contain 108 pounds of combined nitrogen. So by this we see that there is food element enough in one crop of clover to supply plant food for from two to four crops of wheat.

From A. N. Breed, a student of agriculture, I find this statement: The air dried tops from an acre of clover produced 5,417 pounds. Weight of roots air dried was 2,068 pounds. This analyzed gave 91.5 pounds of nitrogen, 40.35 pounds of phosphoric acid, and 78 pounds of potash, for the hay, while the roots gave 47.36 pounds of nitrogen, 27 pounds of phosporic acid, and 31.96 pounds of potash. The value of these elements of plant food, taking their commercial price in the market would be some over $30.

Prof. Roberts, of Cornell University, gives us nearly the same results from experiments conducted by him at their experimental station.

The roots of the clover extend down into the soil from two to four feet, so that in their decay they not only furnish food for other plants but leave the soil in a loose friable condition, thereby fitting it more completely for any subsequent crop.

Prof. Kedzie says, "that if any person was preaching the gospel of agriculture he well might hold up the triple leaf of the red clover as a symbol of a trinity of blessing to the farmer, furnishing for his cereal crops from otherwise inadequate sources a sufficient supply of potasium, phosphorous and nitrogen; and if I were designing an emblematic seal of our national agriculture, I would make the central figure the clover leaf."

These are some of the facts which science presents to us, and the experience of years sustains the claims which are made as to its value for a manureal agent.

When a boy in the state of Maine, I remember a tract of sand land about two miles from my father's farm which we called an old wind fall. A number of years previous to my recollection a fire had swept over it destroying nearly every vestige of tree, or plant, leaving a thin, almost worthless soil; at least it was so considered. In time a few scattering trees, and now and then a clover plant made its appearance. As cattle roamed at large in summer time the patches of clover increased. After a time an enterprising farmer bought the land for a mere trifle per acre; he commenced clearing up and sowing clover seed. His neighbors said, what if the land was easy to till, it was a poor investment; but he kept on sowing clover and turning under some portion of it every year, until he had one of the best farms in that section of the country; and I have seen grown upon that land three hundred and fifty bushels of potatoes to the acre with no other dressing than a crop of clover turned under the previous year. This man bought no commercial fertilizers and only kept a small stock of cattle on his farm.

In talking not long since with one of our most practical farmers who for a number of years had grown clover very extensively, I asked his opinion as to its value for manure. Well, he said, you know when I bought this farm it was

pretty well run down by raising small grain year after year. I commenced seeding with clover, and a system of crop rotation — corn, oats, clover. One crop of each and sometimes two crops of grass. Of course I keep all the stock I can on my farm and make cords of manure every year, but if I had to draw that manure one mile away I believe I could keep up the fertility of the farm cheaper with clover turned under. It is not to be supposed that because clover is so rich in the elements of plant food which I have named, that we can continue this rotation and cropping with impunity and transport the product in hay and grain; nature does not recuperate in that way, but I do assert that the product fed upon the farm with all the manure saved, or the clover turned under, we need have no fears of an impoverished soil.

The farmer and dairyman who are posted as to the value of food products know full well that clover is one of the most valuable crops they can raise, and to such I need not say that one ton of good clover hay is worth more than one ton of the best timothy; but the careless husbandman will not believe what others have tested. The most thrifty and successful swine breeders now make clover pasture and clover hay, an important ration for all their breeding stock. And indeed, some of the best breeders assert that they never have had a case of hog cholera in their herds. They feed very sparingly of corn, but instead of this, clover, bran, shorts, oats, or in short nitrogenous food, which forms healthy tissue, and the fat will take care of itself. Mr. Theo. Lewis tells us that he has made a productive farm out of a worn out soil, by raising hogs and clover.

I know there is an objection on the part of some to raising clover because it winter-kills, and by others, that it is a difficult crop to save for winter food. Now first, it must be understood that clover is a biennial plant; it must not be cropped close in the fall after the spring seeding, for it needs some of the protection which nature designed by the leaves to protect the tender roots. The first cutting of the medium does not yield seed, as you all know, so if a permanent meadow for a few years is desired as a mixture

with other grasses, the seed heads must not be entirely stripped from the field.

As to cutting and curing, one good sunshine day is all sufficient. Mr. Bonham's method of Ohio, is this: He cuts after the dew is off, turns it over, or uses a tedder and draws in before night, stows in a tight barn, and covers the top with dry straw or hay, and it comes out bright. And I know of scores of farmers who practice this method; but to insure success the barn or storage place must be tight on all sides, a tight bottom and dry hay or straw on top.

But with the silo there need be no excuse for not having a plenty of the best kind of fodder for all kinds of stock, including the pigs and chickens.

I have tried to give you, upon the science of chemistry and by practice, some of the reasons with facts showing why the clover plant above all others is one of the best for the farmer to raise. But all the facts, of science or chemistry will do us no good unless we put them to an intelligent use.

It is related of a certain nobleman who took much pains to have a well kept garden, and paid well the hire of a professional gardener, that in riding out one day he passed a small garden where everything was growing with the utmost luxuriance. Calling the owner to him he said, you must have a very learned and skillful gardener. Oh, no; he is only a common man; and he introduced his gardener, to whom the nobleman paid his respects, and inquired the reason of such thrifty vines and rank foliage, when mine look so puny. O, said the young man, this is all chance. Chance, replied the nobleman, that can not be. Then the gardener related how by a mere accident he heard two men talking about the value of charcoal, and among other things that it was good plant food, and then I borrowed some books and read more about it. So you see it was all chance to me. The nobleman returned home more mortified than ever at the sickly looking appearance of his grapes; he summoned his gardener and related to him what he had seen and heard. Well, said his gardener, that is nothing new. Prof. Liebig has taught all of this before, and I knew all about it. Did

you try it on my vines? I can't say I have; it did not chance to come into my head. Nay, replied the peer, chance put it into your head, but thought never took it out. This is a plain lesson. However valuable science may be, it can not do all for us. We must have well directed thought. And observation guided by science, will put us on the right track to work in harmony with nature's laws to more succsssful results with our methods.

DISCUSSION.

Mr. H. Z. Fish — In what way can you sow clover on old soil without ploughing it? Also, wild land that has been cleared off this winter and burned over; what is the best method for seeding it into clover?

Mr. Allen — Well, sir, I should go to work and plough it over, and prepare it for seed, although if you want to harrow it, you can do it; all land that clover is expected to grow upon. It is desirable that it should be covered up, not more than one-half to one inch deep, but it should be covered up and the soil pressed around the seed.

Mr. Hoxie — I should advise everybody to sow clover seed early as they could, even on the snow, but I would advise to put it more than half an inch deep. The best crop I ever had, the man sowed right on the furrow, as it was left by the plough, but I would advise a full inch, rather than half an inch, and if some of it is too deep, it will come up next year. One of the best farmers I know, who has raised 300 bushels a year, puts on the seed and harrows it in; just as he does his oats, or his wheat.

Mr. Allen — I came into possession of a piece of land in Adams county, and I had to do something with it, and I tried various methods of seeding that land to clover, but I never succeeded until it was covered up with a plank, like this one I have here.

Pres. Morrison — Have you ever used any salt or land plaster or gypsum, in order to get a good catch on sandy soil.

Mr. Allen — I am a regular plaster crank. I am asked

my experience on Alsike clover. The only objection is, that on strong land, you can not mow it, without a great deal of trouble. It makes good hay and good pasture. Sown with clover, I think it will do very well. My experience is that a mixture of grasses is very much better than clover alone. Blue grass, orchard grass, and clover will make the very best pasture.

Mr. Webster — Some five years ago, a portion of a farm of mine was seeded to clover. It looked very fine in the spring; there came a cold spell, and it was completely killed out. I ploughed what I could in a quarter of a day, and I put potatoes in every third furrow. There was probably a little over an acre, and I planted and cultivated it, and harvested 300 bushels of potatoes, from that land, and it cost me altogether $21; seven cents a bushel. I have kept count on other land, and it cost me thirteen cents.

Mr. Gurler — I have learned that clover meadow planted to corn, will yield ten bushels to the acre more than any other soil.

Mr. Allen — As I told you I am a regular clover crank. I have been making experiments with clover for twenty-five years, and plaster if sown with the clover will help it to secure a good catch, and will be strong in the land for three years. It will make you a good catch, and then the next year it will secure a good strong growth of clover.

Mr. Cheever — Do you think that this gypsum on rich prairie land would have as good an effect as on your sandy land?

Mr. Allen — No, sir; it won't do any good on prairie land, there is lime enough in prairie land.

Mr. Smith — Ten years ago I bought a little farm in the woods, and I broke it up, and that year I raised five hundred and twenty bushels of wheat on it. The neighbors all said I was going to ruin my farm. One year I raised clover, but with the exception of that year I have never raised less than five hundred bushels, and last year I raised over seven hundred bushels of wheat and four hundred bushels of oats, on that little hole stuck back in the hills, and there has been nothing but clover to keep up that land.

Mr. Gould — It depends a little on how big that hole in the hills is. How large is it?

Answer — There's about fifty-five acres under cultivation.

Mr. Hoxie — Mr. Rogers, have you had good success in sowing land plaster on your land?

Mr. Rogers — Yes, I have. Some twelve or fourteen years ago I bought a farm up here, that was said to be worn out, it was a very poor farm. I sowed a twenty acre piece to wheat and oats, and I got about seven bushels of wheat to the acre and about fifteen bushels of oats. I sowed clover seed the next year, and sowed eighty pounds of plaster at the same time, and the clover came up good but it didn't grow. The next spring I went over there and it looked very dull, I just went and put on one hundred pounds more plaster, and there never was a larger crop of clover grown in this county than on that piece of ground. I think it cut two and a half or three tons of hay, and the second growth I think they got five bushels of seed to the acre. Now, another thing, my seeding timothy entirely died out, and where I had my wheat I sowed it to timothy, and put on a common drag and dragged it in well, and it didn't come up. I kept watching it, and I concluded my seed wasn't good. Then I took my potato patch and sowed that down with rye and put in my horse rake and just run over it, and I never saw so pretty a catch. I concluded I got that timothy seed in too deep. I know that clover will lay in the ground ten years if it is deep in the ground.

Question — I want to know the best methods of sowing plaster?

Answer — The way I sow it you can sow about eighty acres a day, if you take three men, one to drive, and one each side and a boy to fill up the kettles. You keep driving right around your piece.

Question — There is one objection to sowing plaster and that is the dust and dirt?

Answer — Yes, you get your face dirty, I know.

Question — There's a good many claim that plaster does the best when the clover is a couple of inches high?

Mr. Hoxie — That is all humbug.

Question — What is the best plaster?

Mr. Hoxie — They are all good. The Grand Rapids plaster is good. The Fort Dodge plaster is only two per cent. poorer.

Mr. Hunt — It is a question of considerable importance to me just how to sow these fertilizers, and just about how much to sow to the acre. We, as farmers, have advertisements thrown before us continually as to implements to sow this very stuff, and among the rest is the Strowbridge; does anybody know anything about it?

Mr. Allen — A good machine, sir.

Mr. Jones — Wood ashes is one of the best fertilizers we have in our reach, and every backwoods farmer makes it. If he will carefully save his wood ashes in a proper place, he will find it valuable. Run it over a screen, so that your charcoal will go off one place and your ashes in another.

Throw your charcoal into your hogs, it will prevent a great deal of disease among them. Mix your ashes and salt and plaster each one-third, as near equally as you can, and scatter it on your timothy, and it is an excelldnt fertilizer for timothy.

President Morrison — Professor Roberts in one experiment found that in sowing one bushel of salt and one bushel of plaster upon an acre of ground, that there was in solution within four inches of the surface, fifteen tons of surplus water, which is a wonderful sight to be upon an acre of ground in the first four inches, and that is one reasen why we can take salt and gypsum and get a good catch upon sandy soil.

Music — "Old Mother Hubbard" — Ladies' Quartette.

GRANULATED BUTTER.

BY JOHN GOULD, AURORA STATION, OHIO.

The present method of granulation of butter may be set down as one of the most valuable features yet introduced in butter making, and where practiced, has produced a marked improvement in this product of the dairy.

It is now ten years or more since the introduction of this method, and it has made steady progress in popular favor, but thousands of butter-makers still continue to make by old methods, preferring to gather the butter in the churn into large lumps, or balls, and work out the buttermilk by mechanical process. These same persons claim that washing butter not only washes out flavor, but blanches color, impairs the keeping quality of the article, and often gives the butter a porous, and spongy character.

These objections seem to be fully refuted by the best butter-makers, who now are adherents of the granular system, and attribute much of their success to following it. The rules are very simple, and no one need hesitate, for fear of a complicated process, to try, and prove whether the new system is not only a great saving of labor, but also a means of obtaining most positive and better results.

The best method to obtain perfect granulation, is to have the cream well aired, and churn at the first stages of acidity. Cream should, if possible, be churned every day in summer, and at least every two or three days in winter. It is also best to churn at a point as low as possible, especially limpid cream, which may be classed as cream somewhat sweet in character, while if the cream be tough and tenacious, a higher degree will be needed. Major Alvord found that the range for creams of all kinds and conditions, to obtain best results at the churn, was from 55° to 70°, but cream in proper condition can be churned with satisfactory results as low as 50° to 52°.

As the butter assumes a distinct form, the process of granulation should commence. As soon as the grains of

butter are the size of small shot, a quantity of cold water, in which a little salt has been dissolved, should be added, enough in quantity to cool the mass down to 55°, which seems to be about the point where hardening of the globules can be carried, and not prevent cohesion among them. The lower the temperature, the more force is needed to make the butter compact, and it may be made so low that the butter will be dry and crumbly, a matter that should be avoided. The use of salt with the first separation is now recognized as an important aid; the salt seems to "cut" the buttermilk in some way and produces a cleaner separation of butter from the buttermilk than can be secured with water alone. The granulating process should be so conducted that the gathering of the butter in a mass shall be prevented as much as possible, for herein lies the full measure of success. If we churn so as to gather the butter in lumps in the churn, the butter has also inclosed a large per cent. of the albuminous matter or buttermilk, and while in working over, a part of this fluid, (casein and sugar), may be expressed, yet a part remains encased, as it were; and the working over is but to divide and subdivide it so as to make it invisible. This, then, is clear, that the nearer we can get to keeping the granules separate during the stage of washing with brine, the more nearly we shall accomplish our purpose in freeing the butter from buttermilk, and exchanging this buttermilk moisture of the butter for one made of pure water and salt.

To how many washings granulated butter shall be subjected judgments differ, but if a little salt is used each time, it is safe to repeat the operation until there is no showing of milk. Lately there has been much discussion about how granular butter shall be salted. As no butter-maker now advocates using more salt than will readily dissolve in the butter by its own moisture, it then stands to reason that all we can do for butter is to put it, while in the granular stage, in a bath made of all the salt that water will dissolve, and allow it to absorb this saturation, filling the interstices among the globules with the dissolved salt. To do this effectually, it would be best to first allow the butter to drain

as freely as possible before the brining process commences, so there shall be as little weakening as possible of the last salt solution.

It may be urged that this washing in two or three waters takes more time and labor than to work by old methods. To do good work, a person needs tools adapted to the requirements of the case, and so the making of the granular butter is best done in some of the forms of revolving or rectangular churns. By their use the agitation needed is done by one or two turns of the churn. If a little salt is used with each washing it produces a greater difference in the gravity between butter and the caseinous matter, and if quite an amount of water is used the butter, after the agitation, quickly comes to the surface, and the buttermilk or brine wash is then at once drawn out from beneath the butter, and is as quickly renewed. It is always well to have the temperature of all the washings at about 55°, as a *warm* bath is liable to give the butter a shiny look.

The salting may be done by incorporating salt and working it into the butter, setting it away to dissolve before working over, or it may be put into this bath of strong brine, where it remains for an hour; but it needs a little agitation occasionally, as the tendency of the butter is to rise above the brine, and the object is to coat each little globule with a film of salt, and when the working over takes place the brine fills the places once occupied with buttermilk. This brine should then be withdrawn, and made a little stronger by adding a little salt, and returning this to the churn allow it to remain a few moments, it is ready to work over or pack. It is said that brine-salted butter is not salt enough. It is certainly as salt as butter salted by any process that does not contain more salt than is readily dissolved by the butter. Any salter butter must be full of undissolved salt, and that would not add to but rather detract from the keeping quality of butter.

With granulated butter, whether brine or dry salted, there should be very little working over — just enough to press out the unneeded moisture. Some makers put this butter on a worker, and with a flat lever press it into compact form and

then pack. In brine salting, it is possible to take the granular butter out of the bath, and by putting a small quantity into the package at a time, work it over sufficiently by the one operation of packing. But the "potato masher" used for that purpose should never be turned or twisted in the butter but rather pressed down, and the moisture removed by a damp cloth which is frequently rinsed out in the brine.

To sum up, the advantages in brief for granulated butter are: There can be no injury to the grain of the butter, or "salving;" working over butter is practically avoided, and the butter is rinsed free from buttermilk, obviating the mechanical part of expelling it by force. The injury liable to be done by coarse salt cutting the grain of the butter can not happen and the salting is even, taking on color alike by the action of the salt, the butter is also evenly flavored, and not liable to be streaked. It holds the temperature of the butter uniform during the granulation, and the grain is not liable to be injured, as where butter is allowed to get cold, and then has to be "warmed up" to work. I think the whole process is in the way of substantial progress, and can only be opposed by those who by long association have acquired the taste for buttermilk flavor in butter.

The convention adjourned to meet at 7:30 P. M.

EVENING SESSION.

FEBRUARY 8th, 1887.

Convention met pursuant to adjournment at 7.30 P. M., Mr. Beach in the chair.

Music. — Double Quartette.

HOW TO MAKE DAIRY BUTTER OF A QUALITY EQUAL TO CREAMERY.

BY MRS. E. S. ROBERTSON, VIROQUA, WIS.

Dairying as carried on at the present day is one of the most important and successful branches of farming. By the system of cropping without fertilizing, as pursued on

most grain farms, the robbery is very apparent to the beholder in every thing — in the fields, the buildings and fences — even the man himself has a "don't you come near me" air, while the poor, half-frightened cow who stealthily makes her way over, under or through the apologetic fences, is ever on the alert for the dog or beating that is sure to follow her every attempt to get a fresh bite of the growing grain or her living in anything but a starved pasture. Contrast her with your dairy neighbor's cows, that stand knee deep in clover lazily chewing their cuds in a "don't care whether school keeps or not" manner. You approach them, put your hand on one, she turns her great eyes toward you and seems to say, "If you want to go by me you must turn out yourself I am immovable." I am petted, caressed and catered to like the very queen. I am of this domain at least, and for all this I give you in return veal, butter and cheese, and I finally yield up my whole body for beef. The result of her work is every where visible. In the rich fields, the substantial buildings and fences. She supports a home wherein her owner, as a practical farmer has expressed it, "takes more comfort to the square inch than any Wall Street operator or bloated bond-holder." A home where, if his heart is in his work, the man with a trained mind and skilled hands will banish all drudgery, one whose enthusiasm will surmount all difficulties and who will inspire his help and all that come in contact with him, to work with a will, producing very different results from the same work done by compulsion while, in constant companionship with his faithful friends (the older ones winning added respect as their value is realized, the young ones, from the very care they make him, becoming objects of tender interest) the years devoted to dairy farming will pass more rapidly than those of any other years of his life and he will find himself asking for more time and strength to devote to it, his great danger lying in the fact that his ambition carries him unconsciously into excessive labor that benumbs his thinking faculties, forgetting until reminded by an ache here and there, that he can not make brains and hands work successfully at the same time.

Work, steady faithful work, with head and hands and heart, is the key to success in dairying. We must throw ourselves into the fight with well-considered judgment. We must know that why those in other kinds of business succeed is that they take advantage of every circumstance that can be brought to favor them. We know that it is only in excessive production, in the greatest economy and in the utmost activity of exchange that the possibility of great success lies, and the farmer must not only work with all his mind and all his strength, but he must work for the love of money, and as only the love of money can make him work. In manufactures, the helpless men have become the operatives, in trade they are the broken down clerks, in farming they are the hand to mouth farmers who count for just so much as their labor is worth and no more. We can do nothing for them but try to help them to sufficient energy to wake up and help themselves. The time is not far distant, I hope, when those women who are now suffering from wasted energies by monotonous toil at the needle will awake to the fact that they should have just as good an education for the practical affairs of life as a man has, and will take up this work of dairying as the most profitable and healthful of any they can engage in. The history of nearly every patriotic state in the Union abound in incidents of young women who, during the rebellion, usurped by necessity the rights of fathers, husbands or brothers who were at the front, and not only directed the operations of the farm, but carried on the various processes in person, and the cases are not rare here in the west of women now managing and cultivating farms as a pursuit more agreeable to them than in-door employments, and taking into consideration the machinery by which farming is now carried on, the comparatively slight amount of severe manual labor requisite, and which can be hired for the emergencies, makes the labor less severe than that of many other trades.

Our climate is a pretty tough one, but like every other brave enemy so often a friend in disguise, the only way to conquor it, is to meet it boldly. None suffer so little from the weather as those who are out in it every day and all

day. The great danger is in staying in the house by the stoves and hot air register, and not out in the east wind or northeast snow storm. The successful farmer of to-day has learned that he can not compete with the cheaper lands west of us. He can not grow beef as cheaply as it can be raised on the great grass ranges of Texas, Colorado and Kansas, and so he has turned his attention to dairying and to producing animals that will give him twice the butter that his scrub cows do. When such cows as Jersey Belle, Eurotas, and Mary Anne each give their owners from twenty-two to thirty-six pounds in one week, one on pasture and five pounds of ground oats daily, while the highest grain feed of Eurotas was only eight quarts for any one day during her whole year. These and over one thousand Jersey cows that have been tested and found to produce from fourteen to forty-six pounds of butter in seven days, the most of them on moderate feed and not on the high pressure plan of risking the life of the cow, ought to convince us of the wisdom of the man who turns his attention from growing beef to dairying.

Mr. Sibley, of Penn, says that he has some poor cows in his herd, but that no man can pick out of it two cows that can not make over 365 pounds of butter in one year, and that any herd of average excellence can do as much or more. None of us can obtain such cows at once, perhaps, but any of us can place at the head of our herds of the best native cows an animal from a family of exceptionally rich milkers that will transmit the excellencies of his dam to his offspring. In this way we can by selecting cows that are free milkers and that hold out well before drying up, obtain most valuable herds. In winter I provide them with warm quarters made of boards, battings and tarred paper, that for the money will be the cheapest material to be had. Have closely fitting windows to admit sunlight, and provide good ventilation some say, though I've never found any trouble with bad air during most of our winter weather. I would give them bedding of straw, knee deep on cold nights, and would feed them to their fullest capacity for butter yielding but the instant you pass that point the loss begins, not only

in waste of food but in actual damage to the cow. Only the most careful and intelligent help should be allowed to do this work. The water should be kept fresh in windmill tanks, and they should be induced to drink all that it is possible to. It should be warmed in winter as the influence of drinking ice cold water is lasting, and many fine cows have been ruined in that way. A draught of it in winter cuts short the milk yield from one to two pints.

A not less important work is to get good milkers — intelligent workers with their eyes and ears open, who put themselves right in sympathy with their cows thereby gaining their confidence and the last drop of milk in them. It should be strained as soon as possible through a fine wire strainer covered with double dairy muslin into tall slim cans. The object being to bring as much surface of the warm milk to the cold water as possible. It should remain in the cold water twelve hours, then skimmed and the cream ripened for churning. Ripening the cream is one of the most important and troublesome operations of butter making. By the old way of setting in open pans, the cream often remains on the milk too long, and then again is skimmed too soon. No matter how hard you try, this variable climate will upset all your calculations, some of the cream will be just ripe enough to churn, when you skim it, some not ripe enough. You must either let some get too ripe or lose much of that not ripe enough, so that by standing over it constantly one could not make a tub of butter of uniform quality, and it is just here that creamery butter gets ahead of the dairy make by the open pan system, by the submerged way the cream is dipped off sweet and cold of even consistency, not leathery and tough, then set away in a cool place until enough has accumulated for a churning, then all warmed and ripened together. For ripening, a cream closet can be made with little trouble, that will be an immense help. It can be made 13 inches square on the inside and about 5½ feet high, with close fitting door the whole length, with 16 inches from the bottom to the first shelf. In the bottom place a can of hot water, on the shelf above the pail of cream that has previously been warmed

up to a little higher temperature than that desired for churning, doing it by gradually making the water warmer in a large dishpan in which sets the pail of cream. When it is warmed way through the warm water beneath it will keep it just about right for the twenty-four hours it must stay there to ripen.

You must not forget to stir it frequently until it gets warmed through as cream is a very poor conductor of heat and it must ripen evenly or it will not all come to butter at the same time. As soon as it shows signs of acidity put it in the churn and churn it. If you haven't a churn without inside fixings that brings the butter by dashing the cream from side to side, get one. You can not be too particular that your cream is at just the right temperature all the way through before putting it in the churn. The exact temperature is 64 degrees by the thermometer. You will see it stated all the way from 60 to 68, a difference accounted for by cheap thermometers. If your churning is not satisfactory at 64 you may know that it ought to be higher or lower according to your thermometer if it is not just right, don't try to warm or cool it rapidly because it can't be done. It will not do to overlook the proper color either. If you make it a bright June color the year around you must use color. Put it in the churn with the cream, how much will depend on circumstances. You will have to use your very best judgment not to get enough to show that it is colored and yet enough to look well. You will also have to be careful to have the different churnings in the same tubs exactly alike or you will realize 3 or 4 cents less per pound for your butter. I had an experience in that way myself. I had become possessed of the idea that I was making such a good article that never received anything but praise from the buyers, that I could safely leave it in other hands and on the strength of its reputation go away from it a few days. The returns from what was made at that time was accompanied with an inquiry asking what was wrong about the butter, had I been buying speckled cows? That only reminded me that too great prosperity leads to indifference and that only the most faithful work will answer for dairying.

Careful attention to another point will save labor and make better butter if you stop the churn as soon as the particles of butter have formed about the size of wheat kernels. You can then draw off the buttermilk and wash it so thoroughly that it will require very little strength to work it, if it is necessary or desirable to work it at all. I wash twice with cold, salt brine, then float in a weak brine of about 55 degrees for a few moments. If not particular about the temperature of the last washing, the butter will be too cold to make together conveniently and make it difficult to handle. When you have drained it thoroughly, sift over it a half ounce of salt to a pound of butter. Let it remain a short time to dissolve the grains of salt, then turn the crank several times when it will be massed together and quite as evenly salted as hand-working could do it. Do not let the lever or ladle go over with a sliding plastering motion You may squeeze or pound it with impunity almost, but every time you rub it over, you spoil as many grains as you touch and so much of it is no better than oleomargarine. For packing, use the best made, best looking ash tubs you can find. Scald out with hot water, soak with strong brine twenty-four hours, turn that out and fill to the brim with scalding hot brine, let cool and your tub is fit for use. Pack as solidly as possible, cover tightly and set in a cool place until ready for shipping.

Most of the older butter makers think that you take all the flavor out of butter when you wash it, little dreaming it is not the taste of butter at all they are so fond of but simply butter milk, others scald and even boil their buttermilk until all the delicate flavoring oils are dissipated, and nothing but a tallowish grease is left. You will hardly find two farmer people who will think the same sample is first-class. But when you send it to a great city you may be confident it will be graded about right. There is too great a demand for strictly first-class butter for a commission man to let it go for less than best prices. He will want more too badly, but of course he can not get more than it is really worth, you may be sure of that, and you may be sure also that if you feed rightly, keep the barn free from smells by dusting the

floor daily with plaster, that if you are very careful to keep everything about the milk and cream perfectly sweet and clean, that you churn it as soon as it is perfectly sour and is of a proper temperature, that you stop churning as soon as the butter forms in small particles, that you wash thoroughly in strong brine, salt and work lightly and pack it in sightly, properly-prepared packages, and keep milk, cream and butter away from the air as much as possible, you can not fail to have butter of a high-priced flavor that will command creamery prices and may be termed "Dairy butter in a quality equal to creamery."

DISCUSSION.

Mr. Gould — Mrs. Robertson, to what point would you warm the cream in winter to get the proper ripening?

Mrs. Robertson — I warm mine to sixty-eight or seventy, and then let it cool down to sixty-four by my thermometer.

Mr. Gould — Would eighty degrees hurt it?

Mrs. Robertson — I have never tried it to that point. I think about seventy is right.

Mr. Gould — I was much pleased with one remark you made about scalding good milk. I think it is one of the abominations in butter making.

Music — Male Quartette.

CLOVER AS A FERTILIZER AND DAIRY FOOD.

BY STEPHEN FAVILLE, DELAVAN, WIS.

The value of clover as a fertilizer is so well known and so generally admitted by our best farmers, that it seems to me to be unnecessary to take any time to discuss that question, but rather direct our attention to which of the clovers is best, and the best manner of using it for fertilizing purposes.

The kinds of clover best known to us are the White, the Alsike, the Medium Red and the Mammoth. So far as I know, the Mammoth is considered the best as a fertilizer, but not the best for feeding, and as the Medium is nearly as good as a fertilizer and much more valuable as a forage crop, I would recommend it in preference to either of the others named.

Then comes the question how to use it. The answer to this question will depend upon the condition of the soil. If the land is very much worn or poor naturally, I would advise plowing under one or two crops. But if our land is in fairly fertile condition, it may be kept so by sowing clover with every crop of small grain, and the first crop may be cut for feed and the second plowed under. In that way the land may be kept in good condition. Chemistry tells us that the clover may be fed to stock and the manure returned to the land, and almost as good fertilizing results be attained as when the whole is plowed under. My space (I am limited to 1,000 words) will not admit of my going into the chemistry of clover as a fertilizer, and I don't know anything about it if it would allow me to do do, but I do know of the *results* of sowing clover, and so shall tell only what I know and leave speculation for those that have more time to devote to such matters. The plan I propose will necessitate a rotation of crops. My plan is a three year rotation. First clover, with all the munure put on in the fall that I can get. Take off one crop for hay the next season, then if my land needs it I plow in the second crop, but if the land is in good condition, I cut the second crop for feed (or seed) and then plow in the fall for corn the next season; then followed by barley or oats, and again seeded to clover. My reason for this plan is first it gives me a large crop of the best kind of hay; and secondly, it puts the land in the best possible condition for corn — the soil loose and frliable and no danger from cut worms or grubs, and then followed by barley or oats, as before stated, has been entirely satisfactory on our farm, and our land is growing better all the time. The question may be asked how to seed so as to insure a good catch. The plan followed by our best farmers on Rock

prairie is when they use a broad cast seeder, the seed is mixed with the grain and all sown together; when a drill is used it is sown by a grass seed attachment following the drill teeth, and then followed by the harrow and roller. And on all sandy or clay soil, I would recommend sowing (immediately after seeding) land plaster (gypsum) and salt; 100 pounds of each to the acre. This will greatly aid the young clover, especially if the weather is dry, and I think will be of some benefit to the grain crop. Note, I recommend the plaster and salt only for sandy or clay soil. I have never been able to see any good from them on our black prairie soil, especially the plaster. The time allotted me will not allow me to attempt to give the whys and wherefores ot this business, only to give plan and results, and I repeat the above plan of rotation of crops with clover will almost surely result in maintaining the fertility of the soil.

I would add incidentally the more manure we put on, the better will be the results. This brings us to the consideration of the second part of our subject, viz., the value of clover as a dairy food. Its value as dairy food will depend largely upon the manner in which it is handled. If left to stand before cutting until it is nearly ripe, and then left to lie in the sun and dews of night until it is thoroughly dried, it will be of very little value as feed. But, on the other hand, if cut when it is green and left in the sun only long enough to fairly wilt, and then is put into the silo or into the mow in a tight barn aud let the curing go on there, it is the very best of dairy feed. I know that many of you will say if clover is put in green it will heat and spoil, and will set the barn on fire and all that sort of thing, and I say to you it will heat and that is just what we want it to do. The heating neutralizes an acid there is in the green clover and somehow makes it more palatable for food. If the barn is reasonably tight, the heating will not go far enough to hurt it or to endanger the burning of the barn. But please do not fall into the error of thinking that because clover may be put into the barn green with safety that it may be put in wet. The juice of the grass is one thing and water

another, and if there is foreign water in it, either in the form of dew or rain, it must be dried out. My plan of handling clover is this: Start the mower in the morning as soon as the dew is off; cut till noon. Stir it up once with a tedder and it will be ready for the barn by three in the afternoon, or when there is a large amount to be cut the mower may be run in the afternoon (stopping before the dew begins to fall) and that will be ready for handling the next forenoon. When the clover is put in in the way I am advising, when it is all in, it will be necessary to cover it with some dry hay or some dry straw or some of the top will be spoiled.

If clover is to be put in stack, it must be dried a good deal more than is necessary when put in barn.

I am inclined to the opinion that the coming way of preserving clover hay will be in the silo. I have filled a small one this season which has proved fairly successful. So in every respect only where we were in fault in the filling. The silo plan has several advantages, one of which is safety on account of wet weather. All know how frequently it happens that when we have hay ready for the barn the showers interfere with all our plans and the hay all has to be handled over and dried, only perhaps to be caught in another shower.

With the silo this risk is all saved, and then again the same store room will hold twice as much, and the silo feed will be just the succulent ration needed for successful milk making in winter.

DISCUSSION.

Question — Did I understand you to say that in an average crop of clover, five hours would be sufficient to prepare it for the barn?

Answer — Yes; it just wants to be thoroughly wilted, not dried. You have seen the green clover just as you take it in your hands and can wring the juice out of it; you want to dry it just so it won't wring.

Question — I remember once I put my clover in, and I

hardly thought it was in proper condition to put in, and it heated, perhaps two feet on top was entirely lost. On every straw there was a particle of water, so that by passing your hand over the top of the mow, it was like dew on grass, but I din't know how to overcome that part. If I had put straw on it perhaps I would have saved most of that hay.

Mr. Faville — You would, sir. There is a moisture comes up on top and there isn't heat enough to dry it, and if you have straw to catch that moisture, the hay will be all right underneath.

Question — In putting in your silo, did you cure your clover any more than to put it in the barn?

Answer — No, not as much. Cut it down and put it right in. Some of it got wilted a little, and some of the time the mower would be running and the team drawing at the same time.

Question — Do you feed corn at the same time, ensilage corn?

Mr. Faville — No, sir; we haven't any. The clover ensilage is pretty much fed out.

Mr. Gould — Isn't it true, that if we cover our clover over so that the air will not get into it, that will be better than putting the straw on top?

Mr. Faville — Yes, boards would be better than straw.

Mr. Gould — You are burning up your clover because the evaporation is going on all the time. If you keep off that evaporation, I think your clover would be in the same condition as when it went into the mow. In the silo the warm air rises and there must be an inflowing of air from the outside which makes a current of air all the time, and it burns up the carbon in the air, like burning up wood. If you can stop that admission of air, you can stop the burning.

Question — What stage of ripeness do you cut clover?

Mr. Faville — If I had much to cut, I would not wait until it was all blossomed, because the last would be too ripe. If I had about what I could do in one day, I would wait until it was mainly in blossom and then cut it. But where there is forty acres and only two or three men to cut it, you have to cut it along, and then the last is a little too old.

MAKING AND MARKETING BUTTER.

BY J. W. SMITH, SPARTA, WIS.

Mr. President, Ladies and Gentlemen: There has been so much said about making butter that I will confine my remarks to my own experience. In the first place you must have good cows, take good care of them, treat them kindly, do not let them stand out around the straw stacks and shiver and tremble day after day, as there is too great a loss by so doing. Give them the best possible food you can, I prefer corn and oats ground together with about one fourth wheat bran, and plenty of good hay or corn fodder. A fat cow or one well fed always gives the best milk, you can not get good rich milk without good rich food. Next furnish a good brook well or spring water to drink; as a large per cent. of the milk is water it is very neccessary that the cows have pure water to drink. Be clean about the milking, never wet the teats, it is a very filthy habit with some; use no pails or milk vessels made of wood. I prefer tin always, have them well scalded with hot water and made perfectly sweet and clean. Be very particular about straining the milk, always use a double strainer. Set the milk in deep setting cans. I use the Smout can with pure spring water flowing over them all of the time; it is about forty degrees when not crowded for room; let it stand twenty-four hours, stir the cream well together; when it becomes acid or ripe, churn; have it sixty to sixty-four degrees; when the butter comes and the granules are the size of small wheat kernels stop churning, draw off the buttermilk, wash clean with pure water, handle carefully so as not to injure the grains of the butter, salt to suit your customers, and as soon as the salt is well dissolved in the butter, work and pack. I use the barrel churn and lever worker.

MARKETING BUTTER.

Always use neat, clean packages, as it always adds to the price. Never ship a package of butter that you are ashamed to own, or put a tag on with your name on as the maker of

the same. I have marked every package of my butter for the last eight years. Always market the butter as soon as possible after it is packed, as all butter loses more or less of that nice flavor after two or three weeks. I have tried several ways of marketing butter: First, the commission man, which took too much of the profits, the freight, cartage and commission, and always a shrinkage of from one to four pounds per package, and all this all comes out of the producer. Next, the retail grocer of Chicago. At first it was all right, but they soon got to beating me on the price; and now I will tell you how I caught them at their tricks, as they had been saying the butter was off, and I knew it was not. My wife and I went to Chicago and I went to the grocer and I played the role of buyer, I wanted to buy some good and pure butter and some that he could recommend; as such, he showed me some of my own butter and said he never had any poor butter from the man he got it from, he said he got it from a farmer in Wisconsin, and it cost him 28 cents per pound, when he was only giving me 16 cents. I then handed him one of my cards, and you may imagine the scene that followed.

Next, I shipped to a man who dealt expressly in butter. This was all right until he went out of the business, and then I thought I would have to turn back to the commission man again, but some of the families that had used our butter wrote to me to furnish them direct, this came by marking every package. At first this was very unsatisfactory, as they were not always prompt in paying and I let some of the bills run too long, and then it was hard for me to get my pay. But now I have a new plan, and it works well, or it has at least, for the last four or five years. I furnish the families direct but never ship the second package until I get pay for the first, and I always try to please them in the butter. Some of them want it very salt while others want it very fresh. We have some customers that only want eight ounces of salt to twenty pounds of butter, which makes it very fresh after working. We can not supply the demand at our price which is 25 cents per pound at the express

office at Sparta. By pleasing one customer it always brings another. I pay no freights and get pay for part of my packages.

Music — Home, Sweet Home — Mixed Quartette.
Convention adjourned to meet at nine o'clock next day.

MORNING SESSION.

FEBRUARY 9th, 1887.

Convention met pursuant to adjournment at 9 o'clock A. M., President Morrison in the chair.

APPOINTMENT OF COMMITTEES:

The president appointed the following committees:

RESOLUTIONS —
W. D. Hoard, Fort Atkinson.
R. P. McGlincy, Elgin, Illinois.
John Gould, Aurora, Ohio.

DAIRY UTENSILS —
H. B. Gurler, De Kalb, Illinois.
H. Z. Fish, Richland Centre, Wis.
George A. Austin, Neillsville, Wis.

DAIRY EXHIBITS —
C. F. Dexter, Chicago, Ill.
C. H. Potter, Elgin, Ill.
Chester Hazen, Brandon, Wis.

ON NOMINATIONS —
C. R. Beach, Whitewater, Wis.
Stephen Faville, Delavan, Wis.
J. A. Smith, Cedarburg, Wis.

A SHORT TALK ON BLUE GRASS.

BY D. R. MCGINNIS, ST. PAUL, MINN.

The interest in the cultivation of the tame grasses and the area devoted to their growth in the northwest, is as a result of the increase of the dairy interest and of the animals kept, rapidly becoming greater every year. This is as it

should be, for it means that the fertility of mother earth is to be maintained combined with an increase profit over old methods. But the grasses that we raise are not in sufficient variety. Why should we utilize two or at most three varieties when we have a dozen, or fifteen which in this climate can easily be made to contribute to our profit Timothy as a hay for winter feed, especially for horses, has its champions, and Red Clover stands in deservedly high estimation both for grazing and winter forage. These two grasses, for in this paper for convenience we will consider clover as a grass, are not the only ones on which the grazier can rely for pasture or forage. There is one grass, the blue grass, which has bravely and persistently tried to obtain a foothold in our pastures, but which I am sorry to say, if not by the majority, looked upon with indifference, is classed by many in the category of noxious weeds. If as I am told a number of farmers at an institute lately held in one of the best and most prosperous counties in Minnesota, asked advice as to the best method to get rid of this persistent benefactor to the race, as a nuisance, surely it is time to make an effort to define its true character; that of being by far the best grass for permanent pastures known in temperate climates.

Blue grass belongs to a large family of grasses known as the "Poa" family. Its botanical, scientific name is "Poa pratensis" which is the only thing I have got against it.

It makes a thick, close turf and if grazed closely will run out all other grasses with which it may be growing.

It is propagated in two ways, by its seed and by its creeping underground root stalks. It is among the first, if not the first grass to start in spring and if the fall be moist will grow until from the 1st to the 15th of October. If not too dry, the climate can hardly be too cold for it to flourish, as it can perpetuate itself by means of its creeping root stalks where the summer is too frosty to ripen its seeds, and is known to do well near the Arctic Circle in British America. It can not endure great and long continued heat and its southern limit may be roughly defined as the latitude of Cairo, Ill., though it grows well in the elevated limestone lands of middle Tennessee.

Blue grass is rather difficult to get started and a good set is hard to get in less than four years from the seed sown, but under constant grazing it improves for years. Many of the best pastures in Illinois and Kentucky being on land never as yet insulted by the plowshare. It is very difficult to get a stand from imported seed as its germinating qualities are quickly ruined by mold after it is cut. In Illinois the safest way used to sow it, is to cut it stalk and all, scatter it over the ground to be seeded. It can be sown at any time not later than August during the growing season.

Blue grass in Wisconsin will do well on either clay or sandy lands, but of course will thrive best in limestone districts. To get the greatest benefit, pasture it rather closely. If it grows up tall and falls down, it is apt to become weedy. This grass is without question in its green state the most nutritious grass known. Illinois farmers consider clover to be "washy" and infinitely prefer blue grass to it for both milk and beef.

Here is the secret of the bone and style of the animals raised in Kentucky, and farmers of Wisconsin, you can raise it as well or better than Kentucky, for your soils in general are as good, and climate more favorable for its production. One might as well offer to rob an Illinois or Kentucky breeder, as to ask him to break up his 10, 20 or 40 year old blue grass sod. The Brown Bros., the great Short Horn breeders of Morgan county, Illinois have 4,000 acres in permanent blue grass pasture, and they are but one of hundreds of others who follow the same policy. If the stockmen of those states can afford to devote $50 to $75 an acre land to blue grass, surely Wisconsin with its cheap lands can do the same. Blue grass will produce milk in quantity and of a quality impossible to get by feeding any other food, green or dry and will give a form and produce that harmonious relation of the different parts of an animal to each other, giving a style and perfection not possible to have in any other way.

DISCUSSION.

Mr. Hoxie — Have you any facts to present, showing how long blue grass seed can be kept before its germinating powers will be destroyed — can you tell us the life of the seed?

Mr. McGinnis — I do not know, but I am sure of this much, that its germinating qualities will last for one year, if it is not allowed to mold. But it is almost impossible to get blue grass seed from the Southern states without its beginning to mold. The amount to sow per acre is about six pounds. It weighs fourteen pounds to the bushel, and you usually get it at a net cost of from $1.25 to $1.50 per bushel, laid down here. There is no question at all but that a great many of our noxious grasses, that is, grasses of no benefit to the grazier, have been taken for blue grass, and thrown it in disfavor. Blue grass in these cool, rainy summers will thrive on any soil.

Mr. Faville — Is what we call June grass the same as Kentucky blue grass?

Mr. Hoxie — It is Kentucky blue grass.

Mr. McGinnis — I will tell you a good test to apply. Blue grass is the easiest grass to kill, known. More so than clover; more so than timothy. I want to say another thing, I think a great deal of clover because it is one of the most valuable of our grasses, yet I have no doubt at all, from my personal experience with clover and with blue grass in Illinois, that blue grass is even a greater fertilizer of the soil than clover, and that is saying a great deal; another thing, you can plough your blue grass sod in to-day (which I hope you won't), and plant it to corn to-morrow and the blue grass will never interfere with the crop in the least.

Question — How deep do blue grass roots run in the ground?

Answer — I know blue grass roots are very fine, almost as fine as threads of silk, but they are unquestionably to be found penetrating two feet and a half below the surface, if not farther. Perhaps in sandy lands they would not penetrate so deeply, my experience with blue grass is

on heavier soils, but do not be afraid of sowing it in your sandy soils in this latitude, it will thrive most grandly.

Question — Will it thrive on marshy land?

Answer — I have seen the finest kind of blue grass sod growing on a drained peat bog, but if it is flooded in the summer, it will kill it out. It will grow on wet land, provided it is not covered with water at any time for any great length of time; you can safely sow it on your drained wet land.

Mr. Cheever — I am willing to concede the value of blue grass. I think it is very nutritious, but I think we do not want to discard our northwestern grass, our clover, and take up blue grass. My understanding of blue grass is that the roots are fine, and they do not penetrate the soil to any great extent, that they are much like timothy grass in that particular, and it won't do to depend on blue grass any more than timothy as a fertilizer. We must have great depth below the surface to produce fertility and we are assured that in the analyses of these roots as compared with clover roots, there is only about half the fertilizing properties found in them, that are found in clover. We cannot afford in this latitude to lose sight of clover. I wish to say that I have been investigating somewhat the alfalfa grass. I understand that its roots penetrate from six to eight feet in the ground, and that in dry seasons the alfalfa will be rich and flourishing, while other grasses that have their roots nearer the surface, are drying up. I have friends and relatives in California where it does not rain for an entire season, and there the alfalfa flourishes, and is introduced more and more as a forage plant.

Professor Henry — As my friend Mr. Cheever has just dropped a word about alfalfa grass, I want to say a word. There are parties trying to sell alfalfa here in the northwest, but I say to you, farmers, do not buy over two pounds to experiment with. Because they can get five crops in California, it is no sign that we can do it. They can grow apricots in California but we can not do it in Wisconsin.

Mr. Allen — I have never raised it myself, but as far as my observation goes it is a failure, and you don't want it at all.

Mr. McGinnis —I am heartily in sympathy with what Mr. Cheever has said in regard to clover. My plea is for you to include blue grass among your grass resources, not exclusively. If we have got a dozen resources in the way of grasses let us utilize them. My observation shows me that it is a fact that blue grass will thrive here, and thrive well. By all means let us not pay exclusive attention to one grass, but let us use every string in our bow.

Mr. Allen—I did advocate yesterday, as you remember, sowing mixed grasses for pasture. There is nothing in the world that you can use that will renovate your land so thoroughly as clover, but for making a pasture the mixture of grasses is a most decided benefit.

Mr. Hoxie —I think if we had some experiments made in our agricultural experimental station to tell us just the length of duration of germination of our seeds that we grow on the farm, it would be a good thing. I am quite sure that blue grass seed over two years old, will not germinate, but it would be a great thing if we had a table from our experimental station that we could rely upon.

Mr. Austin—My opinion is, that in a permanent pasture you can not afford to ignore blue grass.

PASTURAGE AND GRASSES.

BY C. A. HUNT, SPARTA, WIS.

My first thoughts have been the want of knowledge among the farming community as to their best interests in the matter of grass for pastures and for hay. We have dropped into the habits of our fathers in using two or three varieties of grass, without any knowledge of whether the soil that we own is properly adapted to those kind of grasses or not. We have been in the habit when we have wanted a piece of pasture, to take that piece of land that we have worn out for something else, that has been entirely exhausted, and would not raise white beans, then we go and seed it with old timothy seed, red top or something else that

we ought not to expect a good return from. We turn our old mooley cows onto that pasture and expect them to come up at night with their bags full of nutritious milk, after they have worked hard all day long grubbing at that grass in that poor piece of land. This is one of the great reasons that we do not get better returns from our pastures. This is one of the points on which we are getting instructions from these gentlemen here, how to make those lands do better. There are hundreds of farmers, even here, who have dropped down to the use of only two or three kinds of grass, while there are many others that would help our land and make permanent pasture. We find among them Hungarian or millet, fox-tail or bottle grasses, timothy, red-top, wood grasses, hair grass, several varieties, meadow, oat and velvet, Reed, Melic, rattlesnake, quackin grasses, spear grasses, English ever, barley and wild rye grasses.

Now, the question has arisen in my mind how are we as farmers, to distinguish those plants which the Great God of nature has given us, that are best adapted to our use and to the soil that we wish to put it on. I believe many of us fail to make money from year to year, because we do not know how to practically demonstrate those things, so that we can put them in use, and it seems to me that this is a point where our Experimental Station or Agricultural College could come to our aid as farmers, and illustrate to us those very things, designating to us what kind of grass is best adapted to such and such varieties of soil, and doing it in such a way that we could use it. That seems to be a speculative theme among those whom I may term agriculturalists. There is a distinction between the agriculturalist and the farmer, the farmer is the man who makes his farm support him, the agriculturalist is the man who supports his farm, and there is a wide distinction, and it comes to the point that with us farmers it is all we can do to make ends meet by our industry on our soil. We have not time to make experiments, and while we pay taxes to build up these schools and institutions, why should not we be benefited by them?

That is what we want, what we need, and what we will cheerfully pay tribute for, and as we pass along with these thoughts, we hope that these gentlemen will take notes and prepare some experiments, as they are called here, with alsike and timothy and these other kinds of grasses which have been spoken of, so we can know about them, how deep the roots will go, and other such questions so that the farmers of Wisconsin may learn such things. Now, dropping further along in our thoughts on this subject, it is better to be honest even if we expose our ignorance, we believe to-day, ladies and gentlemen, that we lack a knowledge of our own business. We feel it, and as I come down with my thoughts on this subject, I find that I am like a boat, and a small one, cast upon the wide expanse of waters with broken oars and without a rudder. I am lost in the fields of nature and I know not where to moor my little boat.

Now, drop down to the question of transmigration. Do not get alarmed, I am not going into theology. I simply want to raise the great and mooted question, which will soon be raised as to the change of grasses. That question which you have all discussed at your homes and around the corner stores, of the changing of grasses, of the change of wheat into chess, and of chess into timothy, and we come here to-day and we have got scientific men before us, and they tell us that there is no such a thing as a change, whilst the good, honest, hard-toiling farmer will come up and say he knows there is a change, and the question is unsettled, and yet it is written and disputed from day to day.

Now, upon this question, I first start with this: You go to work and sow your timothy pasture, your timothy seed, seed it down with the expectation of getting good results, getting a nice pasture, or with your clover. How long will you continue with it? How long before that feed that you have sown is entirely run out, or is changed entirely to another variety of grass, with blue grass, with June grass, or white clover has taken possession of the whole of your field? Is there any arrangement of this in the God of Nature? Has he provided any arrangement by which this change takes place from day to day and is eradicating the

seed that you put down, and bringing forth another? Has He not throughout your whole field implanted the different varieties of plants? Is He not ever coloring your flowers and painting your fields with beauty, and will your Dairymen's Association pretend that you are higher authority than the Great God of Nature in the changes of Nature? Those are great questions in my mind. When you come up and say, these things are so, then we say, acknowledge the cause gentlemen, and take your place in the class.

Now, my experience has been this, for a permanent pasture. I have different varieties of land on my two hundred acre farm; I find it is part of it heavy clay, part of it black loam, and part of it marsh or peat.

I wish to say that my best success in securing a permanent pasture has been by taking off the surplus growth, the hazel brush and night-shade and burr oak, in the spring of the year when the ground was full of frost; I take a mattock and sculp it off, put on some red top seed on top, and harrow it in. I have tried that on the west side of the creek.

The east side of the creek is some land that I have broken and cultivated three years, and put into pasture, and I am safe to say that the sod that never was broke produces twice the food as the sod that was broke. I believe that is the way to make a permanent pasture, to never turn the sod under, and if you do make a pasture where the sod is turned up, try and get the same side up that was up when nature made it, and I believe you will have better success with it.

Now, passing down with this change of grass, I want to give you a little experiment that I have passed through. I am unable to account for it, and if there is wisdom enough in this Association to answer it, I want it answered. I had a piece of land, about four acres, which was upon a spur of land, covered with white oak timber, and a few scattering brush. I had that all cleared out, with the exception of the white oak stumps. It was plowed in the month of October after the frost had come, it was broken at that time. Next spring it was sowed to spring wheat and raised thirty odd

bushels of good spring wheat to the acre. The next year it produced a good crop of corn, and the third year it was seeded to oats and with pure, clean timothy seed. When the oats were cut the timothy grass made its appearance as a splendid set, it was up in nice shape, thick and nice all over the field. The oats were taken off and in about four weeks from that time there was a peculiar red appearance upon the field. I went to the field and looked over it, and I found that it had grown right up through the timothy sprout what we call crow-foot, a pronged grass, three pronged, heavily seeded, all over the field, and it gave it the appearance of a sorrel patch. I called my neighbors in to examine that grass. They looked at it, examined it, and could not account for it, they thought that I had been sold, that I had bought some different seed from timothy to seed it. Well, I says, "We will let this thing stand till spring and we will see what it comes out." Nothing was turned under. In the spring that crow-foot had dropped and laid upon the ground, covered it thick all around the sprouts of timothy. The timothy was right up, the same leaflet that bore the crow-foot, right up through the same leaflet, and that was as fine and nice a piece of timothy as ever grew on a man's land, while the crow-foot laid on the ground even till the next fall. Now, will some one account for the two varieties growing at the same time from the same seed? This was new land.

Now, following a little farther the same land, and under my own observation, that field ran for three years in pasture, when it run out into June grass and white clover, and became almost worthless for a pasture. And at the time, Mr. J. J. Smith came to our place and started a cheese factory, I thought I would recuperate that piece of pasture by sowing some plaster on it. That piece of land was sown with plaster, about seventy pounds to the acre, for that piece of blue grass and white clover in the month of April, and it sprung up immediately to red clover, and it was as nice a field of red clover as ever grew. Now, I wish to say gentlemen, that there never was a spear nor a seed of red clover

sown upon that farm up to that day. Now, where did it come from?

The Chairman — I don't believe it. Like produces like in Monroe county as elsewhere.

Mr. Hunt — I knew you wouldn't believe it, but these are facts. Neither would old Pharoah believe Moses when he came up with his rod, and thought that his magicians could do anything that Moses did, but when Moses' snake swallowed up theirs, then Pharoah said, "Kill the magicians."

PASTURES FOR THE DAIRY, HOW TO TREAT THEM.

BY C. R. BEACH, WHITEWATER, WIS.

The yearly products of the dairies of Wisconsin amount to over 2,000,000 of dollars. I think I may safely say that three-fourths of this amount comes from pasture grass.

The summer growth of stock, and beef cattle, of horses and hogs, of sheep and their wool, will amount to as much more, making a total of not less than 30,000,000 of dollars as the direct annual contribution of pasture grass to the wealth of this state. A sum larger than the value of our corn, our rye, our oats and barley, buckwheat, potatoes and tobacco combined, and twice the value of our hay crop. A large per cent. of our hay crop we use simply to bridge over from one summer to another and get no profit at all from it.

For all this yearly increase of wealth, we neither plow nor sow, we neither reap or gather into barns. It comes as the result of the lowest possible outlay of labor, I might almost say of no labor at all.

Pasture grass is in itselt an almost perfect food both for milk and meat production, which is true of no other product of the farm. It also gives larger returns for the amount of solids it contains than any artificial combination yet discovered, and all this with scarcely any perceptible diminution of the productive power of the soil. Any farm product

that has so much to recommend it deserves more attention than it has hitherto received. The time may come when we shall feed our cows all summer in stables, but land must be dearer and help cheaper before we can do so with profit.

Prof. Henry at the experimental farm at Madison as reported in the volume for '86, found that an acre of old pasture with cows below the average, would produce 2,224 pounds of milk, or 102 pounds of butter, as against 4,782 pounds of milk, or 196 pounds of butter, by soiling one acre about half and half fodder corn and clover, fed to the same kind of poorish cows. I think I can demonstrate that in this experment the pasture yielded the larger profit. The acre of pasture was credited with 102 pounds of butter at 20, $20.80; the acre that was soiled, 196 pounds of butter, $39.20. The food from this acre was equal to 244 days' rations or 24 cows, 10 4–10 days; allowing that it was worth one dollar a day for a man and horse, without board, to cut the fodder, feed the cows, and draw and spread the manure, this labor would cost $10.40. But as something over one-half of this acre was fodder corn, we will charge for plowing, harrowing, rolling, $3.00; for seed, $1.00, cultivating, $1.50, $2.50. But as two cows could be kept by soiling as against one on pasture, and allowing that the decrease in the value of the cows from spring till fall was eight dollars each, we must charge the decrease value of one of the cows against the soiled land. The account will then stand, income from the acre of pasture, $20.40. From the acre soiled, $39.20, less expense of $23.50, or $15.70; or $3.70 in favor of the acre of pasture. But farther on I shall show that this acre soiled has lost a larger per cent. of fertility than the pasture.

Prof. Brown of the Canada Experimental farm, in speaking of permanent pastures at the Farmer's Institute at Fond Du Lac said: that he kept two cows five and one-half months on one acre of land seeded for permanent pasture. They were not taken from the field during the time even for milking, and they had food from no other source. They gave during the time 7,500 pounds of milk, equal to over 300 pounds of butter. The skim milk would pay the labor, the butter at 20 cents was worth $60, allowing $16

as the decrease in value of the two cows, you have a net income of $44 from the one acre of land.

It is not to be supposed that all our pastures can be made to produce 7,500 pounds of milk per acre, or even 2,224 pounds, but these tests show the possibilities of an acre of pasture grass.

How shall we treat our pastures so that we may realize the greatest profits from them?

My limited observation has led me to entertain the opinion that as a rule, our best pastures are those that were never plowed.

We can not except in very rare instances, improve the mechanical condition of the soil for the growth of pasture grass by plowing.

Plowing compacts the soil and makes it more impervious to both air and water. To prove this you dig a ditch and then put back the dirt taken out, and it will be but a short time before it has sunk below the level of the land on each side. Another reason for the superiority of land that has not been plowed is that the native soil, near the surface contains a much larger percentage of the elements that enter into vegetable growth, than the lower strata reached by the plow, and the accumulative vegetable mold upon such lands, furnish the best possible seed bed for the growth of grass.

It also furnishes a mulch that absorbs moisture and also retains it near the roots, so that no matter how dry it may be it will not bake, and become hard.

It will on the other hand stand an excess of rain, no matter how wet it may be the thick elastic turf will prevent the cattles feet from breaking it.

But you turn under that vegetable mold six inches and how many years will it be before you have another such sod? Not in ten years, and I doubt if twenty will produce it.

My higher ideal of a pasture is one of thirty acres upon a farm adjoining the one upon which I was born. Fifty years ago it was an old pasture, the stumps had all rotted out and it had never been plowed; and it is in pasture still.

It will carry twenty-five two year old steers from early spring till late in the fall, and nowhere have I seen fatter cattle than upon that same pasture in November.

The grass started early and grew late, and was always green. The drouth never pinched it and the rains never washed it. Cattle's feet could make no impression upon it, and so could not foul it. Walking upon it was like walking upon a plush carpet. The grass was as soft and as fine as silk.

Such lands will absorb the sun's rays in the spring and be much warmer than lands that have been plowed. Now contrast such a pasture with one newly seeded with clover and timothy; you will have upon such a field in June a superabundance of coarse, swarthy growth, too watery to be good rations, and so rank and tender that one-half will be trodden down and wasted. And what is eaten will not be relished. While in the last half of July and through August, you will have little else than the dry growth of the previous month, which will not only be unpalatable but will furnish but little nourishment, and during the entire autumn you will have only straggling bunches here and there of unnutritious growth. Prof. Brown, to whom I have before referred, found that an acre of such grass yielded but 1,300 pounds as against 7,500 from permanent pasture.

In conversing with Mr. Gillette, the Illinois world renowned cattle feeder, he stated, that the most of his pastures had never been plowed, and he claimed for them much superiority over those that had been.

Forty years ago I heard A. B. Dickenson, one of New York's best farmers, give an address, the main point of which was to show the superiority of permanent pastures.

We all know how fearfully at times the rain washes our plowed fields in summer, and our cornfields most of all, but few if any, realize the amount of fertility thus carried away. I have no doubt that it will often amount to more than that taken to mature the crop.

As an illustration of the possible loss by washing, the Mississippi river and its tributaries drain 1,147,000 square miles of land. It discharges annually at its mouth soil

enough to cover 268 square miles one foot deep; equal to 23 square rods to every square mile, or nine cubic feet for every acre of land, within this vast territory, and yet only one fourth of the rain that falls upon it ever reaches the Gulf of Mexico.

It is possible and perhaps probable that no part of the soil washed from your cornfield ever finds its way into the Mississippi; but one thing is certain, it never washes back, or gets back any way: and that piece of land is poorer for that washing, which it would not have been had it been covered with permenant grass.

Again, dry winds sweeping over plowed fields carry away fine particles of the soil, but we seldom stop to think that grass lands are benefited by these fine particles thus carried in the air.

Yet Johnson in his agricultural chemistry says, that on a field purposely protected from the winds on all sides, the dust thus blown, and held by the grass, amounted to a quantity equal to one inch in thirty-six years. My pasture on the windward side of your plowed field, would be still more benefited.

Allow me to quote once more from the same author: "Another important agency must not be overlooked. In permanent grass lands, insects and especially earth worms abound. These almost nightly ascend to the surface, and throw out portions of finely divided earthy matter, on a close shaven lawn the quantity thus spread over the surface in a single night is often surprising. In the lapse of years the accumulation of the soil from this source must, upon old pasture fields, be very great."

We may laugh at the idea of the angle worm improving our pastures, but why may not the angle worm be as important an agent in the world's building by carrying soil, as the bumble bee in carrying the fertilizing pollen of clover, or the insignificant coral maker in laying the foundation of a continent.

Our scientific teachers of agriculture lay great stress upon the indespensible importance of nitrogen, not only in the food of animals, but also in the food of plants. A part of

this supply comes from the ammonia contained in rain water, which amounts to about ten pounds per acre per annum. Upon an old pasture with its thick, flexible turf, nearly all this supply is held until taken up by the grass roots, and little is lost.

Not so with our grain and corn crops. At the experimental farm at Rothamstead, taking the average of two years of excessive drainage but for which there was an analysis for every running from the drain pipes of an experimental wheat field, it was estimated that from 15 to 17 pounds of nitrogen was lost per acre per annum, upon plots that had received no nitrogenous manures for years.

With 44, 88, and 132 pounds of nitrogen per acre, applied as ammonial salts in the spring, the loss was 22, 28, and 42 pounds per acre. This loss you will perceive is in addition to that carried off by the crop, which at 20 bushels per acre would amount to about to 25 pounds more. They farther say, nearly the whole of this loss occurred during that period of the year when there was no crop on the ground, or when there was but little growth.

If that be true, we perceive the advantage of sowing clover with all our grain crops.

They also add the recognized exhausting character of corn is largely due, to the limited period of its growth, and the long period when the ground is bare. And further, that in the case of permanent grass, the soil is always covered with vegetation and so there will be the maximum amount of nitrogen used by the crop, and the minimum amount lost by drainage.

So we see that while we may secure more food per acre by grain crops and especially corn, the loss of the soil by the washing of rain, and the loss of nitrogen while the fields are bare, together with the extra plant food drawn from the soil by this extra amount of food produced, when all these are taken into account and added to the cost of labor necessary to its production, we may and I think we shall find that the pasture was the best paying crop. I am not arguing against growing corn and grain; we must have

them, but to make you prize more highly your pastures, and to give you the reason why you should not plow them thinking to make more money from the land, and what is worse, yet thinking you can improve them by doing it.

Thirty-five years ago I plowed an old pasture thinking to improve it. It has not yet attained its original fertility. And I have never plowed a pasture since. But will a permanent pasture maintain its fertility if left to itself? It probably would if only pastured with sheep, dry stock, or horses; if not pastured too early in the spring, too short in summer, and too late in the fall. Pastures may be often benefited by harrowing in the spring just as the frost is coming from the ground, and sowing with seed.

I have myself never pursued this method with pastures, but have with meadows with marked success. I have known marsh meadows thus treated in the fall, nearly double their product, and much improve the quality.

But a field pastured exclusively with cows year after year, while it may be benefited by harrowing and seeding, can not maintain its fertility unless enriched by material outside of its own growth.

You may top dress it with manure from your barnyard with great benefit, but this will be only robbing Peter to pay Paul. That part of the farm that produces the fall and winter feed, will decrease in fertility faster than the pasture, and will therefore need the manure still more. And the dairyman whose farm is fully stocked with cows will have to save his manure with more care than he has ever done or he will find that the fertility of his plowed and meadow fields is slowly decreasing.

I know that many seem to entertain the opinion that to make a farm productive, he has only to stock it with cows. Nothing can be more falacious. I have long held to the opinion, that under our present system of farming, the man who fully stocks his farm with cows and sends his milk to a factory, can not maintain the fertility of his farm, if he depends exclusively for feed upon what he grows on his own farm.

The man whose dairy of forty cows is producing 5,000

pounds of milk each, is yearly sending to the factory 26,000 pounds of solids, a large per cent. of this is nitrogen, phosphates, and potash, and this loss must be made good or the farm grows poorer. How shall we do it?

But let us come back to the pasture. That acre that produces 7,500 pounds of milk lost from that source alone forty-five pounds of nitrogen, and if the cows were in calf as many pounds of phosphates, and a large per cent. of potash. This loss must be made good or the fertility will decrease.

The English farmer would sow bone dust. Let me quote from an English writer: "The application of bone dust to permanent pastures has been practiced with great success in Cheshire. Laid on at the rate of 30 to 35 hundred weight, and a cost of £10 per acre ($50), it has increased the yearly rental value of such pastures from 10 to 15 shillings up to 30 or 40 shillings per acre. And after a lapse of twenty years, though sensibly becoming less valuable, the lands have remained still worth two and three times the rent payed before the bones were lsid on."

But we have a better and a cheaper way of making good the loss of these most important elements, nitrogen, phosphoras, potash, and that is by summer feeding our cows bran while running on the pasture.

Let us take the one acre that produced 7,500 pounds of milk; there was carried off in this milk forty-five pounds of nitrogen, and if the cows were in calf, as much and perhaps a little more phosphoras and a large per cent. of potash.

But Prof. Henry tells us that the manure, including the urine, made by feeding a ton of bran to a cow giving milk will contain thirty-five pounds of nitrogen, fifty-one and one-half pounds of phosphate, and twenty-three pounds of potash. So that if these two cows that were pastured upon this acre five and one-half months had received daily nine pounds of wheat bran each, they would have left the acre as rich in the elements of plant growth as they found it, for as they were not taken from the field at all, and so the urine would be saved, and there would have been grass left as a

mulch to protect the roots in winter, or eaten by extra cattle if preferred.

Upon a common pasture we shall get full pay for the bran in the increase quantity and quality of the milk, and the manure will be clear gain, and by summer feeding we save more of the urine which is the most valuable.

Upon a farm mostly stocked with cows if we depend for summer feed upon grass alone, we shall have an over supply in June, which will be in part wasted, and a shortage in the last half of July and in August, and the milk will shrink and we shall sustain a loss, but by using a part ration of bran we can put on more cows, eat shorter in the flush, and add an increase bran ration as the grass decreases. By so doing we can keep more stock, produce a more uniform flow of milk of a better quality, and at the same time be increasing the fertility of our pasture, and all without any increase of labor.

In conclusion, let me say in proof of the value of summer feeding, as a means of improving pastures, that the best pasture I have seen in Wisconsin was on the farm of the of the late Alexander Bell of Johnstown, Rock county. It contained about a hundred acres, and had been used the last ten years for summer feeding steers for beef in connection with grain.

I was on this pasture during the drouth of last August. There was then feeding upon it sixty steers that would weigh from thirteen to fourteen hundred pounds each. They had been there all summer. The grass was ankle deep, thick as a mat, and as green as June. It was the corn that had made that pasture. Bran would have been better for cows.

But those grown steers carried off but little nitrogen or phosphates, and the corn more than supplied the waste, and the land was growing rich. The owner of such a pasture has a fortune if he knows how to use it.

(My only apology for this long article is the importance of my subject.)

DISCUSSION.

Question — Could you make a permanent pasture with clover and timothy alone?

Mr. Beach — In any of the lands that I am acquainted with in Wisconsin, God would provide the rest of the seed. I don't think he would take the timothy and clover and work them over, but I think he has got seed in reserve that he would sow it in, white clover and June grass, and it would be all right. If you could seed orchard grass and blue grass and white clover and perhaps alsike clover, it would be well. I think Mr. Brown sowed twelve or fourteen kinds of grass.

Mr. Allen — I understand this gentleman wants to know how you are going to improve the condition of your land that has already dropped below what it should be. There is no plan that I can advise any better than to seed those lands in some way, and there is no way to so successfully get a good growth after you have sowed it as to let it lay there and mulch that land. Then it takes the ammonia from the atmosphere and there is nothing better for your land if it is very poor, than to let it get a good start, get it down and let it lay there.

Question — Do you find white clover objectionable, doesn't it bother you?

Mr. Beach — Not if I don't plough, it don't bother me. There don't anything bother me, I take it as God sends it.

Question — Too much white clover does not make a good pasture.

Mr. Beach — Well, I take it in preference to something poorer.

Question — You notice cattle won't eat white clover or red clover if they can get timothy or other grass.

Mr. Beach — It furnishes a permanent supply, however, make the loss good with something in the barn, if you are not satisfied with it.

Question — I think we have got too much white clover, it comes in and runs out everything else, it comes on the best land we have.

Mr. Beach — It shows that God intends it shall grow

there. If you don't like it, sell that land and buy some other.

Mr. Allen — My brother, you are entertaining an angel unawares.

President Morrison — That is one of the great things about this dairy business. It fills your pocket and also brings that resignation that you see in Brother Beach.

Mr. Beach — It comes from slavery to the cow, you become resigned to anything.

A Gentleman — I would like to make one remark. In the case of a permanent pasture, my experience is that the quality of the soil that you undertake to make this permanent pasture out of makes a great deal of difference. Where I was raised the pastures would last for fifty years, but our soil in Wisconsin is not like that. It is more friable, the wet weather affects it more and you have to make a change. Nature says you can not hold it twenty years, the soil is not adapted to it, and the result is, that the pastures must be ploughed and seeded again. Another thing, our brother talks about raising such an immense crop of clover by sowing a small amount of seed. Do not trust to that, be thankful if you get a little crop by sowing a good quantity of seed.

Mr. Cheever — I have a field of about ten acres on one end of my farm that is broken by a little spring brook. It is just as it was when the Indian ran over it fifty or a hundred years ago, and I have not anything on my farm that pays me so well as that. I can put more stock on it and have it come out fatter in the fall than any piece I have of the one thousand acres that I own. But that is not the condition of the greater part of the pasture lands in Wisconsin. They have been already ploughed, that soil has been turned under that nature intended to be on top. I find that we have got to plough these lands and the question is what shall we put on for seed that shall be the best. I say a variety of grasses.

Mr. Smith — My experience is that you cannot get so many grasses in successfully. I put in timothy and clover to start with, and then put in the other grasses afterwards. If

you are going to keep permanent pastures you have also got to keep your permanent ploughed fields, and how are you going to keep them up?

Mr. Beach — I ain't going to plough at all on my land.

Mr. A. A. Arnold called to the chair.

DAIRYING AS A REGENERATOR.

MRS. H. E. FOSTER, SPARTA, WIS.

Mr. President, Ladies and Gentlemen:—What will dairying regenerate? Everything from the farmer and his family down to the chickens. It will regenerate the wornout soil and make it laugh with a bountiful harvest. It will give farmers better farms, finer stock and more commodious houses and barns. It will give them broader guaged ideas of life and a desire for knowledge. They will have better schoolhouses, better methods of teaching and their children will be better educated. And this is not all. It will also regenerate the towns and cities. Every branch of business will spring to renewed life and vigor. If the farmers are prosperous, every one shares in their prosperity. The cow is the Moses that will lead you out of the house of bondage and into the land of promise. She won't keep you on the road wandering in the wilderness for forty years either. Neither will one toss of her horns land you onto flowery beds of ease. It can not be done in a day or a year; yet with a right start you will make rapid strides towards prosperity.

But to make the start is where's the rub; that you must do yourselves. "The Lord helps those that help themselves," and you can't expect a cow to be more generous.

You may sit grumbling at fate and wondering why crops grow less in quantity and price till the crack of doom, and you will only sink deeper into the slough of despond.

Farmers seem to be taking a Rip Van Winkle sleep, and

do not realize that the swift wheel of time never turns backwards, but rolls right on without one pause towards the great unknown.

Do you not know that the shrill cry of the war eagle is heard no more in the land, and that the dove of peace is perched upon our banner, lo, these many years. You can't expect war prices for farm products; neither can you get as large yields of grain from soil that has been tilled for thirty years, as when in its virgin fertility.

The Creator gave to man a soil capable of abundant production, but somehow he failed to give him common sense enough to properly use it. You make a grand mistake in supposing that the fertility of the soil is like the woman's chest of meal, that a constant dipping out will not lessen the supply. This is not an age of miracles, but it is an age of progression, and the sooner you realize the fact and trim your sails to catch the progressive breeze, the better you will be off. In the words of an exhorter I will say, "now is the accepted time," do not wait; procrastination is the worst kind of a thief, it steals that which is more precious than money — time.

You shake your heads in doubt and say, it is a poor time to commence dairying, as cows sell for almost nothing and young stock you can hardly give away, and butter does not bring enough to pay for making. What do you sell that brings a better profit? Every tide has it's ebb and flow. The best time to buy anything is when it is at low tide, you will reap the benefits of the rise. Every dairyman of experience knows that many cows that are bought prove worthless and must be resold. If bought at a low price the loss will not be so great.

If you have good cows, keep them and buy more. If you have poor ones, sell them and buy better ones, even if it takes three to buy one, for one good cow will pay a profit, while three poor ones are an increasing loss.

First test your cows and all that do not come up to the standard of excellence, send to the shambles and end their more than worthless existence. Don't impose on a brother farmer by selling him a poor cow. "You can't tell by the

looks of a frog how far it can jump." No more can most men tell by the looks of a cow how much milk she will give; neither can you tell by the number of pounds of milk how much butter it will yield. If you weigh the milk and set it in the usual way, then churn the cream and weigh the butter, you will know just what the cow is good for. Decide which you will make a speciality of, whether it be butter, cheese, milk or beef, then adhere perseveringly to that line. Breed up to the highest point possible, and you will soon see what a regenerator dairying is.

Agriculture is the foundation upon which has rested the world's greatness and prosperity, since the first man and woman were placed in the Garden of Eden. To man was given a solid foundation upon which to build as his needs demanded and his ingenuity devised. The world is like a great tree. The body is agriculture; while the limbs and branches represent the other occupations and professions; all alike receiving sustenance from the sturdy body. Keep the body thriving and the branches will never want for nourishment.

What would our country do were it not for the farmers? Go where you will, from the great lakes to the gulf from where the morning sun kisses the white capped waves of the broad Atlantic to the "golden gate" on the shore of the Pacfic, where you can watch the crimson and gold of the setting sun turn to silver and blue as it is rocked to sleep in the "cradle of the deep," you will find them the fountain-head of its prosperity. You will not only find them on the hillsides and in the valleys, with sunbrowned faces and hardened palms tilling the soil, but you will find them well represented in the cities and towns. Very many of our ablest statesmen, wisest judges, worthy divines, learned professors, prosperous and influential business men and skillful surgeons and doctors are proud to say that they are of nature's nobility, and were farmers' boys, living pictures of "Whittier's Bare Foot Boy."

"There is nothing new under the sun." Rome's greatest glory was when her agricultural pursuits were the most flourishing; her greatest generals and statesmen sprang

from the farm. Her wisest and best ruler was a farmer called from his plow to retrive her waning prosperity. The city fathers and business men of Sparta are no less wise than were the Romans. They too, are calling the farmers to build up their failing homes. They are architects enough to know that to build substantially they must first build a solid foundation. For that reason they are looking for some regenerating power to put new life into agriculture. They know there is nothing equal to a meeting of a Dairymen's Association to create a boom. So they generously invite them here to waken you up. They are casting their crumbs of bread upon the water, with faith that they will return to them moulded into a goodly sized loaf. And farmers you are the moulders. But bear in mind, that while moulding their loaf, you are also moulding a much larger one for yourselves, and what you must know, is the way you can most successfully do it.

The veteran dairymen of Wisconsin have been heroically laboring for years to awaken the farmers and help them out of the old ruts. They have succeeded grandly in the eastern part of the state, and now they are calling on you to open your doors and let the light, which they so freely give, shine in. You will learn more of dairy farming in these three days than you ever dreamed of. It is not theory or "book farming" either, but the real practical experience of the best dairymen in the land. You will see what dairying has done for them. It will do the same for you, if you will follow their instructions.

Don't think it will give you a life of leisure, for it will not. But it will give you employment for both brain and muscle for every day in the year; not only for yourself, but for your family, and the larger your family the sooner you will reach prosperity. There will be no need of the boys and girls leaving the farm to earn a living. You can make the old farm blossom as the rose; you can have more of the comforts and luxuries of life; home can be made more attractive; your children can be better clothed and educated; they will have no desire to leave the home nest. You can make home life so attractive and happy, that your children will arise up and

call you blessed; and in after years memory's bells will ring sweet chimes of the old farm life. Your declining years will be made happy by the thoughts of the goodly heritage you are leaving to your posterity.

Or will you drag along in the old ruts, while everything goes from bad to worse, and you see your children going from you in search of a better life; till, when your feet have grown too weary, farther on to press their way, you are left alone by your desolate hearthstone to mourn over a wasted life. How the old father with his grey hair and trembling limbs, wishes for the strong arm of one of his sons to lean upon. While the face of the patient mother droops low, as she thinks of the early, happy days of her farm life; when her children made the house merry with their happy laugh and song, and the tears course down her wrinkled cheeks as she wonders where they are now, what they are doing, and if they often think of the old folks at home, whose sands of life are running low and whose hearts' strings are quivering with anguish at the thought that the old homestead, for which they have toiled and suffered and which is endeared to them by a thousand tender memories, must soon pass into alien hands, and there will be nothing left to show for their life's work.

"Oh, spare the old homestead." Regenerate its wornout soil. Make your occupation respected, noble and grand, that your setting sun, as well as your children's may go down in a beautiful sea of crimson glory.

THOUGHTS FROM A FARM AND DAIRY.

BY MRS. W. E. BUSH, SPARTA, WIS.

With a deep sense of my inability to meet the wants of this convention, I venture to present a few thoughts about dairying and life on the farm that I have jotted down as they floated up to me, many of them from the surface of the cream, or have found nestling among the granules of a mass of butter — homely work thoughts interwoven with

pleasant fancies, for I believe that a task has failed to realize to us its best reward unless some portion of it has given up to a new idea or helped us in tracing an old one.

For this reason I feel sure that this meeting to interchange ideas, and consult those who have made a practical and successful application of the principles of good dairying, can not fail to awaken an interest that shall be far reaching in its effects, perhaps sufficient to redeem the waste places of our country to fertility and pleasant habitations. It ought at least to make the farms we already have more profitable, our homes happier and our lives better.

Dairying is a grand old industry, for the cow has been valued for ages on account of that fluid so nutritious and agreeable which it gives us. Milk, when examined under a microscope, appears as a clear fluid containg fat globules in suspension. These measure only from .0012 to .0018 of a line in diameter, but the aggregation and agitation of these minute globules gives us a product which is by no means an unimportant factor in commerce.

Among ancient people the Hebrews seem to have made great use of milk and butter as food, while the later Greeks and Romans did not use it in that way at all. It is said to be used very sparingly in southern Europe at the present time, being sold by apothecaries as a medicinal remedy—perhaps that warmer climate does not require much fatty food. In our own latitude, however, milk is a perfect ailment, furnishing every element necessary for growth, and many believe its more general use, would result in much good to both healthy persons and invalids. Cream and butter are certainly agreeable remedies. The one, so it is claimed, for consumption, and both for nervous afflictions.

Butter is the finest product of the farm, and its proper making brings into play so many of the best faculties of the mind, that it is said dairying districts are invariably centres of intelligence and refinement, a very pleasant fact for us to contemplate.

Although we live in this ninth decade of the nineteenth century, we still feel that we are only beginning to understand the proper handling of milk and to see the possibili-

ties it holds for us, but we are giving the subject our best thought, carefully weighing experience and experiment.

The saying that one is a fool who has never made an experiment contains much truth; but perhaps some of us could confess to some foolish experiments, yet how can we arrive at truth except by repeated tests? Our failures often counting more than our successes.

I spare you a detailed recital of my own experience. Sufficient to say, it has been full of interest, with a sprinkling of pathos and humor. Interest in investigation, tears and smiles for alternate failure and success, but withal I have proved a few truths to my own satisfaction, at least.

That deep setting is preferable; that cleanliness is a necessity both in drawing and setting milk, especially in the first as no after process can purify milk that has become unclean, that it must be cooled as rapidly as possible to a low temperature, skimmed while sweet, cream frequently stirred and kept not over three days in winter and a less time in summer at a temperature warm enough to produce slight acidity, cooled to 58° or 60° before churning, thoroughly washed with pure brine and salted with the finest salt while still in the granular form, packed immediately and sold ditto.

This seems a simple formula and with all proper appliances it is not very difficult to follow; the most difficult part is to control the temperature and to give the work the same regular attention that any other business would demand; success in any avocation means close confinement to business. A building apart for the purpose is most desirable, but not many (without factory accommodations) on a small farm with a few cows can have all the nice conditions they could wish, but all are in duty bound to make the very best of their circumstances.

A clean room, well ventilated to permit the escape of odors. Milk closely covered, a thermometer to gauge the temperature of milk and cream. This costs but a trifle, you will almost be angry with it for not costing more, you certainly will be with yourself for having done without it when you learn its value together with a high idea of what your

product ought to be, and a fixed determination to do the best you can, will secure success for you, under even unfavorable circumstances.

Butter makers are generally somewhat opinionated; apt to think they already have all necessary knowledge; but it is possible the best of us can be excelled, and until we admit that fact, and place ourselves on the footing of learners, or be able to give a sufficient reason for our assurance, we shall miss many helpful suggestions. It is sometimes better to be too credulous than never willing to learn.

I believe much good butter was made, and is still in the old fashioned way, but it requires exceptional care.

I have never eaten better butter than my mother made, but I could not make a uniform quality in that way, so easily as by later methods, perhaps my mother did not, a youthful appetite adds flavor not otherwise imparted.

I think a small dairy furnishes not unpleasant occupation for women, and solves the problem of remunerative employment for them at home, an argument much in its favor, for a certain income adds zest to ambition by furnishing means to carry out individual tastes, and enterprises that tend to make the home more beautiful and desirable; but there is with all some of the hard and homely work, which, perhaps, we are all quite willing to delegate to other hands, and where there are not grown daughters it is much better to divide the labor with employes, if we exercise a wise supervision, taking pains to teach them method, neatness, punctuality, and the same habit of observation that makes our own labor a pleasure, so may we not only contribute to the world an article useful and beautiful, but may also give to the individual a sense of usefulness and therefore happiness.

And let us not underrate the work of the kitchen, the farm and the dairy. The work which makes all other work possible; for behind every master, in any art or avocation, stands the humble worker who feeds the machine, "useless one without the other." We value art and are enraptured by oratory, but we can dispense with them, as an every day

diet without the sense of loss we experience when dinner is not.

But we credit the artist and orator, and pretend to despise the hand which proffers the elements which sustains them. God does not so account, the lowest work may be the most beautiful in his sight, if done well.

And this is a work-a-day world; not many of us are exempt from toil, either physical or mental; we have our seasons of relaxation and social communion, then back to work again with renewed zest and increased vigor. But let us as farmers' wives and daughters be thankful for the toil that brings us the bountiful fare, the pure atmosphere and the sweet sleep of the country, and that we are not numbered among the toiling millions of over-crowded cities. There are veritable millions in our humane age working at starvation wages. Reliable statistics from London report the fact that many sewing women receive but 9d for a day's work of sixteen hours, hundreds of women work for ¾d per day and find their own needles and cotton. Can we realize what the loss of a needle or the waste of a few inches of thread would mean to them?

Nor need we leave our own fair land to hear similar tales of suffering. In Cleveland, Ohio, women are found working hard, make button-holes at three cents per dozen, or making heavy overcoats with padded and quilted linings at thirty-five cents apiece, while out of this pittance the sewing machine must be paid for in installments, and is liable to be forfeited at any time together with all that has been paid, if the weary worker fails to promptly meet a single payment.

Work! Work! Work! Has a woeful meaning to those poor creatures, "For what are its wages? A bed of straw, a crust of bred, and rags, a shattered roof, and a naked floor, a table, a broken chair, and a wall so blank their shadows they thank for sometimes falling there." Many of them remembering happy country homes, could say:

"Oh, but to breathe the breath of the cowslip and primrose sweet,
With the sky above my head and the grass beneath my feet,
For only one short hour to feel as I used to feel
Before I knew the woes of want, the walk that costs a meal."

To share with them our privileges and our work would seem a blessed interchange for both, but the accomplishment of this end is one of the vexed questions of the day; in the interval we study the social problems nearer home.

It has been said in a paper at one of our farmer's institutes, that our hired girls envy our school-keeping daughters. 'Tis true. That spirit of envy works half the mischief in the world. But is there just cause for envy? It is skilled labor that commands high wages. It is previous preparation that fits one to enter the so-called higher callings.

Two girls may have equal advantages of schooling; one may realize the value of time and the duty of application or be ambitious for position, while the other allows the priceless days of youth to drift by unheeded, careless of ought but ease and amusement. The time comes when each must take her place among the world's workers; while the one can enter the schoolroom, the only recourse of the other is domestic service, nor has she any right to rail at the fate that makes her a hired girl and the other a teacher.

Our young people must learn that application is more than opportunity; many of our teachers and educated women had no better chance of preparation than our district schools afford until they could by teaching earn the means to attend school elsewhere. All honor to the brave girls who have thus scaled the hill difficulty, and equal honor to those who have made a success of the work of the home. Let us remember the nobility of faithful service. Jesus says, " He who is greatest among you, let him be your servant," and he dignified every menial service for us in that he washed his disciple's feet.

Are we not all waiting to hear the " Well done," and does not a sense of responsibility to a higher authority than earth make us all more amenable to the law and order that control us here? And it is a blessed thought that the best things of life are not monopolized by those who stand in high places. Truth, purity, honor, and the grace of God are as accessible to the humblest as to the highest station, and

"Tales not unkind, whatever man may say,
If Goodness walks companion of her way."

Have not many of us seen beautiful illustrations of this in humble homes, perhaps by an old-fashioned mother, full of cares and sacrifices for her children. Those old-fashioned mothers! Do their children need other heritage than the memory of their noble lives? How pure was the spring of all their actions? How unsullied their lips? "Their hands ever reaching out, with trifles scarcely thought about."

This structure of character is a work of infinite pains, but it is possible to bring it as near perfection on the farm as human nature may come, as the annals of the world testify.

To read the lives of great and notable men one would almost conclude, that to be born on a farm was the first reqiusite to success. But ought we not to keep on the farm a goodly portion of the honesty of purpose and strength of brain and muscle which it has generated, that we may elevate agriculture to its true dignity? Still we can not constrain our sons, each must choose for himself, a sense of duty has kept many a young man on the farm against his inclinations, but has not duty chosen for him better than inclination, and often its rugged path proven coincident with the pleasant pathway of success?

There is space for usefulness and influence in the country, especially in the present, to advance the cause of good dairying in our state, which furnishes abundant exercise for the best there is in a man. The harmonious action of mind and muscle which it calls for, gives health to both and to the soul as well.

Let us make farm life more attractive by bringing into our homes the spirit of enterprise, and with it the disposition to live for comfort rather than appearance or the hoarding of wealth.

As farmers we have great reason to rejoice that our homes are in Wisconsin where anarchy can not live, and where all noble reforms and charities prosper. We have only to look at the beautiful buildings reared in our midst by the beneficent

hand of our state, to be reminded of this. I have watched them take form and beauty with an ever increasing enthusiasm, their beautiful proportions seem reaching to heaven. Can we doubt that the heavenly ones are watching with loving solicitude over the innocence here gathered and protected, and that their benign influence falls upon the hearts of those who witness such noble charity? A stigma ever attaches to the town which gives place to a penitentiary, but the ancient and honorable name of Sparta can not fail to receive added lustre from her Home for Dependent Children.

Gathered here to-day as a company of farmers to enjoy this convention we should return our grateful acknowledgment for the efforts made for us by our noble state, through the influence of our leading representatives. And as dairymen and dairy-women let us receive the knowledge offered by experience in this convention and profit by it, and let us idealize farm life by mutual helpfulness and that sweet spirit of charity that "thinketh no evil," and if need be "suffers long and is kind," that life may mean a great deal to us as filled with good though humble deeds, it speeds to the fruition of every hope in heaven.

Let us live for those who love us; for those who know us true,
For the heaven that smiles above us, and awaits our spirits to.
For the cause that lacks assistance,
For the wrong that needs resistance,
For the future in the distance,
And the good that we can do.

The convention adjourned to meet at 1:30 P. M., the same day.

AFTERNOON SESSION.

Convention met pursuant to adjournment at 1:30 P. M., President Morrison in the chair.

MY EXPERIENCE AND SUCCESS IN DAIRYING.

BY MRS. A. M. BRAGG, VIOLA, WIS.

In the little *Farm Journal* it says, take pen and paper and sit down by the winter fireside and do part of your summer's work, or in other words, get ready. So in April I got me a large book, and wrote on it, "Dairy Book." Then at the top of each page I wrote, first, butter churned in 1886; second, butter sold and money received; third, butter shipped to Merrill and Eldridge, number of pounds, cost, sold for, net proceeds, date of shipment, and other firms the same way; fourth, named each cow and put her name and age at the top of a page by itself.

Do you ask why I did all this? I wanted to know by test and not by guess, what each individual cow was worth, and how much she would bring me in a year.

As I had no oil-test churn, or any other appliance for testing, as each cow came in I set her milk for one day by itself and churned it by itself. Then I wrote under her name thus: Rose, calf named Prince, April 9, 1886. Tested her milk May 9th, calf thirty days old. Milk, 28¼ pounds; cream, 2 pounds; butter, 1¼ pounds. Making 1 pound of butter from 22¾ pounds of milk.

Next, Leo three years old, calf named Stray, April 18, 1886. Tested her milk May 18th, calf thirty days old. Milk, 20 pounds; cream, 2 pounds; butter, 1 5-16 pounds. Making 1 pound of butter from 15 5-21 pounds of milk.

Then, Dolly, four years old, calf named Frisk, April 29, 1886. Tested her milk May 29th, calf thirty days old. Milk, 27 pounds; cream, 2 6-16 pounds; butter, 1 9-16 pounds. Making 1 pound of butter from 16 32-25 pounds of milk.

I did the same with the other nine, they averaged about the same. These tests were made on grass feed, made no change, only saved the milk the thirtieth day.

Then I wrote under this, weight of milk one day each week, so that I could get an average of what she would do per day for the season.

Then, knowing that the milk was richer in the fall than in the spring, I re-tested them, and found that Rose tested thus: October 16th, milk, 16 pounds; cream, 3 pounds; butter, 1 1-16 pounds. Taking 15 1-17 pounds of milk to make a pound of butter. It took 22¾ pounds in the spring.

Leo, December 20th, milk, 13 9-16 pounds; cream, 2½ pounds; butter, 1 5-16 pounds; 10⅓ pounds of milk to make 1 pound of butter. She made the same amount of butter from 13 9-16 pounds of milk that she did from 20 in the spring.

Dolly, December 27th, milk, 10 pounds; cream, 2½ pounds; butter, 1 1-16 pounds. Taking 9 9-17 pounds of milk for 1 pound of butter.

In the last test they had hay and four pounds of feed a day, corn meal, bran and squash, all togather making the four pounds.

After getting the average weight of milk to make a pound of butter, I added up their weights for the season, and found out what each individual cow was worth.

Rose, 4,228 pounds of milk in 8½ months; it took 18 pounds of milk to make 1 pound of butter; she would make 235 pounds of butter in 8½ months; 235 pounds at the low figure of 15 cents, she would earn $34.25; calf, $2; skim milk, at 20 cents a hundred, would be $8.45; butter, calf and milk, $44.70.

Leo, 2,688 pounds of milk in 8 months; if it took 13 pounds of milk to make 1 pound of butter, she would make 206 10-13 pounds of butter in 8 months; 206 pounds at 15 cents, she would earn $30.90; calf, $2; milk $5.37; total, $38.27.

Dolly, 3,220 pounds of milk in 7½ months; if it took 12 pounds for 1 pound of butter, she would make 268⅓ pounds of butter in 7½ months; 268 pounds at 15 cents, she would earn $40.20; skim milk, $6.44; calf $2; total, $48.64.

Now, supposing I had got what C. P. Goodrich gets, 30 cents a pound—butter, $80.40, calf, $2, skim milk, $6.44, she would earn the neat sum of $88.84. So you see it makes quite a difference whether you make 15 cent or 30 cent butter, to show up the value of you cow.

Please remember that this milk and butter were given un-

der the most trying circumstances, nothing but dried up grass, and water, for over three months of the time.

We set the milk in cans up to November, let it set twelve hours, then fed the milk to the calves, two calves to one cow. Then as butter came up in October, I set the milk in pans, and in that way I got 6¼ pounds of butter to the 100 weight of milk.

Hon. Hiram Smith says if he gets 5 pounds of butter to the 100 pounds of milk, he is satisfied with the result. Five pounds at 30 cents (I believe he gets that), would bring him $1.50 a 100. I got 6¼ pounds to the hundred, and sold it for 24 and 25 cents a pound. At 24 cents, I got $1.50 a 100. He gets more money a pound, I get more butter a 100, and both get $1.50 for a 100 weight of milk.

Since writing this, my butter has sold for 27 and 28 cents, I am 2 cents behind in price yet. So I know and don't guess that our herd of cows give good milk, good cream, and in sufficient quantity to make them a money-making investment. They are grade Jerseys.

Let me say here, that I believe that no work on the farm will pay so well, as work spent in weeding out our unprofitable cows, and the best way to fill their places is with heifers raised from the best cows in the herd.

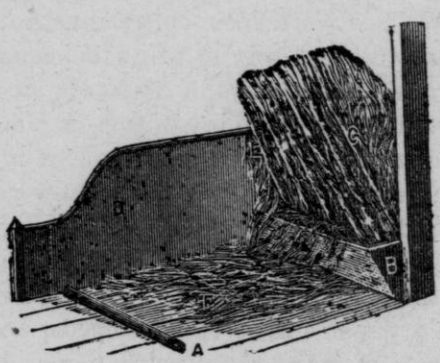
I will not tell how I make my butter, as Mrs. E. S. Robertson has a paper on that, and I took some of my best lessons in butter-making from her, I will only show you a fork that I made to handle my butter with.

Prove all things; hold fast that which is good.

First, we must take a paper if in the dairy business, a dairy paper, a paper suited to our needs. After reading the paper we don't want to throw the paper down and say, that does well enough in a paper, but won't do in real life. How do you know it won't, if we don't try it? I believe in proving all things. If I have not got just the thing the paper calls for, I use something as near as I can in its place. If you see a cut of a new calf pen, or cow stable, and you don't feel as if you could spare the lumber and time to make one, till you see one in use and know that you will like it, make a model out of pasteboard.

In the December number of the *Farm Journal*, we find a cut of a new cow stable, an invention of C. S. Ruddock, Berlin, Wis., no doubt many of you have seen it. Mr. Gill saw it and made one like it, we saw his and made one, and here is a pasteboard model of it. I think it the best thing in the shape of a cow stable I have yet seen, and it came out of a newspaper. In saying and showing this, I have no axe to grind, or am I turning the grindstone for any one else.

The floor should slope towards the rear one inch in 6 feet, and be divided into stalls about 3 feet wide, or wider for larger cows. (See D.) A rack should be put at the head of the stall sloping backwards, at an angle of 45 degrees, (see C,) and at the bottom on the outside there should be a meal box half way across or clear across, (see B.) In the corner there should be a ring (see E,) in which the halter may be tied. When the cow stands in this stall in a natural position her hind feet will be in the rear of the round stick, (see A,) and her droppings will all fall behind the stick (see A,) which



is held in place by staples. When she wants to lie down she will lower her head and step in front of the stick (A,) and always have a clean bed. (See F.) Mr. Ruddock says his cow has stood in such a stall all winter and never been soiled with the manure. The stick which should be about four inches in diameter, (A,) must be placed just far enough back so that the cow will stand with her hind feet behind it.

Here is the stable and printed directions for making it. Mr. Bragg says to make the box 1½ feet wide and 12 inches high, so it will catch the fine hay, and it will not hinder the cow in lying down.

And here is an adjustable calf rack, that Mr. Bragg made to feed his calves in so they can not waste the hay. It is one foot from the floor, 2½ feet wide, 5 feet high and 3½ feet at the top. The openings in front are 16 inches wide, the boards one foot wide, the adjustable rack is 5½ feet high, and the slats are 5 inches apart, slats 5 or 6 inches wide, hoop poles can be used in place of the boards. This rack is nice for sheep or calves; grain can be put in this box and there will be no wastage of feed.

Do you say you have not time to make models? Set the girls and boys at it then. Let Mary make a model, then if it suits you, set John and Harry to build one; Jack to proving the hot and cold water drink, Sam, to trying the curring test. Let the girls weigh the milk, and see who comes out ahead, make things lively for the girls and boys. In that way you will keep them interested in the farm, also keep them on the farm.

There is more culture and profit in thoughtful work than in rut work. If we don't think it worth the while to step out of the old rut of just work, work, work, we need not be surprised, if when old and we need the boys and girls, we find that they have gone to some pleasanter home. Let us remember we reap as we sow, with this difference, we sow a handful, we reap a bushel.

CARE OF CALVES.

For a week we let them take their mother's milk, then Mr. Bragg made a feeder that gives the calves their feed as near like nature intended them to have it as possible. If allowed to drink, they take it too fast for their good. It is made in this way. (Shows it.)

We take new milk to learn them, it very seldom takes more than two lessons. When they drink nicely, we put in half skim milk, till ten days old, then skim all the time; use the feeder till they wean themselves. I place a large iron ket-

tle on the stove and fill it half full of water, put skim milk in can and set it in water to warm, have clean pail, (I wash them out every day with a little brush broom, and wash day they go into a tub and get a good scrubbing, and dry in the sun), a little care in this respect will make the difference between a poor sickly calf, and a large, healthy and thrifty one. Then carry the milk out to the calf, that has first been fastened in some stanchions. If I see any signs of sickness or over-feed, the next feed I give only half of a mess and put one egg in it. I treat calves like babies, cows, like mothers. This winter we keep them in a stable, with a rack that I have shown you, to feed them in.

Experience has taught me that I must make my butter to suit my customers. Supposing W. D. Hoard had started out to edit a paper and made a paper just as he liked it, with no regard to the likes of his customers; wrote about things his mother talked about, printed his paper by hand because his father did, folded it by hand, never colored up his writings to make them attractive, then spent the remainder of his time grumbling because people didn't want his paper; and insisting that it was because they did't like him, for surely his paper was just as good as any paper in the land. If he had done that, I think his purse would be as thin as he is in flesh. But did he do that way? No; he was wise enough to know that his butter would not come that way. He selected the farmer as needing help, so he got up the *Dairyman*, then studied up the individual needs of each; tells one how to raise better corn, another how to get a better breed of cows, another how to make gilt-edge butter, tells how to make, how to ship, who to ship to, when a new thing comes along posts you in that, keeps up with the times. By acting wisely, his intelligent paper is the farmer's true friend, the editor, a public benefactor.

And we farmers must step out of the old rut that our mothers trod in, and lay aside the old dasher churn, cease to work the butter with our hands because mother did. Let white butter be a thing of the past. Forget there is such a thing as barrel salt, or little ten-cent sacks. But instead, let's make butter that the market asks for, and will

command an extra price when offered for sale. When there is a change in the market, change again. Why, if Merrill & Eldridge should write me that my butter would sell better if colored green, the next tub would go out green.

Of what earthly use is a spool of thread till we unfasten the end and make use of it? and of what earthly use are brains if we keep the end fastened? The key to successful dairying, is to unwind and keep unwinding brains.

DISCUSSION.

Mr. Linse — I would like to ask Mrs. Bragg why she sets her milk in open settings this time of the year?

Mrs. Bragg — This winter I found I could get better butter from open settings, and besides that, our water gave out. I think now I could get as good butter with the deep setting. But at that time the price did not say so.

Question — Do you think it is as even grade, with the open settings?

Answer — Yes, that is, if you are of even grade in taking care of it.

Mr. Hoxie — Mr. Gould suggests that this society offer a premium for even-grade-butter-makers.

Professor Henry — I hope the audience will not fail to carry away with them the important point made in the early part of this paper as to carefully testing each cow in the herd. I heard a man down in the walk as I went away from here say, to another man, "Are you going up there this afternoon?" And the other man replied, "What in Sheol am I going up there for?" And he didn't say Sheol either. I thought to myself, "My friend, the chances are, if you go up there, you will get instruction you need." And I wish that the farmers, and especially the farmers' wives would just carry home this point, if they carry home nothing else, that there is nothing so important upon the farm as to know the individual merit of every animal. I expect there are owners of cows here, whose cows will giveforty pounds of milk a day, and yet will scarcely give a pound of butter from that milk, and yet those farmers are bragging on it. There

are other cows that will give but thirty pounds a day, and yet as Mrs. Bragg has shown, one of her grade Jerseys only needs fourteen pound of milk to make a pound of butter. There has not been a more important point brought out here. On our university farm we have cows that it takes even less of their milk to make a pound of butter; we know what they can do every one of them. We keep track of them and we know just which ones are profitable.

President Morrison — The chair desires to say one word upon this subject before we pass it. After attending one of the dairy conventions in the southern part of the state, I had a conversation with Mr. John G. Flack. He had one cow, a short horn grade in his herd, that whenever he had visitors he was always sure to point out, and he told me that he had often refused one hundred dollars for this noble looking cow, but he commenced to test his cows and then he found out that she was the poorest cow in the herd, and that a little small grade Jersey, and also a native that he thought nothing of, were the ones that were producing the most cream, and the large cow was the first one to go to the shambles.

Mr. J. J. Mann — I want to say just a word. I came here yesterday morning with the intention of learning all I could through this association, and at the same time I brought a small pail of butter with me for exhibition, made on the old way of making. Now, by the information I got yesterday from Mr. Gould on the new process of making granulated butter, I was determined to go home and try it; as I live three miles south of Norwalk, I had to leave here at eight o'clock and got home about ten this morning, and the train was due again to start a little after twelve to come back. When I got home the first thing I asked was whether there was any cream in the house. My wife says: "But very little." Well, says I, "If there is only enough to make a half a pound of butter, we want to try and make a half a pound of butter, I have very little doubt but that it will work, by the information I got from Mr. Gould." We did try, and it turned out first rate by the first time trying, and I would say if we had known before how to do it, we could

have done it just as well before. I have tried it now and it turned out well. It is just as easy as to fall off from a log.

Music — Ladies' Quartette.

Mr. Hazen called to the chair.

THE NECESSITY OF DAIRY EDUCATION.

BY W. D. HOARD, ED. "HOARD'S DAIRYMAN," FORT ATKINSON, WIS.

We hear a great deal in these latter days about education. The lawyer, the doctor, the preacher and the artizan, have worked the power of law in behalf of a hunt after specific truths that lay in the line of their life effort, and now agriculture is demanding something of the same sort. What is Education? In a wholesome sense it is to know the truth and by training become enabled to put it in practice. In an unwholesome sense it is to know error and by long training be unable to practice anything else. St. Paul said: "The truth shall make you free." It is just as true in Dairying as in Religion. Error is a wrong theory carried into practice and it makes a slave of every man that has anything to do with it, yet the willing slaves of error are the loudest in crying out against "theory." The first thing to be learned in dairying is the truth, second that ignorance of the truths of dairying is a crime against the state, the community, your wife and children and yourself. I am supposed to be talking to men and women who desire to know something about dairying. All over this state can be seen the damaging effects of ignorance of dairy truth. In the past ten years we have made some progress, but think once of the magnificent increase in individual and community wealth that would have accrued to us had the farmers of Wisconsin fifteen years ago come squarely to the front in a mass, as did hundreds of individuals, and said — "What is the truth about dairying? We have fooled away time enough in hugging the delusive phantom of error. To the dogs with our obstinacy, our conceit and our silly jealousy

of one another. We want more money, for by it we shall have better homes happier wifes and children, and gain in intelligence, for in no other way can we hope to fill the broad measure of good citizenship.

We are ashamed to not to know what constitutes a good dairy cow. We are ashamed to go along year after year trying to squeeze money out of cows that are better fitted for the block than the pail. We are ashamed to handle our grasses and our grain in a way that shows that we don't know the truth about these things as applied to dairying. In a word we are ashamed of the slavery of error and we want the freedom that comes from a "knowledge of the truth."

Thousands of men in effect did say these words fifteen years ago, and to-day they are intelligent, wealthy and prosperous. They have become good citizens, for they stopped impoverishing the soil of their state and have made it more productive than ever before. That is good citizenship. But tens of thousands of farmers referred to, put themselves in this teachable attitude; and now let us look at their record. In 1885, Wisconsin produced according to the census, 36,240,431 lbs. of butter, the average value of which was 16 cents a pound. According to the best estimates, not over 6,000,000 pounds of this butter was strictly first-class, worth say 25 cents a pound. Had the other 30,000,000 pounds been made as it ought to have been, or as well as the 6,000,000 pounds was made, it is safe to say it would have added to its value at least 4 cents a pound. This would have added to the revenue of the farmers of the state $1,200,000. Why was it not made so as to bring this additional sum into the pockets of the tax burdened farmers? Did they not need this money? Can they afford to be contemptuous of such wealth and throw it over their shoulders? I think not. The land did not require any change, neither did the cows. The raw material, the milk as it came from the cows, was good enough to make twenty cent butter. Why then was it not so made? Why was the state robbed of $1,200,000 so badly needed by our farmers? Ah! my farmer friend, that question brings you up with a round turn. You are the man that is to blame for this

wicked waste. The raw material was here; you took it and so handled it that you lost this vast sum to the state. Some people are terribly anxious about over production and say if everybody goes into dairying it will break down the market. But I am not talking about any increase of production. I want you to see how you have destroyed the value of that you already had produced. Why did you do it? Did the farmers of Wisconsin know better all the while? Then are they doubly guilty. But for their own credit as a class I prefer to think they did as they did because they did not understand how to do any better?

Now we can see how for the sake of saving value in property already earned do we need dairy education. This census of 1885, discloses to us some curious facts. It is a good thing to hold the mirror up to ourselves once in a while and see ourselves as we really should be seen.

I have taken pains to calculate in detail the returns in fifty-two counties. The valuation was placed by the enumerator of each town and is as fair very probably as can be had. I notice that in those counties in, or bordering on the lumber districts, the price rules the highest. This is due to the active home demand in the lumber camps and mills and shows very conclusively how important an adjunct to agricultural prosperity are manufacturing interests in the creation of a profitable "home demand."

The following table will show the amount produced per county, and the price received per pound.

Counties.	Pounds.	Price per pound.
Adams	22,337	18.6
Brown	500,003	14.3
Buffalo	362,779	15.3
Calumet	447,517	13.8
Chippewa	319,471	22.1
Clark	338,525	14.8
Columbia	1,056,419	15.1
Crawford	368,157	13.1
Dane	1,970,674	14.9
Dodge	1,393,460	15.1
Door	242,151	15.9
Dunn	468,774	16.6

Counties.	Pounds.	Price per pound.
Eau Claire	357,568	17.8
Fond Du Lac	1,202,345	16
Grant	2,087,751	18
Green	995,406	15.4
Green Lake	419,172	14.7
Jackson	508,921	20.6
Jefferson	1,105,679	17.5
Juneau	335,574	13.2
Kenosha	726,096	21.6
Kewaunee	317,662	10.6
La Crosse	480,039	16.4
La Fayette	1,170,717	15.4
Manitowac	599,359	11.6
Marathon	232,450	16.8
Marinette	97,383	23.5
Marquette	245,728	13
Milwaukee	761,892	20.8
Monroe	619,394	12.9
Outagamie	654,774	14.1
Pepin	170,774	14.3
Peirce	471,612	16.2
Polk	292,374	17
Portage	371,604	16.9
Racine	716,292	18.1
Richland	686,767	13.1
Rock	1,767,891	16.3
St. Croix	509,101	18.7
Sauk	1,771,576	9.4
Shawano	150,042	12.6
Sheboygan	558,022	16.1
Taylor	23,750	13.8
Trempealeau	535,201	15
Vernon	765,336	12.8
Walworth	1,432,572	19.5
Washington	562,608	14
Waukesha	1,232,307	18
Waupaca	541,063	14.4
Washburn	479,937	15.2
Winnebago	890,961	16.7
Wood	137,424	16.1

Now here are some very surprising differences. Take for example the lowest price but one on the list, that of Kewaunee, which is 10.6 per pound. Had the farmers of Kewaunee received for their butter the same price that did the farmers of Kenosha county or 21.6, it would have added to their revenue in 1885, $34,942.82, which sum we dare say, would have more than paid their entire tax. Can the farmers of Kewaunee county afford to refuse to be better educated on the dairy question? The soil of Kewaunee county,

her grasses and the water are all good enough. Remember the butter was all made, but for lack of sound dairy sense, Kewaunee county lost this great sum. I have looked over the records of the towns in Jefferson county where I reside, and the figures tell a surprising story of the money value there is in a little dairy education.

I want you to look over this list and see whether it pays to read, study and think on this question.

Town.	Pounds of Butter in 1885.	Price Received.
Aztalon	69,350	15.6
Cold Spring	6,300	20
Concord	77,473	14.6
Farmington	102,500	15.6
Fort Atkinson City	30,000	20
Hebron	47,360	20.3
Ixonia	57,010	15.3
Jefferson	132,658	16.3
Koshkonong	124,081	21.8
Lake Mills (Town)	76,203	20
Lake Mills (Village)	14,500 Creamery	29.5
Milford	32,600	15.6
Oakland	105,791	21.3
Palmyra	11,504	23
Sullivan	64,840	16.4
Sumner	23,362	14.4
Waterloo	28,282	10.6
Watertown	83,445	12.8

A study of the mental habits of the farmers living in these several towns will reveal the reason for this wide difference in prices. Wherein a low price for butter prevails there the farmers taken as a class read but little and think but little on dairying. For instance the town of Watertown is almost solidly German in population, the farmers do not read English papers and their German papers furnish them scarcely anything in this line. They are good citizens, but they do not read and study on this question. They sold their butter for 12 8-10 cents a pound. The farmers of Koshkonong, Lake Mills, Oakland, Cold Spring, Hebron, and Palmyra, are willing patrons of dairy reading; they attend dairy conventions; they read, think and talk about the dairy, and as a consequence they have acquired a certain amount of dairy education. They sell

their butter for twenty cents and upwards a pound. Does it pay to read up, think up and post up on the question? I will show you had the farmers of Watertown sold their butter for nine cents more a pound, and that is the difference between them and the farmers of Koshkonong, it would have amounted to $7,510.05, or a portion over $3.71, to every man women and child in the town. The land, the grass and the water are just as good in Watertown as in Koshkonong. We can see by these figures what a fearful tax we pay by refusing to be intelligent on these questions. Does that pay? We need dairy education in order to know a cow and how to select her; how to breed her. Here we are losing thousands of dollars every year because we will not post up on the principles of dairy breeding. We need dairy education to teach us how to use and care for a cow, how to feed her to the best advantage, and how to produce that feed the most ecomonically. We need it to know how to care for the milk, cream and butter, and so prevent us from losing nine cents a pound as did the farmers of Watertown. We need dairy understanding in order to know how to sell the butter. Not one farmer in a hundred in Wisconsin has learned how to sell good butter even if he makes it. We need it to know how to spend the money after we get it, not like a mere digger in the dirt but like a true farmer who wants the rest of the world to respect him, and is bound to in that respect. We need to know how to get this education. We have no business to spend years of valuable time in idle wondering if it will pay to know more. By and by the Almighty will tell us to take our listless hands out of our pockets and get out of the field and we will go home ashamed. How shall we get this education? Frst, by taking our own sluggish indiffirence by the throat and putting it behind us; we must have a hunger for knowledge or we certainly never will get it. Second, don't think that everything paid out for knowledge is bigger than a cart wheel. How do lawyers get knowledge of law? By reading and putting their knowledge to practice. How do bankers gain a knowledge of finance, physicions of medicine, engineers of engineering, except by training their minds to be bright and

intelligent. All such men are readers. There are thousands of such men in Wisconsin, and they eagerly pick up every scrap of other men's experience in their line they can get. Is dairying an exception to this rule? No! Can farmers who never spent a cent to be intelligent expect to compete with those who do? No! I know of whole townships of farmers where there has not been one hundred dollars spent for dairy knowledge in ten years, and yet these some farmers wonder that other men make money out of dairy farming. How many dairy papers do you suppose are taken by the farmers of Watertown? Not many. How many farmers of that town ever spent five dollars to attend a dairy convention where they could hear dairy truth expounded? Not many! How many of those farmers ever hitched up their teams and spent two days in visiting the farms of noted dairymen in their own county in order to see with their own eyes what sort of cows, what sort of barns, what sort of management, these well posted men used to make their money with? Not many! Is it any wonder then they sell their butter for the low price they get? I do not speak of the farmers of Waterton as being any worse in this respect than those of any other towns. I have simply dug up the frozen facts as they are told by the census. I did not make the census. I believe the time has come when we should deal with facts as if they were facts, and I further believe that he is the truest and best friend to the farmer who stands up squarely, and with honest words strives to speak the truth, the whole truth and nothing but the truth.

DISCUSSION.

Mr. Linse—I think part of these comparisons are a little unjust, owing to the fact that location has a good deal to do with the prices of butter. I have heard some of the best butter makers say that they are only getting twelve and fourteen cents a pound for butter. I am in a favorable location. and get twenty-five cents a pound, because I sell all my butter to private families in La Crosse, while not far from me

there are creameries that only pay the farmers from twelve to fourteen cents. Mr. Hoard went pretty heavy on my brother Dutchman down in Watertown. But, perhaps the reason they don't get more for their butter is because they have to sell to the grocery and get whatever they can. I think some of those Germans read a good deal in German on these questions.

Mr. Hoard — I hardly think that my friend's criticism will apply in this case. The difficulty with that butter was that it was not worth any more than they got for it.

Mr. Coburn — If every pound of butter in the United States was made just as good as the best butter that is made what would be the effect on the price of the butter?

Answer — I will answer Brother Coburn's question by asking, if every individual in the United States was a female, what would be the effect on the future population?

Mr. Coburn — I submit that is not fair at all. We come here to learn of the profession. When we put a square question to Mr. Hoard, he undertakes to bulldoze us and I won't submit to that from Brother Hoard or anybody else. I want to know if all the butter was as good as the best butter, what would become of the thirty and thirty-five cent man?

Answer — The question has no relevancy, whatever.

Mr. Coburn — Don't dodge it, sir.

Mr. Hoard — I am not dodging it. It has no relevancy, whatever, to our situation in Wisconsin. If all the butter in Wisconsin was made as it ought to be made, let the rest of the world play fool with their butter, Wisconsin is the State I am after; I want that Wisconsin should learn to make good butter, and not make poor butter in order to be in the fashion. Of course I can't tell what the effect would be. I can tell what the effect is to-day upon this butter, for here are the figures to show the effect; we are making poor butter and getting low prices for it. I think the effect would be this, to quadruple, yea, sextuple the consumption of butter. If every pound of butter in the United States to-day, was as good as that which brings thirty-five cents, there are not cows enough in the United States to fill the demand, nor any two countries like it. It is our study and

our business to make an exception of ourselves to the world; that is the way to make our money, and not to continue to tread in the old track of poor butter. We have got such a tremendous competition in that line that no living man can stand up under it, but when we come to the other side of the question, there is a great demand for good butter, and we add to our salvation and thereby increase the consumption.

Now, about the farmers of Watertown, I did not speak of them as being Germans and thereby being ignorant. That was not what I meant, I did not infer that the German was ignorant. I infer this, that of the German farmers of Watertown, a large proportion can not read English, and that they do not get in the German papers, which they do read, anywhere near the amount of discussion on this dairy question, that is found in English papers. Now they made eighty-three thousand pounds of butter in that town, and by getting nine cents below what they should have got for good butter, they wasted nine cents on every pound they made. The difficulty lay right here, that the farmer himself did not think it paid to study how to make good butter, nor how to sell their butter. The farmer of Watertown sells his butter at the Cross road's store, or in the city of Watertown, where it is dumped into one everlasting mass of confusion worse confounded. Now, that man does not think it pays to put himself into the line of market thought. I coaxed a man once to send his butter to Chicago, I said to him, "It will do you good; the first thing it will teach you, is, that you don't know how to make good butter." He sent his butter there and he got ten cents less than the butter market, but he had sand in his craw, and he wrote to the commission man an indignant letter, and the commission man wrote back saying: "You don't know what good butter is." He talked sharply to him and said, "If you don't want to learn what good butter is, you can never get the price." Finally he concluded to step down out of his conceit and pride, and he studied up the matter, and learned his lesson, and as a result, in less

than one year, he was getting the highest market price for his butter.

President Morrison took the chair.

OUR EXPERIENCE IN THE CARE AND FEEDING OF DAIRY COWS IN NORTHERN ILLINOIS.

BY H. B. GURLER, PRESIDENT NATIONAL BUTTER, CHEESE AND EGG ASSOCIATION, DE KALB, ILLINOIS.

I have been seventeen years engaged in the dairy work. I commenced with twenty cows bought of neighboring farmers, and they were not very good ones. I remember that the first year I received $33.00 per head from the factory, besides some butter made after the factory closed. This poor income was not entirely the fault of the cows, probably one half of it should have been charged to myself, though I did not think so at the time. I had not thought of the cow as a machine that required a certain amount for support, and that the profit of my work depended on what she consumed above the food of support. I had been accustomed to hearing about when hay should be cut to "spread well," and tried to cut mine at that time, and commenced haying after the 4th of July when the clover blossoms were mostly dead, and usually the timothy would be ripe enough for seed before I was done haying. In that way I could get my timothy seed out of my hay. That was considered a clear gain, and I think it was in one sense at least, the seed was worthless to the cows. I did not feel satisfied with what I was doing. I could not figure a satisfactory profit out of my work, and I began to hunt a better way, and did not hunt long to find it either. I began to cut my hay earlier and to feed my cows better, and to test my individual cows and to weed out those that paid no profit, and I was surprised at the number that I had to dispose of on that account.

I believe every dairyman should test all of his cows, then he will know what he is about. He will know what cows

are making him a profit and what are making a loss, and he certainly will know what to do with those that are not profitable. Though I should hope that he would not sell them to some man not a judge of cows, for dairy purposes. They should go for beef.

I believe that with our present small profits, that all the profit might depend upon the time and manner of curing our hay. I know that I have repeatedly had an increase of 10 per cent. in milk from my dairy when changing from late cut to early cut hay, and I could find no other cause for the increase. For several years my principal feed for cows was clover and timothy hay (and the more clover the better, if cut at the proper time), with corn meal and wheat bran. But for the past three years I have shocked most of my corn and cut it up with a feed cutter, ears and fodder together, this makes good feed and I believe is an economical way of feeding corn when we have shoats to follow the stock. The present winter I am cutting sheaf oats with my shocked corn.

I am now feeding to most of my cows 45 pounds of ensilage, 25 pounds of shocked corn and sheaf oats, and 4 pounds wheat shorts and 4 pounds of wheat bran. My ensilage costs me $1.51 per ton including labor of putting in silo, labor of producing crop, also seed and rent of $4 per acre. This is perhaps a high rent. I should perhaps say that I had a very poor stand of corn from the drouth. My ensilage corn yielded 15 tons per acre, but I am positive would have made 30 tons if the seed had all grown.

The ration I am now feeding costs me as follows, per cow per day: Shock corn and sheaf oats, 4.18 cents; ensilage, 3.4 cents; shorts and bran, 5 cents; total, 12.58 cents. I have 60 shoats following my 67 cows, they are fed some whey and wheat shorts but get no other feed except what they glean after the cows. The shoats are doing finely, and I am confident that they are making 40 pounds per day, which should be credited to the feed account of the cows, this would be at 4½ cents per pound, $1.80, or 2.7 cents per cow, which we will deduct from feed account leaving the feed charged to the cows a trifle less than 10 cents per day.

It does not freeze in my cow stable in the coldest weather except it be close by a door. I am warming water for my cows this winter to 75° and feel well satisfied with the results, though I have not received so large an increase of milk as some have done. This might be accounted for partially from the fact that my cows had previously had water freshly pumped, or at a temperature of 48° to 50°.

The first test I made to get the increase of milk from warm water showed 7 per cent. The second trial showed 7.2 per cent. increase, which would amount to $33.45 per month. The cost of fuel in my case is very little, as I use an engine to pump, and the exhaust steam heats the water 35° or to 85° but it cools about 10° before it gets to the tank in the cow yard, so the cows get it at about 75°. I think there are other advantages in warming water besides the increased flow of milk, I believe the animal consumes less feed, and I also believe there is a saving of vitality, and that the animals will keep in better health.

DISCUSSION.

Question — Will you kindly give me the names and amounts of feed that you use in your ration?

Answer — It was twenty-five pounds shock corn and sheaf oats. There was about three-quarters shock corn, and one-quarter sheaf oats, forty-five pounds corn ensilage and eight pounds of wheat shorts and wheat bran mixed.

Question — What would be the butter yield per day of those cows?

Mr. Gurler — I can not give the butter yield, my milk was going to the factory. These sixty-seven cows, some of them had been in milk since last May, but the majority of them dropped their calves from the 1st of September up to the middle of January. The average flow of milk has been running from twenty-one to twenty-two pounds.

Question — What kind of stock were they?

Answer — They are a mixture. A large portion of them are cows that I picked up around the country; it should not

be so. When I commenced dairying I found, as I told you, that my cows were not making me the profit that they should, and I commenced to weed out and raise heifer calves and build up a dairy of grade Jerseys. I raised my butter yield in about nine years up to about two hundred and sixty-six pounds to the cow. The year closing June 1st, 1880, I got gross profits from my cows $83 and some cents each. Now, the abortion commenced in my dairy, and it broke that dairy all to pieces. I tried to bridge over, but I was compelled to sell them, so I got rid of all my grade Jerseys, and I have been buying in to take their places until within the last two years. Now, I am raising some grade Holsteins and I will show you what I lost by losing that herd of cows that I was so long breeding. With the closing of June, 1880, the gross income was $83 and some cents; the average price of the butter sold that year was 26½ cents. Now, for the year closing January 1st, 1885, I got from my cows $60.80 each. Of course, prices were lower, but there was a larger loss in the cows, in the quality of the cows, than there was in the decline of the price of the product. I am working now to get back where I was six years ago.

Question — Can you give us any cause for this abortion coming up in your herd?

Mr. Gurler — I can not. That is a big question; you want to take a whole day if you go into that. I am satisfied that there were various causes for it. I have an idea that what started it in my herd was ergotty grass in wet pasture; that is my idea.

Mr. McKinstrey — I am surprised at this ration that you have given, and I know you well enough to know that there can be no mistake about it, but I am not able to get that into any cow I have got.

Mr. Gurler — I am aware that the ration is large, but we do not try to get our cows to eat all the sheaf oats and the corn.

Mr. McKinstrey — Then we may understand there is a waste there that should be put back against your ration. In

your opinion, how much is that; do you suppose it is ten pounds a day?

Mr. Gurler — No, I don't think it is. I would say perhaps eight pounds.

Question — When this ration is all mixed together and put into a bushel basket, how much would it make, pressed in reasonably well?

Mr. Gurler — We feed a bushel and a half of the corn ensilage. It weighs thirty pounds to the bushel, the way we measure it. We feed also a bushel and a half of this shock corn and sheaf oats; that we count twenty-five pounds. And that is enough for the cow for all day, twenty four hours.

Question — What ripeness do you cut your oats?

Mr. Gurler — I cut oats when they are about one-half turned. I let them lay on the ground half a day or a day, before binding them, and as soon as they are in the shock we put them in the barn, and I am surprised to find how completely the cows consume that straw.

Question — What grade cows do you prefer for butter?

Mr. Gurler — I believe actually there is nothing that will make more butter, from the same feed than the Jersey, or Guernsey, or Alderney, some of those small cows, that are bred especially for that purpose. You can not expect to get the highest type of the beef animal and milk animal in the same breed.

Mr. Fish — My experience is that with the number of acres you have got, you ought to raise all all your feed on your own acres.

Mr. Gurler — I have bought very little corn, maybe four or five hundred bushels, only, this winter. I will say this, my farm will produce twice what it would when I bought it. It had been run to grain twelve years, and it was the poorest farm in the neighborhood when I first purchased it, and there is nothing in the neighborhood that will excell it at the present time.

Mr. McKinstrey — Is it true that one acre of fodder corn, and one acre of good sheaf oats will feed a cow twelve months?

Mr. Gurler — I have not demonstrated it, but I have no doubt but what it will do it.

Question — How many milkers do you have for your sixty-seven cows?

Mr. Gurler — Five milkers. When I was at the farm, I used to milk twenty myself.

Question — You speak of the Alderneys as a breed of cows, isn't it a fact that the Island of Alderney is merely a British fort, there is no stock raised there, and the officers brought Jerseys over there?

Mr. Gurler — I don't know. The Jerseys and Alderneys go into the same herd book.

Question — What corn do you use for ensilage?

Mr. Gurler — Burrill & Whitman.

Question — Have you used the cream separator?

Mr. Gurler — Yes, and we get a larger per cent. of butter.

Question — Is it as good?

Mr. Gurler— Yes, better.

Question — About how many pounds did your factories aggregate this summer, when doing your best?

Mr. Gurler — We made about 3,000 per day.

Question — Why is the separator better than the common way of separating?

Mr. Gurler — I can only give you my theory of that. I think it is reasonable. The cream is removed immediately from the milk. There are always more or less impurities in the milk, and I claim that the sooner you get the cream from these impurities in the milk, the finer goods you are making.

Now, when we first commenced making centrifugal butter, there was considerable fault found, and I think with some cause, as we didn't cool our cream. We let it cool off gradually, but we found that after a few weeks, the flavor was gone from our goods. Then we found that when we cooled the cream immediately from the separator, that we could make a more delicate, higher flavored butter, than from any other plan.

Question — Can you tell us the proportion of the increase of yield in the centrifugal over deep settings?

Answer — Well, I think it is safe to say that in the factory we get an increase of twenty-five per cent. I doubt whether that would be as large where you take your milk right from the cow and separate it. I doubt if a separator right on the farm would produce as large an increase in the butter as it does in the factory.

Question — What is your process of cooling your cream?

Mr. Gurler — We use what we call a beer cooler. It is a series of pipes like a steam radiator; we borrowed the idea from the brewery. We will say it is four feet long, and the coils run back and forth, and we put generally ten or eleven of those pipes one above the other, and we run cold water through them, and then we run the cream down on the outside, dripping from one to the other, and it cools the cream off very quickly. The cream is run into a little V shaped trough on top, with holes on the bottom, and it goes dripping down over those cool tubes and within two minutes from the time it leaves the separator we can have it cooled down to fifty-five degrees. It works automatically. There is no trouble having to have a man to start it or stop it. The men forget it sometimes, but it does no hurt, we find it a saving of labor.

Question — What is the cost of the separator and engine, and the machinery to run it with, what does it cost for the plant?

Mr. Gurler — You can buy the De Laval Separator for about $290, and there's the expense of some extra shafting usually. Where we put them into a creamery we generally have to put up shafting in order to get the motion and there is some belting. The Danish Western costs I think some $375. The fifteen inch, and the twenty-five inch costs more. It is something that a person that is interested, can learn very readily about.

Question — I want to ask your opinion as to the relative profits of dairying, whether it is more profitable for an ordinary dairyman to make his own butter at home, good butter I am talking about, or to sell his milk or his cream to the creamery?

Mr. Gurler — That is a bad question to ask a creamery man. My milk goes to the creamery, and I am the largest patron. You go down into Kane county, Illinois, the oldest dairy county of our state, and you will hardly find anybody that is making up their own goods. Now, they are intelligent, they know what they are doing. There's plenty of them do well enough to shame me, right out, with my dairy. You can draw your own conclusions from the facts.

Question — Do you use the oil test?

Mr. Gurler — We do so in our gathered cream work.

Question — I have always contended, that take the average intelligent farmer, or the farmer's wife, with a dairy of from six to twelve cows, that he can get more money out of that twelve cows to make his own butter, than he can to send it to any creamery.

Mr. Gurler — I will tell you what I would agree to do. If you lived in my neighborhood, I would give you just as much as you could make, for the milk, and I would take the rest for the profit.

Mr. Hunt — Which do you think for the best interest of the farmer, to patronize a creamery or a cheese factory, which is the most profitable to establish in a neighborhood?

Mr. Gurler — Well, there are several things to be taken into consideration. If you want to raise your calves, you want some skim milk and you had better have a creamery. If you don't want to raise any calves or any pigs, perhaps cheese would hold its own then. If I was fixed right in some certain locality, and understood the locality, I could answer that question, but I might make a reply here that would not fit at all. In the west they must raise hogs to utilize their coarse feed, but take it down below, and down east, the majority of them don't want any pigs. The answer to that question depends entirely on the conditions and surroundings.

Question — Does the oil test give better satisfaction than the old method?

Mr. Gurler — Why, there's no comparison at all as to satisfaction. There was no satisfaction at all to the creamery men, nor to the better element of your patrons by the old

way. The only party that was satisfied with the old way, was the man that was beating you all the time, that is our experience. When we changed from the old plan to the oil test, we found no man disatisfied except the man that had been beating us before we made the change.

Question — Do you use the oil test in any cases except in the case of gathered cream?

Answer — No.

Question — What do you give for milk in your neighborhood?

Mr. Gurler — We gave for January a dollar thirty, a hundred pounds, delivered at the factory. In December we paid a dollar twenty, I think it was, delivered once a day.

Question — What do your patrons do with the skim milk?

Mr. Gurler — In the summer time the milk is all taken away for feeding purposes, for the calves and pigs, they bring the milk to the factory, and by the time there's three or four hundred pounds of milk in the factory the separator is started, and every man that comes after that, drives right around and gets the sweet skim milk and takes it home. We put a price on that sweet skim milk at ten cents a hundred, we find we have to do it, in order to make the distribution, if we did not, we would have to put a man there to look after it or else the last man would get nothing. That is considered in the price paid for the milk, the price is fixed with that in view.

Question — What is your lowest price?

Answer — Forty-five cents.

BRAN—ONE OF THE ESSENTIAL FEEDING STUFFS IN WISCONSIN.

BY PROF. W. A. HENRY, MADISON, WIS.

With your permission I will take up the subject of the chemistry of feeding, which is a most difficult and perplexing one, and yet so essential is it to any further advancement of our knowledge of feeding that I ask that you

patiently follow me. Let me be considered the teacher to-day and before me is the class in agriculture ready and willing to follow in what may be said. By looking at the subject you will get an idea of what the short-course agricultural students are being taught down at Madison, or rather you will be able to note how the subject of stock feeding is taken up and treated from the scientific side in the class-room. It is but proper to note in this connection that this part of the subject is taught by Dr. Armsby, and not by myself at the University, but as he is not at this meeting, and this is one of the most important topics that can come up, you will pardon me for encroaching on ground not exactly belonging to me, as our duties go at the state University. The class will please give close attention and follow carefully the lines of thought.

Something more than a quarter of a century ago scientists began to enquire into the mysteries of feeding and nutrition of our domesticated live stock. They asked themselves such questions as, what part of the food sustains life? what portion goes to make the fat? what part the bones? what part the muscles? and so on; questions that thoughtful men ages and ages ago must have asked again and again but received no intelligent answer because of the lack of the sciences essential to working out the problem.

When fairly at work at the problem these scientists found themselves analyzing the various feeding materials given to our animals, also the solid and liquid excrements, as well as the bones and tissues of the carcasses. But more than this, they conducted careful feeding trials, analyzing everything supplied to the animals and everything passing off. Now they fed one variety of food and noted the results upon the live animals, and now another food article. Patiently the chemist and physiologist have worked for more than a quarter of a century at this difficult problem, and though much still remains to be done, they have found out so much and revealed so much that is wonderful and valuable, that we may well review some of the results to-day.

Here is one of the most important facts established by them. The constituents of all food articles used by man or

beast can be reduced to four classes, carbhydrates, fat, protein, and mineral matters. The fats can be put with the carbhydrates since they serve the same purpose in the body, and as for the mineral matters, we need take no account of them just here since in any properly balanced food ration we may give to man or beast there is sufficient of the mineral elements to make all the bony growth the animal needs. We are then in this lecture only to consider the two classes of organic compounds entering into our food stuffs, the carbhydrates and protein.

Chemically a carbhydrate is made up of the three elements, carbon, hydrogen, and oxygen, represented by the three letters C, H, O. The protein substances contain in addition to the three elements, carbon, hydrogen and oxygen, the element nitrogen, so that we have for the symbols of our protein compound the four letters, C, H, O, N. Can the class recollect these elements? A few repetitions of the names and symbols will fix them I think.

The carbhydrates are the cheapest components of our feeding stuffs. They are such as woody fibre, starch and sugar, hay, straw, cornstalks, etc. Fats and oil are also made up of carbon, hydrogen and oxygen. Protein is represented by the white of an egg, the cheese of milk, lean meat, dried blood, also bran, shorts, oil meal, and cotton seed meal, are rich in protein. We will not need to think long to see that the carbhydrates are the cheapest articles in the markets, while the protein is the dearer. It will be remembered that the element, nitrogen, enters into the composition of the proteins, and to this we may ascribe their greater cost.

And now to the needs of our live stock as to the consumption of carbhydrates and protein. The German scientists found out that a cow weighing say 1,000 pounds requires daily when in full flow of milk a ration which shall contain not less than 2½ pounds of digestible protein, and 12½ pounds of digestible carbhydrates and fat in order to keep up life and furnish the milk required of her. While finding out these important facts they also learned the amounts of these articles in the various feeding materials used upon the farm for the maintenance of our live stock. For example, a hun-

dred pounds of Indian corn contains on an average about 8½ pounds of digestible protein and 70 pounds of digestible carbhydrates including fat. Wheat bran made by the roller process is found to contain 12 pounds of digestible protein and 47 pounds of carbhydrates and fat.

In a similar manner the components of all our feeding materials have been determined, so the farmer can judge very fairly by using tables containing these results how to feed and waste none of his foods by over feeding one or the other constituents.

This question of properly mixing rations has been quite fully discussed by Dr. Armsby in the third annual report of our experimental station, where will be found extended tables of the composition of most of our feeding materials. Prof. Stewart treats of it at length in his book entitled "Feeding Animals." It is not my purpose in this lecture to dwell upon the general phases of the subject, but to hold to one or two important details.

Now comes the point I desire to make. We have on our farms as a rule and abundance of the carbhydrates available in the form of hay, cornstalks, straw, marsh grass and ensilage, but lack a proper amount of protein to mingle with these to get the most satisfactory results. Even our Indian corn, as I have shown in this article, is not so very rich in protein as compared with its carbhydrates. In the same way, the roots we may grow do not furnish the desired protein. Where then shall we turn for this protein, this material which is essential to making the cheese of the milk and the lean meat of all our live stock? Fortunately, we in Wisconsin have a source of supply in the bran of wheat, and as the greatest mills of the world are just over the border of our state in Minnesota, we are enabled to get an abundant supply at comparatively low rates.

But, I am met with the statement by some farmer at the outset that, "he does not consider bran better than so much sawdust." The man who makes such statements simply does not know what he is talking about. Let us study the composition of the wheat grain for a little. Nature has so arranged the wheat grain that the carbhydrates are

stored in the shape of starch in the interior portion, while around the outer portion of the grain is disposed the mineral and nitrogenous matter. In grinding the wheat it is the purpose of the miller to get just as much as possible of the starchy matter, so all his inventive genius has exerted itself to construct machinery for this end. The roller process takes the starchy portion out almost entirely and leaves the outer husk of the grain rich in protein and mineral matters. The starchy inner portion of the grain is just the part of the wheat we can best spare when it comes to cattle feeding since we have so much of the carbhydrates on the farm in the straw, hay, stalks and even the corn meal itself.

It has long been known that a carbhydrate in the plant is formed by the union of carbonic acid gas and water. Carbonic acid gas comes from the air to the plant through the leaves and water through the roots. The combination of the two is brought about by the vitality of the plant. Since the carbonic acid gas is from the air and water from the soil, the carbhydrate resulting from the union does not draw any fertility of itself from the soil. But maybe our doubting Thomases are not yet convinced on this matter of the value of the bran from wheat.

They will not deny the truth of the statement that the inner part of the grain is starchy, and practically almost divoid of nitrogen and the mineral matters. Nor will they deny but that wheat is an exhausting crop, long known as such by all who have tried it for any length of time. If wheat growing exhausts the soil, and the outer portion of the grain only is made up of that which exhausts them, the fertility of the wheat farm goes mostly with the bran.

Now let us look at the situation. Wisconsin has been for years gradually changing from wheat growing to mixed farming and dairying, with the most satisfactory results, both financially, and in regard to the fertility of our fields. To the north of us lie the great wheat sections of Dakota, Minnesota and British America. There the farmers are robbing the soil of its fertility much as we did a score of years ago. In Minneapolis, and other cities, much of this grain is

ground, and the products sent eastward by rail; trainloads of bran cross Wisconsin to New York and the eastern states to be fed out at a cost of something like eighteen dollars to twenty dollars per ton to the farmer there. Why can't we stop this current of fertility passing across our state, and first feed it to our cows, getting one value out of it from them, and then by putting the manure it furnishes on the land enrich that. Here is an opportunity to restore to our fields the very elements that were sold off, years ago when wheat growing exhausted the lands. How is the opportunity to gather in the fertility the Dakota farmers are so surely taking from their lands, and making Wisconsin rich.

When we feed a ton of bran to a fattening steer already fully grown we get back almost all the mineral matter and nitrogen in the manure. When we feed this same bran to a cow in full flow of milk we get back about seventy-five per cent. of all the mineral matters and nitrogen. Provided, in all cases, we save all the liquid excrement. If these are wasted most of the nitrogen and potash are lost. The phosphoric acid only for the most part passes off in the solid excrement. Let no more speak against the great value of manure made from bran or any other food for that matter, until he has carefully saved both the solid and liquid portions.

I hope in what I have said you have followed me, and I judge from the attention received that I have started many out on lines of thought, which must eventually prove of great value and profit. Though agriculture is not yet a science, there is much science in agriculture. Were you with us at Madison you would hear these subjects discussed at length, time being given to each topic so that each cow follow and fully understand as we go along.

Crowded as I am here for time it is a difficult task to attempt and carry out so much in a brief half hour.

Music — Ladies' Quartette — "Corn Bread."

DISCUSSION.

The question of cooking feed being brought up Prof. Henry replied; We are trying some experiments in feeding cooked and uncooked food, we are feeding shorts to our pigs very succesfully, when we came to feeding the shorts, I said to the man in charge of the experiment "Now, feed the shorts dry," after a while he came to me, and says, "the pigs can't eat them dry." I said "They can try it." He says, "I have tried it, it takes forty minutes for a pig to eat his dinner." I replied what is that pig's time worth for forty minutes. Now, there it is, if it takes forty minutes for his dinner, he gets the saliva well mixed with his food; our experiments showed us so far as we have gone that it does not pay to cook the feed for hogs. I would not wet the feed, nor cook it, for calves nor hogs, so far as my personal knowledge goes.

Question — What are the comparitive merits of buckwheat bran, and wheat bran?

Prof. Henry — I could not tell you at this time, the chemical analysis of buckwheat, but I promise to look it up, and report it in "Hoard's Dairyman," within two weeks.

Question — Does the additional value of the bran fed hog, make up for the additional value of the protein feed?

Prof. Henry — I think you will find that corn is pretty nearly as dear as bran, owing to your location so near the mills. But I would feed shorts which are rich in protein also to hogs, and feed bran to the cows. Bran does not seem no food for hogs as does shorts.

Question — What is the difference between bran and corn in protein?

Prof. Henry — Bran is about one half richer than corn in protein.

The convention adjourned to banquet.

BANQUET.

WEDNESDAY EVENING, FEBRUARY 9TH.

MENU.

MEATS.

Roast Turkey. Boiled Ham. Baked Chicken.
Corned Beef. Pickled Tongue.
Ragout of Lamb.

RELISHES.

Chow Chow. Celery. Mixed Pickles. Pickled Crab Apples.

SALADS.

Chicken Cabbage. Potato.

BREADS.

Adirondack Corn Bread.
White Bread. Rye Bread.
Rolls. Graham Bread.

JELLIES.

Currant. Plum. Orange. Crab Apple. Lemon.
Charlotte Russe.

CAKE.

Fig. Chocolate. Fruit. Mont Blanc.
Lemon. Coffee. Ice cream cake, Doughnuts.
Sheboygan, Lodi and Burnham Valley full cream cheese.

FRUITS.

Fancy Valencia Oranges. New Messina Oranges.
Florida Oranges. California Oranges.
Tea. Coffee.
Jersey Cream. Holstein Cream. Hereford Cream.

TOASTS.

"Since brevity is the soul of wit, I'll be brief."

Toast Master — HON. J. M. MORROW.
Song — "Throw Dull Cares to the Winds."—Male Quartette.

1. Our Guests — Response by D. F. Jones, Esq.
2. Our Hosts —"The Spartans "— Response by Prof. W. H. Morrison.
3. The Cow—America's Queen—Response by Col. R. P. McGlincy.
4. Our Farmer Boys and Girls — The Pride of the Present — The Hope of the future — Response by C. R. Beach, Esq.

*Song —"The Dairies of Wisconsin"— Ladies' Quartette.

We sing you a song of Wisconsin's chief glory,
The fruit of the dairy, so rich and so great,
Which renders Wisconsin so famous in story,
Her butter and cheese are the pride of the State.
The vales of Wisconsin are sprinkled with flowers;
What beauties in nature are rivals of these?
Where the cows of the dairy in summer's bright hours,
Are laying up treasures of butter and cheese.

Chorus: The sweet golden butter, the creamery butter,
The premium butter, the cream of the cheese.

The fruit of the churn is the crown of our table,
Our Governor tells us "the cow is the queen;"
Her horn is exalted, for now she is able
To kick up her heels of the vile margarine.
All hail to Wisconsin, her hills and her waters,
So ample the lover of nature to please;
And last, but not least, are the dairymen's daughters,
The lovely purveyors of butter and cheese.

Chorus: The sweet golden butter, the creamery butter,
The premium butter, the cream of the cheese.

5. The Survival of the Fittest — Butter versus Oleomargarine—Response by Stephen Faville, Esq.
6. The Creamery and Cheese Factory — The Farmers' Corporations—Will they ever become Monopolies? — Response by Capt. C. A. Hunt.
6. Wisconsin, the State we live in — Why Should the Spirit of Mortal be Proud?—Response by Hon. S. N. Dickenson.
8. The Dairyman—Popular and Prosperous to-day; Will he keep his *head*, or will the strength of his Butter and Cheese take him off his feet?—Response by H. B. Gurler, Esq.
9. The Farmer of the future: Will his Muscle be saved by the Educational Schemes of the Present?—Response by Prof. W. A. Henry.
   Song—"The Happy Farmer."—Double Quartette.
10. Good Resolutions; Spontaneously Formed; Indifferently considered; Systematically disregarded—Why?—Response by Rev. J. D. Searles.
11. The Weekly Newspaper — With its possible power for good, ought we be satisfied with Present Results?—What can the Matter be?—Response by W. D. Hoard, Esq.
12. Eight Hours a Day's Work —When will Milking time be? — Response by P. R. Ginnis.

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*This song was composed by G. W. Root, Esq., of Sparta, for this occasion, and is dedicated to the Wisconsin Dairymen's Association. Air: "The Old Oaken Bucket."

13. The Stock Farm—Only the best *Grades* should be allowed upon the Premises—Shall this Rule be Applied to the Proprietor?—Response John Gould, Esq.
14. The American Hog—With an Even Chance he will "root" Himself into Respectability, and have the World for a Market—Response by Geo. A. Austin.

Music—Sparta Band.

The association has never been better entertained at any of its meetings than it was by the ladies of Sparta.

Five hundred were seated at the first table, while numbers were waiting that could not be seated.

The supper was all that could be desired, while the singing by the ladies and gentlemen's quartette was undoubtedly the best the association had ever listened to.

Male Quartette — Messrs. J. R. Skillman, D. C. Beebe, D. F. Houghton, A. W. Wilson.

Ladies' Quartette — Mrs. W. T. Sarles, Miss Addie Brooks, Mrs. F. P. Stiles, Mrs. Fernando Bancroft.

MORNING SESSION.

Thursday, February 10th, 1887.

President Morrison in the chair.

THE CHEESE PROSPECTS IN WISCONSIN.

BY J. A. SMITH, CEDARBURG, WIS., ASST. ED. HOARD'S DAIRYMAN.

In attempting to say something befitting the time in which we live, and the occasion that calls us together, I take it for granted that it was not in the mind of those who gave me the topic to discuss, and who planned the most of the programme of this convention, that I should say much, even if anything about the technical part of cheese making. The methods of manufacturing have been so often explained in papers that have been presented by many of our most skillful manufacturers, and which are on record in the reports of this association, and which the fostering aid of our noble state has enabled the society and the legislators of

the state to distribute to all who wished to receive them, precludes the necessity of a discussion of the elemental truths and principles involved in successful cheese making. It would seem that the most that can be taught by books — at least of the broad, basic principles of the art — had been already put within the reach of those who are desirous of learning and practicing those principles. What is comparatively new, that has already arrived and has been tested, and what is seen to be coming, and may be nigh — nigher than some of us may think — may very properly be alluded to by myself and others, and their merits, if any, discussed.

While it is well to be on the alert for that which may really add to our stock of useful knowledge, I am unable to discern so as to comprehend their utility, anything really new that can be made to bear on the production of excellence in the aggregate product, that will begin to compare in the way of benefits with that of putting in better and far more universal practice some of the vital things, a very large portion of the cheese-makers of the land already know; but which for various reasons, a considerable portion of them do not use their knowledge so as to make it tell on their products. Some, because of inefficiency in purpose and accomplishment; but more from an unwise greed to make a yield in weight at the time of sale at the expense of quality and to beat the yield of a near rival. This may please the short sighted-patron of to-day, but it gluts the market with a poor article which afterwards checks consumption; and so returns a kind of vengeance to the purchaser later on in the season in the form of a generally depressed price, for such goods, that the more honest and penetrating who continuously make first-class cheese, do not feel. The same principles apply to cheese making as to bread making, so far as ordinary consumption is concerned. We eat but little bread that is either baked to a crisp, or that drawn from the oven before it is half baked. The good house-wife knows that the temperature of the oven, and the time her loaves are left in it causes the material of her bread and cake, into which she has poured, it may be half her soul to compound just right, to come out so as to fill her

with pride and joy; or make her shriek vexation and disappointment. It is just so with a cheese, it is a glory and a joy to the boy who realy knows a good one when he sees it forming and maturing in his vat; and if he has any decent sensibilities and pride, and regard for his own and his patrons, money, it is a quarter section of hell for him, when he sees, just as plainly that he has humiliated himself and may be, lost $20, or $40, as quickly and as certainly as to put up the same money on the slow horse.

As it is the half good and half mean head that the majority of the world gnaws and bolts, so it is the half good and half nauseous and odoriferous cheese that the majority of the world nibbles at, or finally cooks into a soup and eats as poverty's cheapest method of supplying to its customers an animal food that in a measure satisfies nature's cravings. This may be a kind of good for the very hungry poor, who work at low wages; but it is not "business," on the part of enlightened citizens of the U. S., who milk cows for profit instead of the fun of the thing. All the good cheese is as eagerly bought at good fair prices, and consumed, as is the gilt-edged butter, that is made and placed promptly where consumers can get it. One of the missions of this organization is to add in diffusing the knowledge, and induce the use of it to vastly improve the quality of that we produce, to the end that it may be sold for better prices and also open a paying market for double treble and many times more than the 400,000,000 pounds we now annually produce. Our people are able to eat it, and will eat it, if made as palatable, as we know it to be nutritious and healthful and cheap, when rightly made, cured and preserved.

The most common defect in cheese that comes to the notice of our largest and most intelligent dealers in, and makers of cheese, is the one partially alluded to; the half-manufactured stuff that is full of half-decayed whey, that like a dead mackeral in the moon-light, both stinks and shines, as the tryer is drawn out, or it is paraded in small shining slices on the table to victimize the unwary and disgust the connoisseur, until it slowly disappears, or is finally

thrown to hogs, that by the way, know better than to eat it, unless they are half starved and do not stop to sort anything. It is because we make so much of it, and because the Canadians make so little, that they are walking to the front as exporters of choice, firm, sweet, meaty, cheddar cheese; and it is because the northeastern and lake shore counties of our own state make their curd for young America and Flats, and serve cheddars in the same way, that the cheese of those counties lead those of every state in the Union, with the possible exception of that portion of New York that makes honest full creams. Now there are the cold facts about the business, and I have to say that the "outlook for cheese," of the poor kind described, is not encouraging. It is neither as valuable or as honest as a straight half skim, that is well made. The half skim is simply lacking in one good element. All the rest are well-utilized, and made papant and nutritious, the other has too much of an element that soon becomes vile, and spoils all the rest; and that is the reason so many say they do not like cheese, and they wonder who eats it, "anyway." The thing to do, is to use the skill and integrity to make the cheese fit to eat, then have it where the people can get at it, and it will be consumed just as certainly as J. M. Smith's strawberries are, when "baptized by immersion" in cream and granulated sugar.

I have thought sometimes, and the more I think of it the more I am inclined to believe it would be a good thing thing to do, to have a fraternity of chesse-makers, who could pass examination as to knowledge of their business, before a dairy commissioner who is an expert, if we had one, as we ought to have, or from an agent, and who could obtain a certificate of his skill, to show to his employers, before he was allowed the chance to manipulate the property of others. I would put them on the same footing of teachers of our public schools, who can draw no public money, until certain officials find them competent to teach. I would have such certificate annulled if the owner lost his skill, through subsequently argued stupidity, deliberate meanness, or bad habits, all of

which I have seen attach themselves to men who were once good cheese makers; or I would make the dairy farmers measurably safe by their having the right to call for a new certificate annually, of this association, till we got such a dairy commissioner, if a stranger to them was to be placed in charge of their milk. Such a certificate would be worth something to a cheese-maker; would give him reputation and a pride in his vocation, and it would give a confidence in the business that farmers do not feel now. I feel that there is something in this, when I am told as I often am, by farmers in all parts of the state, who say, if we only had some one to take hold and do, as you say, may easily be done by those who know how. We would go to buying cans and have our factory in operation next spring. They know of stupid failures, and that snide mechanics walk through a cheese or butter pastory, and on the strength of their assumption and cheek, offer to take charge of hard earned milk, without positively knowing just what to do with it, and such farmers hesitate. It would help them some, and give the skilled cheese-maker exemption from much. It may be ill-founded suspicion, if he could prove an expert official had said he really understood his business. We ask proof of competence, certified to by officials. On the part of our teachers, doctors and lawyers, before we entrust to them charge of our educational forces, our loves or our fights. Even the shoemaker and the minister must give some proof of competence, before we entrust them with our (soles — souls.) To have the cheese we do make, made better, cured more scientifically, and preserved sweet after it is partly "cheesed," and kept so till the time for consumption arrives, is one of the most imperative demands of the business.

Another thing that is in sight, when we take an "outlook" in behalf of the cheese industry — and which, as I view it, will alone deter the larger dairymen, with improved butter cows — the only kind the specific dairyman can afford to feed — from withdrawing from it in favor of the butter factory, or the large dairy on the farm for making butter only — and that is an equitable division of the factory funds

on the basis of as nearly exact justice as possible, instead of on the basis of *pounds* of milk, some of which is worth much more per 100 lbs., to make either butter or cheese, than some of that with which it is pooled. When we hardly knew there was a difference, or if suspecting or knowing that there was a great difference in the yielding capacity of milk for cheese-making uses, we then had no way to quickly and certainly determine that point. There was then some excuse for pooling milk to be paid for on the basis of weight alone, and of assuming that one pound was as good as another, if it was as whole as when drawn from the cows. But now we not only know there is a great difference in the money value of a given number of pounds of milk from different cows and herds, but also have the means of showing that value in a short time. Some of us have also got pretty well out of the ignorance and fog that enveloped us as to there being any but a skim cheese value in milk that is not quite fully measured by the per cent. of butter in the same whole milk. In the whole milk of our common cows, or in that of grades of the improved dairy breeds, I hold *it is hunting for small game* to concern one's self about that portion of the value of milk for full-cream cheese-making, that is not defined by the amount of butter there is in the same milk; for if the caseine be found in excess of the normal yield — that is, more caseine than butter, — it is an indictment against the cow, and if put on trial individually as a producer of dairy goods, she would have to be condemned as partially a skim-cheese cow, no matter what her breed or how long her pedigree, for standard, full-cream cheese can not be made with more pounds of caseine than butter in it.

So, for all practical purposes, and for the achieving of substantial equity betwen patrons and purchasers, the oil-test, now so largely used to determine the butter yield of gathered cream, can be and must be used to determine the value of milk, whether used to make butter or chese, or for domestic uses.

Through its use, there may be a cessation of "the battle of the breeds," as between the manufacturer and the far-

mer, and between patrons with different grades of milk, and each may choose the breed that he may judge will serve his "general purpose" best, and at the same time have a consciousness that he has got his own, and no more. Or, if he wants more than his own, may know he can't get it, from honest co-operative work.

CRITICISMS CONSIDERED.

I am aware that this point has been criticised, and that it will be the main line of defense by those having the interests of low-grade milk at stake, those who will first and most strenuously resist the introduction of the oil-test into our cheese factories, to determine the value of milk for cheese making. It is germane to the discussion that we examine the point closely, — for we are after the "bottom facts," — and see what there is in in it, — see if the criticism is valid, and so fatal to the new measure of milk values.

The criticism made on the use of the old-fashioned cream gauges, to determine the value of milk in the cheese factory, or that of the test churn, that used cream separated by the gravity process, were both open to valid objection, because they depended upon that method to get the cream; and it was alleged, doubtless truthfully, that the small-globuled milk of some of the breeds was slow in separating, and so did not show up the full amount of butter-fat there actually was in it, but that it was all utilized in the cheese. This claim may be admitted to be valid, because it probably to a degree, is true, but whether true or false, makes no difference in the presence of an oil-test churn, — because that will show up any per cent. of butter-fat there actually is in the milk, as it lets no dodging atom of fat escape. Under the old system, if we depended upon the per cent. of cream obtained, it was shown to be only guess-work at last — a kind of pointer, that might lead us to watch a suspected patron, but determined nothing that would either convict of crime, or give us an entirely just method of dividing the proceeds of sale.

So, for practical purposes, we have had but a bungling way to determine the relative value of the different messes

of milk delivered at our factories, and have none yet, unless we have it in the "oil-test-churn," or in some of the semi-chemical tests that are not so certain, or so easy of application of the oil test is. This method, as applied to gathered cream has become standard; and it is just as reliable for testing gathered milk.

I come now to the point in which it is claimed that a measure of the butter value of milk is not an exact measure of the caseine or cheese making value of it. I have no doubt that part of this view is, or was, founded on the assumption that cheese is largely composed of caseine, whereas it is only about, one-third of the main elements, — unless the cheese is a pronounced skim. The caseine diminishes or increases from that proportian as the cheese increase or diminish in richness, in their composition. In point of fact the 32 per cent. of water and the 35 per cent. of fat, are just as essential parts of the standard cheese, as the 30 per cent. of caseine, and the 3 per cent. of salt and ash. So it is just as absurd to claim merit for an excess of caseine in milk, as it would be to claim that an excess of alloy added value to a given weight of precious metal. Excess in either case, means a lessened per cent. of the more valuable part. This must be so, as long as it is true that one atom cannot occupy two places, or two atoms fill the place of one.

But, says the interogator, suppose the caseine is in the milk, as one of its main elements, whether it weighs more or less, should not its weight be ascertained, and paid for as an entity, and not have its value measured or assumed, by comparison with another element that is entirely another substance?

This is a fair question, and I propose to meet it fairly, and also liberally, well knowing that upon giving a satisfactory answer depends the practical utility, — not the absolute chemical truth, — involved in the proposed method. So I say, of course, if the ultimate last possible scruple of difference had such a practical value as there is between gold and copper, for instance, that exist without a law of relative proportions. But the practical facts, and the law of rela-

tive proportions, come in, and show that in milk of common cows, and of half and three-fourth grades of the improved breeds, the butter value of their milk, is also the cheese value of the same milk; or so nearly so that we have not reached a cheap, simple and practicle method of otherwise determining so nearly, the exact difference that ultimate chemical analysis might show.

It is conceded that there are abnormally constituted cows, one kind of which give milk so rich in fat that rennet will coagulate it only at great waste of fat into the whey. The Jersey cow, "Landseer's Fancy," at the latter part of her season of milking gave *cream* instead of milk, of which less than 4 lbs. made a pound of butter; and her average for the year was a pound from about five lbs. In other words, 100 lbs. of her milk made 20 lbs. of butter. I was curious to know whether the caseine in such milk was in it in the same proportion that it exists in normal milk, and so addressed her owner, Col. W. J. Webster, of Columbia, Tenn., one of the noted breeders of Jersey cattle in the U. S. He kindly replied that as he had no interest in cheese, for his business, that he had never made the test to really know; but he was of the opinion that caseine could not be so present in the milk of his cow, for it would lead to the conclusion that it must have in it about 37 lbs. of solids per 100 lbs. besides the sugar of milk. So he opined the amount of caseine in the milk of said cow, was as abnormally small as the butter yield was large. So I say we must take little or no note of such exceptional cows, for we do not have them in commercial dairying. On the other hand, we must take no note of such exceptional cows as make their products violently the other way — those that yield only 2 or 2½ lbs. of butter per 100 lbs. of milk. No matter what per cent. of caseine such cows put in their milk, if they did not put in at least an equal amount of butter, so long as caseine is worth only two cents per pound, they could only be developed into a paying investment by an early use of the butcher knife.

So we come back to a consideration of the normally constituted cows that we have to deal with, mostly — the mil-

lions of common cows, and the hundreds of thousands, it may be by this time, of the grades; and with them I say that the relative proportion of fat to caseine is so nearly alike that the butter value, which is about ten times the value of the caseine, is a near enough practical measure of the value of the whole milk. To make this plainer — the normal proportion of fat to caseine is as 80 pounds to 70 pounds in a ton of milk. With the butter at 20 cents and caseine at 2 cents, $17.40 or 87 cents per 100 pounds — 80 pounds of butter and 80 pounds of caseine, $17.60 or 88 cents per 100. One cent gain nominally — but how produced?

Why at a per cent, of loss in fat in 100 pounds of cheese, which if noted by the buyer, would as certainly cut down the price, as that skim cheese can not be sold for as much money as full creams, when both parties know what they are about, and deal "on the square." Now let the proportions be more diverse, say 70 pounds of butter and 80 pounds of caseine in a ton of milk, and there is a row at once, and the buyer if he knows his business, will, it may be, sarcastically ask you to show him some of your full creams. The butter in a ton of such milk is worth $14, the caseine $1.60; milk worth 78 cents per 100 pounds instead of 87 cents, when the proportion of butter was as 8 to 7 instead of 7 to 8 — or the cheese is 9 per cent. poorer. Somebody is in for just $1.80 on that ton of milk, unless it is paid for according to its butter value. It will be seen there is a difference in the value of the butter alone of $2, but in the caseine value of only 20 cents, or one-tenth of a mill on each pound of milk. When the proportion is wider than that between cows, it proves that the one is too poor to be suffered to live, and the other is giving milk too rich for honest, profitable pooling with that of the first unless it is paid for at true value.

So I come to the conclusion that the very small loss that fine figuring will show the milk, with excess of caseine, in it is subjected to, ought to be gladly shouldered in view of the fact that the excess of fat in the milk of cows, constituted the other way, has rescued the cheese from being adjudged skims; and so given the man with low grade milk more money in a price he has not helped proportionately to

make, than he has lost in caseine value. If there is any whining it might more properly come from the man who contributed the fat.

Until something more exact and at the same time quick and practical way comes along, I shall hold the oil test is the better way and ought to be used to pro-rate cheese money. General education on the facts it reveals will make a demand for it, and its use will show each man what he actnally puts into the pool; and therefore what he is entitled to draw out. It would leave men at liberty to select the breeds they desired, and relieve them from all apprehension of loss through pooling with low grade milk, and thus neutralize their inclinations to pull out of a factory for the purpose of getting the justice that they do not now get. It would at the same time teach those who through poor feeding and unwise selection of cows are getting but meager returns, (and part of that out of their neighbors,) that they should have better cows, better fed, and the honest consciousness that the pay they got was their own earnings.

I want you to note that I have purposely avoided the naming of breeds in this discussion, because it is the solids in the milk which I am concerned about and the way to pay for them so that justice between man and man maybe impartially meted out.

The encouraging "outlook for cheese" will loom up to us just in proportion as we make it inviting to the consnmer. Let us have no fear of that; and let us forever abandon the idea that we can force a poor article down the throats of the people, only as we sell it ruinously cheap, because it is poor. It is the cheapest animal food that is produced within the confines of civilization, even when sold at double the price that obtain for beef and pork; and the American people are fast discovering the excellence of that which is made measurably good. A few years ago we made 200 million pounds and exported 100 millions. Now we make 400 millions, and export only about the same we did then. So much has the make in Canada cut into our export of cheese. But the increase of consumption at home, is about double that which Europe ever took from us, in any

one year. This market is solid, and will be subject to no national whims, or foreign rivalry. We can soon double the demand if we stop making poor cheese, and put the business on a basis that shows the most intelligent producers of milk they are getting just what they earn.

While it would be assumiug to play the role of the prophet, in saying what is in store for the cheese interest, it is certain we discern no clouds. There is enough of the quality that is below first class. But for fine goods the market may be said to be bare, and the price is high enough. The impetus given the butter business, through cream-gathering, the use of the Centrifuge, and the desire to increase the mouths on the farms — as the new and better methods of farming imperatively call for — have taken over to the side of butter and calf-growing, a rather disproportionate share of the cows, so that cheese-making has a more open field before it than it has had for many a year. Our people are not learning to consume more butter, per capita, than they have ever done, when their earnings allowed of it; but they are fast learning to eat cheese, and can save money by eating ten pounds, where they now eat one. So it is a wide field for occupation. Let us "go in, and win!"

Mr. Gurler was called to the chair.

DISCUSSION.

Mr. McKinstrey — Have you tested the milk by the oil test, and are you satisfied that it is as exact as we admit it to be in the test of cream?

Mr. Smith — I never have applied it, but the fact is it is just as good as applied to milk as to cream. It don't take any different apparatus to test the butter value of milk than it does of cream.

Mr. Hoard — This past summer at a creamery at Fort Atkinson, tests were made of the milk of sixty-four dairies for milk.

The milk was received at the Separator creamery from sixty-four dairies, and figured up by the oil test showing so

much butter, and when run through the separator and churned, the result came out only two pounds apart. This gives some indications of the value of the oil test if accurately handled.

Mr. McKinstrey — Will you give us the variations from the lowest to the highest of those sixty-four?

Mr. Hoard — I think the highest showed in value 5 pounds of butter to the 100 pounds of milk, and the lowest showed 3 20–100; this was milk drawn to the creamery and run through the separator.

Mr. McKinstrey — What I want to get at is to test each individual dairy.

Mr. Hoard — Let this pencil represent the glass tube. Fill this glass with five inches of milk. Care should be taken to stir the milk thoroughly so you have a fair sample, whether of the herd or of the individual cow, stir it thoroughly all together and take a sampleof the milk. Supposing Mr. A. has a herd of twenty cows and he has brought his milk to me and wants to sell it. Five inches of this milk is put into this tube. That represents a fractional part of a pound. These tubes are put into ice water and held there twelve hours, until all the cream is forced to the top. The tube is then held for twelve hours more at 70 degrees or thereabouts until the cream is thoroughly ripened, ready for churning. It is then put into a shaker, or test churn, and churned, or thoroughly shaken in the tube; or you can shake it in your hand this way until it is churned. Then set it into water, say at 125 degrees and gradually increase the heat to 150. If the separation should then take place, all the butter fat in that milk will come to the top in a small layer of olive colored oil. If the separation is incomplete and the caseine does not separate thoroughly, you re-churn this milk, cool it down, re-churn and re-heat it, and the second time generally makes a perfect separation. Then there is a table calculated very closely upon certain bases of the gravity of milk and the gravity of cream, and the per centage upon that; a pound of butter all calculated out, and a little rule measured off into decimals of a pound. This

little rule is applied here and you can measure. Now, we will suppose that the butter fat measures 10 on this rule. Turn to the scale and follow the eye right out here to 10, and it says that there will be 2 lbs. and 38–100 lbs, of butter in 100 lbs. of such milk. Suppose it measures 20, I carry my eye out here to this figured out scale, and it says there will be 4¾ lbs. in 100 lbs. of such milk. Now, the value of this invention we are only on the eve of, but it is going to work a revolution in your mind and every other man's mind that takes hold of it. Parties who have been perfecting this machinery have about completed an individual test churn for farmers' use by which any farmer can test his cows. Now, you will be very much surprised when you come to test your cows to see the wonderful variations there are in butter fat. At the St. Paul test for instance, the Jersey cow "Grace of Davenport," tested 31 at night, and 12 hours later the same amount of milk tested 22; a loss of ⅛ butter fat in twelve hours. Now, what is the meaning of this? Nobody knows, except you reason from certain standpoints as the disturbance of the nervous machinery. The deposit of butter fat, in my opinion, is largely due to the harmony of working in the nervous machinery of the cow, but I am not going into that.

Let me give you a little illustration. I tested a herd of cows by hand in this way, long before I had any scale to figure out the exact value, I could only get the comparative value. Say, cow Nos. 1, 2, 3, 4, 5, and up to 10. I have seen cow No. 1 show double the butter fat in her milk that cow No. 2 had, and the farmer declaring up and down that cow No. 2 was his best cow.

I stepped into a man's herd of cows one day to buy a cow. I said to him, "What will you take for a cow?" Says he, "I will take $50 if you pick her out, and I will take $25 if I select her." I thought I would figure on the man a moment, and I says, "which would be your pick?" He showed me a little, scrawny cow. I said, "what would be your pick for yourself?" and he picked out what he considered his best cow, giving 40 pounds of milk a day. I looked the cows over, and made up my mind that the $25 cow was the best

cow for butter, and I asked him how much milk she gave, and he told me she only gave 25 pounds of milk. I took her home, and she made 1½ pounds of butter a day, 15 pounds of her milk made a pound of butter, and the other only made 1¼ pounds for her 40 pounds. He had never made any test of his cows.

Mr. McKinstrey — I know how hard it is to explain this test tube to an audience of farmers. A gentleman tried to do it at the Minnesota convention last week, and he became utterly befogged and had to give it up, but the next day a test was made on the platform, and the tubes were passed all through the audience, and it demonstrated to the minds of every one that they could take a bottle and go through the process themselves. I have factory men that can make a test as accurately as I can, after they have been shown once.

Mr. Alston — Three or four years ago this convention hired a man to go through the state and instruct cheese-makers in the making of cheese. I would like to have Mr Smith tell us the result of that work.

Mr. J. A. Smith — It is rather an ungracious task to say anything against anyone, especially if they are absent. At one time I was tolerably well convinced that the system that was commended to us was entirely correct, but I came to that conclusion, as I afterwards learned, because I judged of it when it was very hot weather.

Those gentlemen who are acquainted with the cheese business, will remember that there has been a great deal said about dipping the cheese when it is entirely sweet. That is, getting the whey off, and getting what acid you need in the curd alone, without the whey. While it was very hot weather, and the milk had gone on to acidity anyway, it seemed to work all right, but when I came to operate in cold weather, I saw it would not do, we had to keep the curd in the whey till a very slight acidity was developed, in order to get our cheese as firm as it needs to be to be worth anything, and those that took undoubted faith in making cheese that way, lost considerable money. That was the result of that operation, and it teaches just what I

was trying to enforce just now, that there must be a certain degree of acidity in the curd, in order to make the cheese just as it should be.

Mr. Gould — Is there any difficulty in getting that acidity, if you only keep your curd warm?

Mr. Smith — That is an open question yet with us, as we have not the facilities for so keeping it, which I understand they have to some extent in Canada. I guess Mr. Hoard rather thinks that is one reason they are beating us. That they keep their curd covered in the vat, and keep it warm until they develop the acidity, even after the whey is off, but our factories are not equipped for that, and we sour in the open air vat in the room. A great many of them are entirely too cold, and I think it would be a saving to us, and I guess the chair will bear me out, that there are millions of dollars lost every year, because of cold curd put to press.

Mr. Gurler — No doubt of it.

Prof. Henry — If you were running a test churn in connection with your cheese factory, how often would you think it advisable to make a test of your patrons milk?

Mr. Smith — Where we were gathering the whole milk, I would not consider it necessary to take it every time, but where you gather the cream, there is so much variation in the butter value of the cream, that it must be done every day, and with every mess.

Question — Would it be essential to have an engine to run this test churn, or could it be run by hand power?

Mr. Smith — Mr. Curtis is the man to answer that question, he is making something to run by hand, I believe, are you not, Mr. Curtis?

Mr. Curtis — Yes sir, and will be offered for sale in a month, if not sooner.

Question — How many can you make, that will run by hand, how many tests at once?

Mr. Curtis — Anywhere from ten to fifty bottles, our present idea is three sizes; No. 1, holding ten bottles, No. 2, fifteen bottles and No. 3, holding twenty bottles.

Question — Don't the Canadians have a warm room to keep their cheese in, and keep it warm that way?

Mr. Smith — No, sir; I understand they have a cover for the vat and shut it away from the air, during the process of cheesing. I think the cover is canvass, sometimes they have boards, I believe, but generally pretty thick canvass, perhaps painted.

Question — Suppose you were dissatisfied with the milk of one patron, what way would you go to work to prove that the milk was not right.

Mr. Smith — I would show him just what it was, and tell him if he was not satisfied with what the test churn said, and if he didn't want to bring it, he could keep it at home.

Question — What about skimming and watering?

Mr. Smith — Let him water it all he wants to. If I am paying only for butter fat.

Question — How can we prove it to him, right then and there?

Mr. Smith — I have no way, really, of determining, unless the oil test comes to my aid. I can set the milk in an old-fashioned cream gauge, and make a pretty good case out — enough to suspect him, perhaps.

Question — We want to get at it the easiest way, and prove it without putting the man out.

Mr. Gurler — Let me give you a little of our experience. We were testing both by the cream gauge, and the lactometer, and we found two or three patrons we were satisfied were watering their milk. We tried it over again, until we were thoroughly satisfied, and then we went out and watched him, and found him in the very act of watering it. You take the cream gauge, and the lactometer, and you will find out just how it stands.

Mr. Gould — The question is, how are you going to break it to him gently?

Mr. Gurler. You don't want to break it to him gently. Give it to him, butt end foremost. I would not depend even on these appliances. I would use them until I was pretty well satisfied, and then put a man out to watch.

Mr. Hoard — I was in Canada this winter, attending a convention, and they had a fine lot of cheese on exhibition. They are right after us and ahead of us, and they are wise

in their generation, wiser than the children of light in Wisconsin, a good deal. The government appropriated $3,000 in that province; $1,500 to each association. They appropriated money for Prof. Robertson, who has been making a lot of experiments on different kinds of rennet, and salt, etc.

Now there is one wise thing that they do, and we can hardly find a cheese factory in the state that will do it; if a patron is discovered to be dishonest; will not furnish good milk, he is turned out of the factory, he cannot get into another one.

Mr. Smith — He has got to sell his farm cheap too.

Mr. Gould — Is that the reason they come to the United States?

Mr. Hoard — Yes, they say that owing to the emigration of the people from Ohio, they can't be sure about things.

Question. I believe Prof. Arnold, a year ago, recommended a thorough airing of the curd, during the cheesing process. Do the Canadians differ from him on that?

Mr. Hoard — They are getting a different understanding somewhat this winter. They are growing away from some of the features of Prof. Arnold's system. I understand they draw the whey when it is sweet leaving just enough in the vat to work it. A great many of the cheese-makers of Wisconsin develop the acid in the whey. That is a bad feature. The Canadians carry on the process of acidification by heat. They are using the whey vat but very little.

They make a cheese that will ripen in six months from making, not three months. They use about an average of five ounces extra good rennet to the thousand pounds of milk. Prof. Robertson showed us cheese there that astonished me. Cheese where eight ounces rennet extract was used to the thousand pounds of milk, and that cheese was fine a few weeks ago, but he did confess that the manipulation of the curd was very thorough

Question — Their method of covering the vat and keeping the air from it will have a tendency to cure the cheese slower when it goes into the curing room?

Mr. Hoard — I think so. They make a very close cheese.

They make a cheese to ship to England that will be good six months from the time it is made.

I will publish in a week or so the returns from Ballentyne's factory, showing the prices they get each month, which will show that they lead us about one to two cents a pound. Another thing. It takes about 10½ pounds of milk in Canada to make a pound of cheese. They make a drier cheese. We make a moist cheese and can not keep it as long. We take a less number of pounds to make it but we have to pay for it in the end.

Mr. Monrud — Mr. Hoard mentioned that the Canadians had gone back from Prof. Arnold's system about the heating of the curd, they have gone back to the old English cheddar system.

Mr. Hoard — I understand that they are developing the acid more than they did two years ago in Canada.

Question — Prof. Arnold stated a year ago that the developing of the acid destroyed the finer qualities of the cheese.

Mr. Hoard — I think that depends very much on whether it is done in the whey, or whether it is done in the sink. I think that is the great distinction. The Canadians are developing the acid more in the matting process, but not in the whey. They are a longer time about making their cheese. They rarely get their cheese to press, until about four o'clock in the afternoon, and we have hundreds of cheese-makers in Wisconsin, who are out trotting horses before three o'clock.

Question — We haven't got the oil test in our factories in this part of the country, how are we going to find out whether the milk is watered?

Answer — Test it the best you can.

Mr. Fish — I find if I know the standard of a man's milk I can tell within a pound to the hundred by the lactometer.

Mr. Hoard — What percentage of butter to the hundred pounds should there be, to make it standard?

Mr. Fish — Four pounds of butter fat, I consider standard milk. That makes me think of something that is going on in the legislature. Mr. Luschsinger has already introduced a bill there about standard milk. There has been no

such thing defined by any law of our state that I know anything about. We have no such law, such as Massachusetts, which is 12½ per cent. solids, and this law, if it passes, will describe a thing that has not been defined.

A gentleman — I have listened to this discussion about watching farmers, to see whether they are bringing good milk to the factory, and it is all proper. But may be we could do some good work in enquiring whether those cheese men do the best they can in working up the cheese. Now, I am no cheese-maker, but I patronize a factory, and in the summer time when the milk is the richest, we find the richest part of the butter fat in large quantities on the whey. Now, it is discouraging to undertake to furnish good rich milk and see it go out that way. Now, is there no process of making cheese whereby they can retain that richness?

Mr. Smith — Yes, if the cheese is handled rightly, and the coagulating element i s put in, in the right proportion, and the man understands his business, he will run but very little of the butter fat into the whey. In a case such as the gentleman speaks of, I should want the cheese-maker to show up how many pounds of milk he takes for a pound of cheese.

SECRETARY'S REPORT.

Mr. President, and Members of the Association: — The past year I have paid out for office expenses $80.15. This has been paid for stationery, postage, freight and express on reports, etc. A bill of items furnished the executive committee. The treasurer's report shows that we received $200 in premiums from the world's exposition at New Orleans. There were $400 due the association in premiums, but after a long time fifty cents on the dollar was offered, if a receipt in full was signed. It was thought best to accept this as it was doubtful if any would be paid, if allowed to run much longer.

Respectfully submitted,

D. W. CURTIS.

TREASURER'S REPORT.

Mr. President and Members of the Association:

The following itemized report, is made, showing the source from which all moneys paid into the treasurer's hands were received, and the disbursements paid on orders from the secretary, which I hold as vouchers:

RECEIPTS.

	Amount in hands of treasurer	$457 87
	Memberships	211 00
	Entries at dairy exhibit	12 50
Mar. 11,	From state treasurer	1000 00
June 8.	New Orleans premium on butter and cheese, exhibited by the association — (Received fifty cents on the dollar of the amount awarded	200 00
	Total receipts	$1881 37

DISBURSEMENTS.

1886.		
Jan. 27.	Maj. Alvord, expenses attending R. C. meeting	$62 50
28.	John Gould, expenses attending R. C. meeting	36 50
	Mrs. J. Howard Kelly, short-hand reporter	50 00
	Mrs. J. Howard Kelly, expenses	16 25
	Prof. J. B. Harris, expenses	12 86
	J. A. Smith, hotel bill	6 50
	Prof. L. B. Arnold	50 00
	Prof. L. B. Arnold, expenses	55 00
	Republican and Observer, for printing	2 50
	Express on cheese, to Richland Center	2 00
Mar. 29.	N. L. Iames, premium	3 00
	Mrs. E. S. Robinson, premium	5 00
	Mrs. A. M. Bragg, premium	3 00
	C. F. Fargo, premium	12 00
	Stephen Favill, expenses attending Richland Center meeting	14 70
	Harris Bros., premium	10 00
	D. W. Curtis, salary, 1886	75 00

Apr. 2.	Ex. committee meeting	
	W. D. Hoard	$5 00
	W. H. Morrison	5 00
	C. R. Beach	5 00
	S. Favill	5 00
	D. W. Curtis	5 00
	H. K. Loomis	6 25
26.	W. H. Morrison, advertising	17 65
	Mrs. E. S. Robinson, reading paper	9 50
May 6.	Joseph H. Real, expenses to pass Oleo. bill	25 00
June 18.	D. W. Curtis, use office and sending reports	60 00
	Freight on reports	85
Sept. 13.	W. D. Hoard, printing	8 50
16.	Mrs. W. E. Bush, prize essay	10 00
Oct. 4.	Democrat Printing Company	10 00
Dec. 6.	Stephen Favill, attending Ex. Com. meeting	5 00
	Chester Hazen, attending Ex. Com. meeting	7 56
	H. Smith, attending Ex. Com. meeting	5 00
	W. D. Hoard, attending Ex. Com. meeting	5 00
	W. H. Morrison, attending Ex. Com. meeting	5 00
	C. R. Beach, attending Ex. Com. meeting	5 00
	D. W. Curtis, attending Ex. Com. meeting	5 00
	H. K. Loomis, attending Ex. Com. meeting	5 00
	Express on cheese	46
1887.		
Mar. 2.	D. W. Curtis, office expense	18 15
	Exchange on drafts	2 00
	Postage	60
Total disbursements.		$653 33
	Balance in hands of treasurer	1228 04
		$1881 37

Respectfully submitted,

H. K. LOOMIS,

Treasurer.

Report adopted.

LET US BUILD A SILO AND FILL IT.

BY JOHN GOULD, AURORA STATION, OHIO.

The question in regard to the silo as a factor in dairying is a very prominent question, and why? Because we must make a profit on our dairy produce, and get it from a yet

cheaper ration for our stock. The silo has come as a part answer, at least, to that demand for a cheaper ration. We are not farming on the same conditions that we once were, the high prices can not and never will return, I think, but the intelligent farmer who takes advantage of his situation may secure by some means a more cheaply produced article with its quality unimpaired, and at least receive as much compensation for his labor as he did under the old methods. Now, I am not an ensilage crank, and do not believe in entirely abandoning the old methods for new, but I do believe in bringing in the silo as one of the factors in the preserving of more cheaply produced food, to be fed when it can come in at a vantage point. It transfers summer over into winter, when the dairyman may make twice times as much money out of his products as he does in the summer, and that is the solution of the whole question.

The silo changes the season and puts winter dairying at our command with its higher prices. The silo has been in great dispute for four or five years, and it is only within the last two years that the objections to it have wholly or nearly ceased, but now it is scarcely an open question whether the silo is an advantage in winter dairying. If we winter our cow on ordinary meadow grass, we shall find one year with another, that it will take nearly or quite two acres of hay to winter our cow successfully, and to this we must add a large amount of grain, if we hold her in perfect condition, and keep her in good flow of milk.

Now, where hay is worth as it is with us, $12 per ton the year around, to sacrifice an acre and a half or two acres to the support of a cow through the winter, is a great expense, and if we can chance upon some means where we can till an acre of land so it shall winter three cows and possibly four, with half the grain that we have been feeding with the hay, then we have chanced upon a lower priced ration, and yet brought it within our power to get a big yield in the winter instead of the summer. Last summer in Ohio, the average price for seven months for milk was seventy cents a hundred pounds delivered to the creamery, to-day it is a quick sale at $1.50.

WHY IS ENSILAGE BETTER THAN HAY.

Simply because it is more easily digested; that is a point which we have not understood in the past. We did not know what ensilage really was. One of our learned professors took me in hand, and said, "You are not feeding ensilage now, you are feeding preserved feed." I find that in these matters we have kept ahead of the agricultural colleges, except perhaps Prof. Henry. He is the only man I know of in the agricultural colleges that has kept up with the farmers of the country in the practical study of the silo.

We now come to the point, what is ensilage to-day as compared with ensilage three years ago? It is just the difference between wishy-washy corn fodder sown broadcast, three bushels to the acre, and good field corn of the best variety sown twelve quarts to the acre. It is a matured crop having good feeding qualities against a crop of undeveloped immaturity. If we sow broadcast we get a little stalk of a sickly color with no sign of an ear, and it is likely that the tassel will only be partially developed. It is so crowded that the sunlight can not get into it. But a great splendid growth, standing so that it gets lots of sunshine, its broad leaves forming, and reaching into the air, and at the proper time the ear developing. Why didn't the other grow like that? The natural function of corn is to develop an ear and the moment you deprive that stalk of that function it has nothing to live for. But you take this three bushels of corn, and sow it over eight acres instead of on one and see the difference. Sow it in drills three and a half feet apart with the kernels about 5 inches apart in the rows, and cultivate it. We pay the same attention to it as to field corn, and then we get the matured ear. If we take that little, sickly, crowded stalk of dwarfed growth and send it to Prof. Henry, and he will tell us it has only got ten per cent. feeding value, but you take a stalk of field corn and send it to him, when the ear is just going into the milk, and he will send us back word that it is worth from 28 to 33 per cent. feeding value. If we put that ensilage

into a pit in August, and the other kind into another pit in September, a month later, the one pit is worth three times that of the other. Here was once a great objection to ensilage. It became very sour in the pits, and the question was how to avoid it.

When that was solved, then the dairyman could compete with any ration that was brought into the field in the production of choice butter and cheese, and it all hinged on the maturing of the cornstalk. Then we were taught that ensilage must be put a whole pit in a day, and then weighted. Then there was no cooking process to hold the qualities of the food in the same condition that it went into the pit. There was a souring process going on which must to a greater or less extent be a food consuming process, so we adopted a slower filling process where the food was cooked.

Having laid down these few premises, let us go to the silo itself, and see how we shall build it.

The first silos built in Ohio were built in pits with stone walls, so that all the ensilage put down had to be hoisted over the walls, which made it very expensive. Then the next step was to build them with masonry, but partially above ground. Then the next step, was to build it with lumber as part of the barn, and then in some cases, to sacrifice one of the bays of the barn, for we found we could take one-half the storage space in our barn and fill it with ensilage, and then have room to rent, because we could put in so much more ensilage than of hay. So the transition has been from the stone silo to the grout, and then close to the barn as an addition to it, and then into the barn itself. The important thing is that it shall be built so the air will not come in from the sides, and so that water will not come in from the bottom. We need first, a dry spot on which to set our silo, and if we make the walls air tight, we have got all that is needed, the danger of frost was all a phantom — no one ever yet saw a silo freeze up. You need not guard against the frost more than the walls of the silo itself, because the heat of the silo alone is more than the atmosphere on the sides will overcome, so you need not be afraid of its freezing up. The weighting of the silo was at first a serious matter, and in

the first silos in Ohio, we put on half as many tons of dead weight onto the cover as we put tons of ensilage under it, so that in putting it on and off, we handled just as many tons of material as in handling the ensilage. Now the weights are all gone. We have simply a cover with two or three loads of hay on top, so when we get ready to feed we simply feed off the hay, roll up the tarred paper for another year, and we are ready to feed out the ensilage.

The great trouble in building a silo, is to build the corners so they won't pull apart, and the sides so strong they won't spring out. Ensilage weighs fifty pounds to the cubic foot. 2x10 studding set up 15 to 18 inches apart make a wall that no pressure will throw out of perpendicular if properly secured at the top and bottom.

There are two plans for building the silo in Ohio. First, lining the sides with two thicknesses of boards, one up and the other down, with tarred paper between. Three silos were built in my neighborhood last year, lathed and plastered on the inside, doing away with one thickness of board, and the tarred paper, and I must say, they seem the most perfect silos in our state. The inside wall then is only one thickness of boards nailed strongly to the studding and use the wall to nail the lath to, put the lath on bias, so that they will cross the cracks of the inside lining of the silo, then you get the strength of the lath in additon to the walls of your silo. When you go to plaster, give the mason fifty cents more and have him surprise you by putting on extra strong morter, so it gets in between the cracks, and you have a silo that will last you as long as a cement silo. In making a wooden silo the corners must be made secure so they will not pull apart, and it is best to cross the ends of the board lining about four inches at the ends and put in three scantling in the three angles of each corner, locking them and if you nail those on with four rows of nails, then you have got a box that can not be pulled apart, or spread in any way, and you have secured a solid corner, and if you have the walls and sides solid you have your silo complete.

HOW BIG SHALL WE BUILD THE SILO?

Build it twice as long as it is wide, and as wide as it is high. A silo 30x16 feet and 16 feet in depth, will hold about 150 tons of compressed ensilage, ample to winter 25 cows, and this fodder should be grown on six acres of good ground if well cultivated.

This silo should cost you about 75 cents a ton capacity, if built with lumber and tarred paper alone; if it is built out doors as an addition to the barn, then of course you must put on in addition, a roof to protect it from the weather.

The great expense of filling a silo is now greatly reduced, and with it a better feeding result obtained. Years ago a in filling a silo, a man would hire all the teams and men up and down the street, and it cost $40 a day. Now a farmer with two hired men and a boy, fill a silo just as he does any other work on his farm. This brings down the cost from 15 to 20 cents a ton for actual labor in filling the silo.

I have a list of prices, where everything is charged, even $4 an acre rent for the land, and time for the man that looked over the fence, to see the fodder corn grow, and $1.75 is the largest expense I have ever known to be charged against a crop. Now, figuring from this, your ration costs you less than five cents a day, minus the bran.

When you come to feed a cow 30 pounds of hay a day, worth $12 a ton, you can see where the difference is with successful dairying with ensilage, and successful dairying with hay.

If we get nice thick grass or clover, we shall find that the average cow in summer eats not far from 80 pounds of succulent food. Now if we dry that grass we shall find it weighs from eight to twelve pounds in hay. That eighty pounds of green grass gives as a result, two big pails of milk; the cow holds her condition and goes through the summer. You dry that grass and feed it as eight or ten pounds of hay in winter, and how much milk will you get? You will starve her to death in sixty days. You give her thirty pounds of hay, equivalent to 254 pounds of clover, then you have got a ration that will support your cow nicely

but it won't give you a very large yield of milk. Now, why didn't the cow do as well on the dry ration as on the green? Simply because it took two-thirds more power, to digest and assimilate the dry feed, than the succulent food, and she had to consume needless food to digest the whole. That question of digestion is one of the great questions that faces us to-day, and that is where the silo comes in at an advantage. In feeding ensilage, we are giving the cow food that is digested at a less expenditure of stomach force. It is in a condition of easy digestion, not only from the fact of its green character, but its slight cooking has rendered it more so, and experiments go to show that the slight chemical change that it has undergone in the silo, closely resembles the first stages of digestion, and actually saves the animal so much preparation, just as warm water promotes and assists in digestion of food.

HOW SHALL WE CUT THIS ENSILAGE?

With a reaper. In Ohio it is all done with sweep rake reaper. Don't try to cut three or four rows at once, but take one row at a time, and then you will have no difficulty at all, even if the corn is twelve feet high.

How shall we get this up to the pit with the least expenditure of money?

Provide two men, each with a team, and a low, truck platsorm wagon, to the rear of which put a trailing plank with cleats. A good man will bring up ten loads a day, and do the loading himself. He takes up one of the gavels of corn fodder, and walks up the plank and puts it onto the wagon, and then another, and when he gets to the barn, he drives right along opposite the big ensilage cutter that is placed on a level with his wagon. This ensilage cutter should be large enough to get forty or fifty tons a day into the pit. This man takes a bundle of corn fodder off of the wagon, puts it into the cutter, and it will very soon disappear, the cutter will take care of it and so on, cutting up a load in about 15 minutes. Then you only have to have one man at the silo to attend the machine, and to keep the ensilage in the pits leveled down, and assist in unloading. So

you see you have three men and two teams that bring up twenty tons of ensilage, and if you are hiring men at $18 a month, yon see it won't cost you very much, about eight cents per ton, besides the farmer's own personal labor. We used to try to fill a pit in a day, but now we are two week, in filling a large silo. And why? We want to cook the ensilage, just as a lady cooks her straw-berries or canned fruit. We make the ensilage cook itself, we simply put it into the pit layer by layer, and allow it to stay there until it reaches a heat of 125 degrees. Chemical changes come, the starch and the sugar are cooked, and if we can cool it off, right at that point, to about 80 degrees, no farther chemical changes can happen, unless something occurs to warm it up again, which never happens, as it must have air in abundance when you have once cooked it and cooled it off, that ensilage would remain years without hurting, if kept sealed away from the air. This heating process is obtained by rotation in filling the pits. You put in pit number one to-day number two tomorrow, and then number three the next day. If you have only two pits to the silo, then don't do as long a day's work. The thoroughbred farmer of the future is only going to work ten hours a day.

This also gives it a chance to settle down, as it will by its own weight. When the silo is filled, level it down and then cover over the surface with something like tarred paper, tha will keep out the air. The slow heating and filling up with the layers of fresh ensilage, has driven out all the air. There is nothing but a little gas there that will do no harm. All we have to do is to keep out the air, so we cover with tarred paper lapping usually three or four inches, and then lay on common inch boards. You can lay them lengthwise of the paper, and when you have got that done spread two or three loads of hay over the surface, and that is all the weight you need. And you have not done a very big job after all. Now what have you got for feed? You have a big ration and a cheap ration. You have got a ration that enables you to double the stock on your farm, without skinning your farm to do it. The men who have built one silo, have often built another, and the man who had thirty cows has now

sixty. He has been doubling the income of his farm, simply because his dairy ration is twice as much in winter as in summer, (*i. e.*), the silo has doubled the keeping capacity of his farm.

Briefly I have built this silo; briefly I have given you a few results, and if you don't believe it, you don't know how to build a silo, and only have to see such men as Hiram Smith, F. C. Curtiss, I. J. Clapp, Dr. H. S. Weeks and a score of others, making milk and butter this winter, cheaper than it is now possible to do on summer pastures.

DISCUSSION.

Question — How do you get it out without letting the air in?

Mr. Gould — Imagine this box to be twice as long as it is wide, by the old process we were obliged to either dig them into a bank or the ground, so as to get over the top. Now our stalk cutter is placed here, we have a carrier on it the same as your thrashing machine. It lifts the ensilage over the top of this pit to-day, then to-morrow you swing it over to the other pit, then the next day back here, until you have finished.

Now make your door at the end of your silo, that is the easiest. Make your door to open iuwards, but do no not use any casing inside the wall, and making your casing flush with the wall, and make an old-fashoned battened door, and when it is in its place it is true with the walls. Cut the door into sections of two feet long, put it in its place, using a little bit of tarred paper, as you shut the door together, and then it is perfectly air-tight, but don't use any hinges, the ensilage will keep it shut. When you get ready to feed, take the cover off of one pit, and feed as evenly as possible from the surface and rake it down to this door. Make the door come up to about four feet of the top of the silo. When you feed, you take and rake to this door, here is your wheelbarrow to catch the ensilage, you fill it and go down the aisle and throw "Block" one shovel full, and "Brindle" another.

Question — How do you cool the ensilage?

Mr. Gould — The moment you put a load of cold ensilage on to the warm ensilage, in a very few hours the heat will have gone from the lower into the upper layer.

Mr. Hoard — If I understand you correctly, Mr. Gould, the silo is about a paralelogram, and it is divided into three parts?

Mr. Gould — If it is a sixty foot silo, it should be in three parts.

Question — Now, I am not clear as to the manner of these partitions. How were these partitions put in, and after you empty the first one, do you have a door in the next partition?

Mr. Gould — Yes, there is a door in each partition, made exactly as the one in the end.

Mr. Hoard — Is the partition put in solid in the sides?

Mr. Gould — Yes, it is necessary, because when you feed out one, this puts the pressure on the partition, and you throw your partition over, unless it is fastened to the sides pretty strongly.

Question — So that each partition is framed in solid?

Mr. Gould Yes, when you get ready for you partition, all you have to do is to find the studding that come the nearest, and notch your board into it, and you have got your solid partition.

The convention adjourned to meet at 1:30 P. M.

AFTERNOON SESSION.

The convention met pursuant to adjournment at 1.30 P. M., Pres. Morrison in the chair.

Music — Male Quartette.

DISCUSSION RESUMED.

Question — What is a proper ensilage ration?

Mr. Gould — From 50 to 60 pounds, according to the size and capacity of the cow. In full milk, she will want that with about 6 to 8 pounds of bran per day, to balance the

ration. Six tons will be ample to winter her if she is kept warm and comfortable.

Question — Why plant corn so thin as 10 to 12 quarts pe acre?

Mr. Gould — The object is to get an ear of corn and make your cornstalk develop and store up a stock of food. The more feed you can get off an acre, the more profitable it will be.

Question — What is the difference in yield between cows fed on the best of hay and grain, and ensilage and bran?

Mr. Gould — About 25 per cent. in favor of ensilage. The butter increase is about 15 per cent. A cow fed on ensilage will shrink 25 per cent. in milk if it is taken away from her and the best of dry rations substituted.

Mr. Gould — There is one thing I forgot to mention this morning; that the feeding value of 2½ tons of matured field corn ensilage, sowed about 12 quarts to the acre, is equal to one ton of the best meadow hay you ever saw. That is, field corn ensilage, with an ear of corn on nearly every stalk. This has been decided after months of experiment in feeding cows for winter milk. Mr. Blair, a neighbor of mine, tells me that if a man should come now and offer to give him hay delivered in his barn, he would not give over two dollars a ton for it, for value in feeding for winter milk. It would, he says, be cheaper for me to raise my own ensilage.

Mr. Austin called to the chair.

Mr. Gould — I just received a letter from a man in Ohio who built a silo and filled it with late clover. This gentleman is a large producer of winter milk. He says: "We are getting along famously this winter feeding ensilage, the cows like it, and give large messes of milk. It did not all rot, as some of my neighbors predicted it would. A few inches around one corner spoiled because the air came in where insufficiently covered. It comes out just 80° warm, and full of juice, and cows and calves, hogs and horses all like it. We shall put up as much again next year." This is unsolicited evidence, gentlemen.

Mrs. Robertson — Were not those cows of Mr. Sibley's that gave an average of one pound of butter a day, fed on ensilage?

Mr. Gould — Yes, they were fed 250 of the 365 days on ensilage. He had very limited pasture. The main rationof those cows during the year was corn ensilage.

Mrs. Robertson — How is it about the odor? Does that affect the flavor of the milk in feeding, or is there sufficient unpleasant odor in the stable to produce an unpleasant effect in the milk?

Mr. Gould — I never knew it to have. There is an odor of ensilage peculiar to itself, but it is not anything so far as we can find, that will affect the flavor of the milk or butter, unless subjected to it for hours.

Mrs. Robertson — Can you tell us why Prof. Roberts condemns feeding ensilage?

Mr. Gould — Prof. Roberts was put on the grid-iron up here a few weeks ago, and he said: "I am forced to confess it was nothing chargeable to ensilage, either in its influence on the milk or butter. I made as fine butter as ever in my life, but the prejudice of the consumers was against it, and they would not buy the milk or butter if they knew I fed ensilage, and I was getting fancy prices for milk and butter."

Question — In making ensilage, would you put in clover with cornstalks?

Mr. Gould — You can not put cornstalks and clover in the same silo at the same time. The clover takes on heat so much quicker than corn fodder, that your clover gets rather to warm before the corn fodder has reached the proper temperature. Then again, your clover is in the silo weeks before your corn fodder.

Mr. Allen — What about putting in the corn whole?

Mr. Gould — You can do it, but you must weight it quite heavily. It is almost impossible to lay them so the air won't get in. Then when you come to feed it out, you have got a tremendous job on hand. You have to get it out in sections with a broad ax, as we used to cut those old cider cheeses when you and I were boys.

Question -- What temperature is it when you call it cooked or done?

Mr. Gould — 125 is properly the cooked stage; if you cool it right down at that point there is no danger of re-fermenting.

Mr. Linse — I have had a silo five years. I have met with a good many difficulties. I found that if I wilted my hay too long, it got so dry on the outside that I think it caused mold running down in one of my silos. Then I have found the heavy weight in the middle sags down and the stuff will be carried towards the walls and the mold run down alongside the walls, and into the middle.

Another thing, I would not advise to cut it and let it lay a great length of time; if a good rain shower gets on this heavy stuff, you never can get it dry, and it don't want to be put in with any moisture on it. I think the best way is to cut it in the morning, and haul it in the afternoon.

Do you find it advisable to cut one day, and haul the next?

Mr. Gould — This year we cut fodder corn one day, and hauled it in the next.

Mr. Linse — The trouble is if a man has a large amount to put up, it takes too long. After you once begin, you have to rush on your business; you can't be at it weeks and months, especially in our climate a man can spoil a whole with frost.

Mr. Gould — That is easily obviated by having a partition in your silo, and filling one end one day, and the other the next. I think that if you cut down your clover in the morning, it will wilt nicely so that you can start putting it in after dinner.

Mr. Linse — In regard to the covering. It is advocated now that you don't really need any weight. On one of mine, I put on about four inches of clay, and another one I have weighted in the old-fashioned way. I opened that one just before I came from home, and I still think the old way the best. By weighting it heavily you overcome this uneven settling, so I think next year I shall put on more weight.

Mr. Gould — The most perfect cover I have seen this year is damp straw that was packed very hard, and then a load of hay put on that, and no tarred paper or anything of the kind. Mr. George Austin has one of the largest silos in Wisconsin. I would like to hear him tell about his silo.

President Morrison took the chair, and Mr. Austin addressed the convention as follows.

Mr. Austin — I will take just three minutes to fit out a silo. You remember that summer ended at night, and winter opened in the morning, this year. When that came my cows were upon as fine pasture as could be produced in northern Wisconsin. They were fed four quarts of bran twice a day in the stable. As quick as it came cold nights they were stabled nights and fed dry feed.

The next morning after it froze up I opened the silo and commenced feeding ensilage. I gave 25 lbs. a day at first and gradually raised it to 50 lbs. to the full grown cows; in one week the flow of milk increased about twenty per cent. I was milking about thirty cows; they were strippers. The thing was a revelation to me. I had been trying to solve this problem of low prices, and I believed that they had come to stay. I thought that this discovery of the silo was a solution of that problem. My cows give as good returns as I got in the summer, and it costs me less than ten cents a day to keep a cow, grain included. The expense of putting up the ensilage I figured out, cost me 71½ cents per ton. Five men and two pair of horses cut from the field and drew to the silo, and put in, forty tons a day. In feeding out this ensilage, I discovered that my dry cows and steers kept taking on flesh, as rapidly as they did on pasture grass, and I think it is the solution, not only of the dairy question, but of the beef problem. I think that with what we know and what we are going to learn on this subject, we can successfully compete with the men on the plains where it costs them nothing to feed. My silo has two thicknesses of walls and two thicknesses of paper between the walls; the whole silo is 44 feet long, 16 wide and 18 high, divided into three compartments. At the bottom and top of the centre posts

I put an inch iron rod and drew it up tight to keep it from spreading.

A silo must be built strong. I open one pit at a time, and dig it out from the top with a common four or six tined fork.

Question — Does it freeze on top?

Mr. Austin — No, sir; when the thermometer went down to 44° below you could put your hand on the ensilage, and you would feel a little frost, about as you would feel it a frosty morning on the grass.

Question — Is not a masonry silo a failure in this climate, without there is a dead air space?

Mr. Austin — I have been told it is.

Question — How will timothy do for ensilage?

Mr. Austin — Timothy will not make good ensilage. Timothy is the poorest forage crop I know of. I have no use for it.

Mr. A. P. McKinstrey — My silo is wood. It is made with two air-spaces. If I was going to make another, I wouldn't make but one. My silo is 42 feet by 16 wide, and 13 feet high, on the north side of my barn so that I can take it out directly into the barn. My door is simply a hole in the barn, and I laid some loose boards across there, and tarred paper. When I wanted to open it I simply took an ax, and opened those boards. I have not got any roof that will shed water on it. The thermometer has gone down to 40° several times, but it has not frozen. I make my follower do all the protecting that is necessary. I built the silo so that I could put five feet more on top of it, but I think now, I will put four more below it, instead of on top, and I think I will protect the roof a little better. I think most of people cut their corn before it is matured, before the milk is in the ear. There is no question of its cheapness, I won't argue that. We started in this winter with twenty tons of hay, and we have got half of it yet, and I think we will have some left in the spring.

Question — How do you cover your silo?

Mr. McKinstrey — I cover by first taking four planks the length of my silo, and laying it right on. I left it open four or five days after we got all through filling it. We were

about four weeks putting in 170 tons; and we only worked six or seven hours a day. If we wanted to go to the fair, we went to the fair, and let her rip. We took four plank and laid them across our silo, and then laid a layer of boards the other way of the plank, leaving these plank as sort of stringers, then a layer of tarred paper, and another layer of boards on there, will make it as near air tight as we could. Then I took about 25 to 40 pounds of stone and laid them on that floor. Then I went to my ice house, I wanted to get the saw-dust out before it froze, to get it out of the way, and I put on six inches of saw-dust, covering the stone all up, and then I charged the boys to go up there every day, and tramp around that follower. It was all the time settling, and every time it will leave a crack at the follower, and it has got to be attended to just as much as a crop of ice needs attending to in the months of April and May; or any time in the first four weeks, you will see the steam coming up around that follower.

Question — What did it cost you to put it in?

Mr. McKinstrey. It cost me a dollar, and it cost me $200 to build the silo.

Question — What did you charge your land, in making it cost you $1.00 a ton?

Answer — I won't be sure, but I think $7.00. I think it cost us fifty cents a ton to put it in. I bought a one-horse tread power, and a No. 1 feed cutter, and I think the whole cost me, freight and all, $140. Unless they have a double wall I do not think you can keep the frost out of any kind of masonry.

Mr. Hoard — I visited a quite a number of silos a few weeks ago, and I found that several of them were partitioned off, with dead air spaces in the partition, filled with brick. Of course the location and the cheapness of material has got to decide that question. On the prairies, of course stone costs money.

Question — Should the partitions be necessarily air-tight?

Mr. McKinstrey — No, sir; I simply nailed 2x4s against the sides of the silo, and dropped these boards down in, and

when I wanted them out, I would just take an ax, and cut them out.

Mr. Curtis — I have a stone silo, the outer wall is two feet thick, about four feet above the ground, and seven feet below the ground. I have not discovered any frost on the ensilage at all. I took out what might be termed the floor over the cellar, and filled it right into the cellar, about eleven feet deep, and it settled about two feet. I put in three acres and calculated it was about seventy-five tons, according to the figures of Mr. Gould. We fed twice a day, last winter from that, thirty-four head of cattle, from the middle of November, until the first of February, when it was all fed out.

Mr. Gould — What was the effect when you stopped feeding the ensilage, and went to feeding hay?

Mr. Curtis — It was discouraging, the milk fell off quite a little, and the yield of butter also.

SHALL WE BUILD A SILO?

BY H. S. WEEKS, OCONOMOWOC, WIS.

HOW TO BUILD.

"Shall we build a silo?" This is the question propounded in your programme for this afternoon's discussion, and it seems to be the great question of the hour for farmers and dairymen all over this broad land, and the logic of facts is dictating an affirmative answer wherever light is thrown upon the subject and its merits become thoroughly understood. The question is then changed to, "*How* shall we build a silo?" I have been made aware of the new interest engendered in this particular question of ensilage, by the number of letters of inquiry I am receiving and the frequent calls to personally inspect my silos and hear from my own lips the wondrous tale of its merits, mine having been among the earliest built in the northwest, and therefore perhaps looked upon as having less of the experimental character than those of more recent construction. Some

who come have been *almost*, but not *altogether*, converted by what they have heard, but want a few more "cold facts" from actual experience to clinch the nails driven at the institutes. They want to see with their own eyes the cattle fed for years on ensilage, and be assured that it is a fact that I raise enough on sixteen acres of land to winter by this method upwards of forty head, and they are willing to a man to admit that the cows don't look as though they had been quartered on the weather side of a straw stack and fed with an occasional armful of dry uncut cornstalks, the woody fibre of which would make better fuel for the stove than for a cow's system. To be sure, they are "little Jerseys" that don't require much feed, a fact which I in turn am most willing to admit. Finally, they want to see the silos, learn all about their construction, capacity, mode of filling, etc. And this brings me to that portion of the subject to which I have in the wisdom of the superintendent been assigned to say something to you, viz.: "How to Build a Silo." Far be it for me to question his judgment, but never having built one, it would seem as though someone else could better impart the information. I can, however, tell you how mine are built, and in a general way, what is required. It is a question though to answer which correctly, one should know the location, surroundings and requirements of each builder.

My two silos each 30 feet long, 12 feet wide and 14 feet deep, are built in a side hill, the upper wall against the bank being of stone, 18 inches thick, and the balance of concrete, finished with cement, and bottom also of same. Imbedded in the top of each wall are plates of 2x12 plank, on which rests a balloon frame carrying the structure up five feet to the eaves of a peaked shingled roof, over all. These extension walls are boarded inside and out, and have tarred paper underneath, and are for the purpose of allowing the silos to be filled higher than the masonry before settling, also for head room. The cow stables adjoin the silos, the stock standing in the lower story, the yard being on a level with the floor, and the bottom of silos four feet below. We fill through doors in the side on a level with the high ground above, and feed out at the ends below, having doors one

above the other, as in an ice-house, opening into the stable. These silos are substantial and convenient, and when built six years ago, it was deemed essential that they should be wholly or partially underground, according to the custom adopted from foreign countries, where the system originated. Since then, however, the American farmer, with characteristic originality and inventiveness, has worked out for himself plans and arrangements in building silos, planting, cutting, filling, and feeding, suited to his individual requirements and means. A costly building and plans is no longer a necessity, and ensilage is within the compass of almost any one.

An *air tight* receptacle for green cut fodder, constitutes a silo, whether of stone, concrete or wood, and we build them to preserve the fodder just as we seal up fruit in air tight jars and cans. A silo may be cheaply built in the bay of a barn. If of stone, plaster with cement and make your partitions with double walls, of matched stuff with tarred paper underneath, floor of same or of concrete. A detached frame building may be built in the same way and placed where most convenient to feed out. It must be borne in mind that the lateral pressure of ensilage, when the silo is filled and weighted, is very great, and a frame building should be thoroughly strengthened with iron rods running through, otherwise it may spread and cause much trouble. Where the building is entirely above ground, doors should be from top to bottom, as in an ice house, and boards fitted with tarred paper back of them for the inside openings, to put in as filled. I think it well to tack tarred paper between the studding in the centre, which makes two dead air spaces and helps render it frost proof, and for that matter walls of masonry are the better for being double. I am frequently asked if the ensilage does not freeze in my silos, to which I answer, not to any serious extent, but when the weather is very severe it freezes to the outside wall on the exposed side more or less. The loss is, however, not great, and could be prevented entirely by a double wall of wood lining of inch boards and tarred paper. I have seen articles published recommending many divisions in the silo for the purpose of

filling sections at different times, and with different kinds of fodder, and also in order to empty one section at a time and not expose too much surface to the air. It occurs to me there are objections to this plan, as well as reasons in its favor. It is desirable to have at least two divisions, so as to fill first in one and then in the other, allowing time for the fodder to heat between fillings.

It is well to have a tarpaulin large enough to cover the surface exposed, and thus to some extent protect from the air. In regard to the proper size to build a silo to feed a given number of cattle, I do not find that there is any exact data to go upon. Mr. Bailey, of Massachusetts, who I believe built the first silo in this country, estimates that his silo, 30 feet long, 12 feet wide and 12 feet deep, held about 87 tons, which he thought enough to winter 12 to 15 cows, but his ensilage was of the primitive kind, cut when very green and full of water, and consequently heavier than the ideal ensilage of to-day, cut when the ears are in the roasting condition, the juices concentrated and the stalk comparatively dry. It would be impossible to get the same weight into a silo, but on the other hand feeding value is so much greater, that a correspondingly smaller quantity is necessary, hence the amount of space required would be about the same, or as Mr. Bailey estimates, say about 275 cubic feet to feed a cow six months.

In conclusion, let me offer you the experience of six years, father and son, in the use of the silos, at Oakwood farm, during which period no failure of complete success in the growing, curing and keeping of the crop has occurred, the past season of phenominal drouth proving on the whole, the best of the six for perfecting the ensilage to the point of most value for feeding purposes. The small crop goes further than any full one has before done. If there is nothing in this to convince you that there can be but one sensible answer to the question, "Shall we build a silo?" then indeed is the adage true, "None so blind as those that won't see."

HOW TO PLANT.

Geo. A. Austin, Neillsville, Wis. — I can not plant it till I plow the ground. I plow the land three to four inches deep; clover sod will do to plant four inches deep. Thoroughly fertilize and grind with disk harrow, acme or spring tooth harrow. I don't know but you might, but I can not afford to pay or board a man to use a common drag on any field of mine, except it is the eighty-tooth harrow in cultivating corn. Make the seed bed perfect, have no lumps. Plant in rows three feet ten inches apart, one to one and one-half inches deep, put the kernels from five to seven inches apart in the row. Bear in mind that the object of a stalk of corn is to mature an ear, and if you deprive it of that object it has nothing to do, and consequently it won't do anything. You must decide for yourself the fertility of your soil, its peculiar location and determine how far apart to plant the corn. It wants to be planted just as thick as it can be planted and each stalk mature favorably. Plant early in the spring, as the weather will permit, and as the ground can be prepared in good condition. Keep the drag in that corn, and never let the weeds start; it is cheaper to kill weeds before they put in an appearance than it is afterwards. You want to drag two or three times until the corn is up; then, as long as you can drag it, once a week; then, by going through once or twice with your cultivator it will take care of itself. Plant the Southern Georgia ensilage sweet corn, that has been demonstrated a good thing. Plant as an experiment some of your own corn, and see which is the best.

FILLING.

John Gould, Aurora, Ohio — The question of filling the silo is most important. We started out with the impression that we must fill as rapidly as possible to get it away from the air. Now we have found out that the farmer can take more time and get twice as many tons in. So we take and cut the corn with a reaper. Take a row at a time and load it on to low wheeled trucks with platforms on. Take one of those gavels that is left by the machine, walk up an

inclined board and take it to the cutter. The cutter is supposed to be put over the partition between the two pits, so that to-day we can put a certain amount in this pit, and to-morrow in the other. Now, what is the result? We fill this pit, to-morrow the temperature has risen to 120 degrees, the cooking degree. We have got to preserve the corn fodder, as the lady does her preserves. Fill this pit to-day, and this to-morrow. By the old plan it would settle one-half, and we must put on as many tons of stone upon the covers as we had tons of ensilage under the cover. Now, by the slow filling, and the heating and the settling we get the silo full, the air has been excluded from it, and it is warmed up, and all we need to do is to put a cover on to it, which will keep the air out. We simply cover with tarred paper, well lapped, and lay a load of hay on top, and our silo is covered. When we get ready to feed, we throw the cover off the pit and feed off the top and we have got sweet ensilage.

HOW TO FEED.

Hon. Hiram Smith, Sheboygan Falls, Wis.— In the first place I wish to announce that I have only had one year's experience. A professor of agriculture wants from two to three and eight years in order to determine the utility of an experiment.

About a year ago I decided to build a silo, and built it so as to hold near three hundred tons, thinking it would last me through the winter, and it would do so, but I would say here that I do not feed milch cows, I run a winter dairy as some of you may know. I do not feed but twenty-five pounds of that ensilage to each cow per day in two feeds, about equally divided, putting upon that two pounds of bran and two pounds of corn meal or barley meal or oats, or other mixed ground feed, making four pounds of ground feed at each feed, in total twenty-five pounds of ensilage, eight pounds of ground feed and eight pounds of hay to a cow of about 1,000 pounds weight. To a Jersey cow, I give about twenty pounds of ensilage, three pounds of hay, and seven or eight pounds of ground feed. They are cows all in milk. And I have found, to my satisfaction, that the butter is

equally as good as any I ever made in June. It churns about like grass cream, has the appearance of it. The flavor of the butter has been materially improved, and I can account for it in no other way than by the ensilage feed.

I will say that in my opinion from the little experience that I have had, that the older corn made the sweeter ensilage, more nutritious, and another year I shall plant two kinds of corn, one of the earlier variety which I can commence to cut about two weeks earlier than the B. and W. corn. I want to study out the question more thoroughly. There will be a little acidity in it, but it is not unpleasant to the cow. I think I never fed any kind of roughage that the cows relished better than they do ensilage feed. If I throw ensilage before them with the best hay, they immediately buck away the hay with the nose, and will not touch it until all the ensilage food has been consumed, proving that the cow's judgment is, that it is good food for her.

The ensilage feed has been heated up to 120 degrees during the filling process, it is partially cooked, and is succulent. It is easily digested, and there is not a particle of waste about a crop if it is properly tread down in the corners and along the edges. I am entirely satisfied with it, and I believe I shall be borne out by anybody who has fed it for winter dairying. It improves the flavor and the color of the butter. It is equally good for the production of beef, and our butchers say that the beef is as good and juicy as grass fed beef. I have no doubt that this is the only method by which the production of beef can be made profitable in Wisconsin. For those who have tried it it is equally valuable for a soiling food when land becomes worth $80 or $90 an acre. There is no sort of return for the investment in such land to pasture cows or any other animal upon. Neither can a man on such valuable land afford to winter his cows on hay. It costs too much money. Therefore we must provide a cheaper food in order to compete with the low prices which we now have and are likely to have for a number of years. The silo has come to our relief. The first experiments in that direction were very expensive, but we have found out that if we only keep the air out, all the old ex-

pensive methods were unnecessary and a building of a silo is perfectly practicable for every farmer in the state.

THE RESULTS OF FEEDING ENSILAGE.

BY AUG. SHULTZ, LAKE MILLS, WISCONSIN.

I built my silo in August, 1886. It is 20x14 feet, eight feet in the ground and eight feet above, total height sixteen feet. The wall in the ground is laid up with stone; above ground, of wood laid with brick between the studding. There is no partition in the silo. It is plastered on the inside, my idea being to build it like a cistern in character.

I plowed four acres of the W. & B. ensilage corn and four acres of the "Sweet Dent" variety, the seed of which I obtained in Chicago. The corn was planted in June — a mistake, shall plant next spring as early as possible — on clover sod turned last fall.

I commenced filling silo October 1st, cut the stalks in the field by hand, let it lie one day and wilt, then commenced cutting it into the silo. I cut twelve tons a day, then omitted one day until the heat arose to 130°, then resumed, and so on until the whole was cut, amounting to seventy-two tons on eight acres. The silo was then covered in the usual way, weighted with five cords of wood.

I opened the silo about Christmas and found the silage in fine condition. My neighbors all laughed at me, they were so smart you know. They told me that they would have to make a bee in the spring and help me draw out my big box of manure. When I had been feeding it some time I called in some of my neighbors and stationed them in the barn so they could see the cattle come in to get their feed of silage. The cattle came in so fast and anxious as to make my sceptical friends jump to get out of the way, which of course was fun for me after what they had said.

My stock of cattle consists of twenty-three cows, twelve two year old heifers coming in, and fourteen year old heifers. These are full blood Holsteins, grade Holsteins, and a few Short Horn grades.

The cows get twenty-five pounds each day, and the young cattle fifteen pounds. Besides this, they are fed: Cows ten pounds of dry cut corn stalks and young cattle proportionately of the same, and all are fed at night a feed of fair marsh hay. The cows are fed besides four quarts of bran each a day; the young stock none.

The effect on my cattle may be stated thus: For the first time in my life I have been enabled to save all the old hair of my animals to go into the manure before they were turned to grass. Heretofore they have waited until grass feed and so the hair blew over into my neighbor's fields, and I couldn't save it. I fed two grade Short Horn three year old heifers, all they would eat of it, with a view of fattening them. In addition I fed each heifer one barrel of corn meal. The time of feeding was two months. One heifer weighed 1,100 pounds, the other 1,000 pounds when put up. When sold at the end of the sixty days, the first weighed 1,305 pounds; the other 1,250 pounds. All this time I was milking the heifers and they were not dry when I sold them for beef, at 3½ cents a pound, live weight.

From all I can gather, I consider my silo a wonderful help to me. When I commenced feeding silage to my cows, who were strippers, I was getting four cans of milk a day. In two weeks the yield had increased to five cans. My cattle seemed to hold up their flesh better than ever. They do not stand round in the yard, all four legs in one hole.

I fed it to my horses two weeks for a trial, 15 pounds a day I noticed it made their hair look very much better. I also fed it to hogs and they ate it greedily.

My silo cost me about $85, using the roof of an old wagon shed.

I am convinced that no farmer who has a decent amount of farm stock of any kind to handle, can afford to go on in the old way of wintering his cattle. But to the dairyman who will reject this method of saving the cost in the production of milk and butter or cheese, I can only say, he doesn't want the full reward of his time and labor as badly as I do.

BUTTER MAKING AND FEEDING ENSILAGE.

BY F. C. CURTIS, ROCKY RUN, WIS.

Last season I raised five acres of the large southern corn known as the Burrall & Whitman ensilage corn.

Being somewhat skeptical about the results of preserving the same in the silo, I concluded to follow the advice of Superintendent Morrison "to go slow," hence, I brought into requisition a part of my barn which was of solid masonry, for a silo, and ensilaged only three of the five acres of corn all of which was done, as near as I could remember, in accordance with the directions of Mr. Gould at the institutes last season. It will be well here to note that Mr. Gould spoke disparagingly of the stone silos, that this silo was about 12x24, and about fourteen feet deep, being just about the space required to hold the three acres, and according to Mr. Gould's arithmetic, I computed the ensilaged corn to be about eighty tons in round numbers — as it settled about two feet, we will call it seventy-five tons.

The 10th of November we commenced feeding this ensilage twice a day to thirty-four head of cattle, about twenty of which were milch cows and the balance were young stock, all stabled in the same building. While the weather was pleasant and not uncomfortably cold, the cattle were allowed the range of the pastures, but when the weather was cold or unpleasant, they were kept in the stable except about an hour for watering each day, and when kept in the stable they had a feed of hay at noon.

Their allowance of ensilage was a well heaped one, and one-half bushel basket divided between two head of stock, and the milch cows had in addition five quarts each of dry wheat bran, twice a day.

Upon stripping the ensilage for feeding, I found it damaged a little at the sides and corners caused, of course, by the air getting in, and possibly by a want of packing in the corners, and also from the fact, that the masonry of the walls, although very true and well made, were not strictly

smooth, and the board covering did not slide down evenly with the settling ensilage.

The half rotten, mouldy, and damaged ensilage, was thrown out as waste, and was mainly consumed by the outside stock.

At the bottom of the silo I found about one foot of the ensilage was quite acid, and yet it was greedily eaten by the stock. The ensilage lasted until the forepart of February, feeding thirty-four head of stock as stated, and fully to my satisfaction.

The cows when put upon it, increased in their milk yield, and in the quality and quantity of butter made from them, also in their general thriving appearance.

I design to put in ten acres of this ensilage corn the coming season, and preserve it all in the silo, instead of five acres as last year, only three of which was ensilaged.

In reflecting upon the teachings and observations of many years, I have come to the conclusion that the principle involved in the ensilage question is not as new as generally supposed, but that it is simply a step in advance of the teachings of Mr. Stephen Favill and others in preserving clover and forage for stock. In examining into this subject, we find that herbs and grasses, when matured to a certain stage of growth is a beautiful pea-green color — if left to mature further, it loses this green — if severed from its stalk and dried in the sun and light, it also loses its green or becomes less green in a short time, and if retained in the sun or strong light it looses its green altogether.

On the other hand if cut when in the green stage and dried in a dark place it will be found to retain its beautiful green color for a long time if kept from the light, but if exposed to the light, this green will soon vanish.

These reflections bring me to the conclusion that the silo when fully understood will prove to be a perfect preserving power for the preservation of all material desired to be placed therein.

DISCUSSION.

Question — How do you get your corn stalks from the low trucks to the cutters on top of the silo?

Mr. Gould — We don't put the cutter on top of the silo; it is put on the ground at the level of the top of the trucks. A carrier carries the fodder from the cutters over to the silo. The man that takes it off the truck, puts it on the cutters. There is only one lifting of the fodder.

Question — How much shrinkage in weight is there from the green fodder put into the silo?

Mr. Gould — In Ohio, last year, it was almost universally left on the ground twenty-four hours to wilt. It has been estimated that there is about ten per cent. evaporation after that:

Question — What is the length for cutting?

Answer — One inch. Fill your silo full and it won't shrink more than ten to fifteen inches. We put on the cover as soon as the top layer is warmed up.

Question — Why would not a silo of circular form, without corners, be preferable?

Mr. Gould — Simply because of the waste of room.

Mr. Weeks — The corners of my silos are in an octagon shape, a very small corner cut off, and it treads down a little better than square corners.

Question — Mr. Smith, what has been your success in filling a silo with clover hay?

Mr. Hiram Smith — Two years ago I put my second crop of clover in the silo. That does not require cutting. You merely mow it in the forenoon, in the afternoon pick it up from the swarth, put in on the wagon, and the horse fork will take it off and drop it into the silo, and it is spread around evenly just the same as the corn. It is the best and cheapest way to take care of the second crop of clover. You get all the value there is in it. When you fill the silo silo you let the temperature raise to 120° and then refill.

Question — What is the comparative value of clover and corn ensilage?

Mr. Smith — I don't know and don't like to guess; but we know from the nature of the plant that it is much more nutritious than corn, ton for ton, but not acre for acre.

Question What does the gentleman fill his silo with that keeps forty head of cattle on sixteen acres of land?

Answer — Southern ensilage corn.

Question — No clover at all?

Answer — No, sir; none at all.

Would you recommend the feeding of this ensilage to your horses.

Answer — I have tried it, and found it very satisfactory.

Question — What do you feed in the summer time.

Mr. Smith — Feed pasture and grass and ensilage and keep twice as many as we used to.

Pres. Morrison — I met Mr. Putnam, living in Dodge county, last winter, and he said that he had read a great deal about silos, and he went to work, and erected one, and he was very much like Thomas Jefferson, in putting up a saw mill on top of a mountain, he had no ensilage to put into his silo, and he went into his dent corn field which was sufficiently matured to harvest, and he run it through his cutter, and put it into the silo, and he said afterwards, "If I didn't know that was put in last fall, I would swear it was put in yesterday." It was perfect, and he was feeding not only his cows but his horses, sheep and hogs. Now, many of you will go home from this convention, and commence your experimental work. I shall put up a silo the coming summer, I shall send to Mr. Curtis and get some of the southern sweet corn, and I shall take some of our ordinary yellow dent corn, and try that. I shall have one compartment of each kind.

Ensilage has already become an important factor in gathering and saving for use the product of the farm, and I believe the time is not far distant, when by this system, the fodder product of our farms may be doubled, and the value of our lands for keeping dairy cows. Yes, all our domestic animals, and fattening them too, correspondingly increased.

No subject at our farm institutes this winter, creates the enthusiasm and charm the attention of the farmers so thoroughly, and I think over 500 silos will be built in Wisconsin the coming season.

It is unnecessary to longer dwell or take more time of this convention, on the advantages of a system of curing a ration which shall place us independent of the weather, and which will enable us to double the feeding capacity of our farms. Try the ensilage corn and put up a small silo, and if another drouth like the one the past summer should shorten our hay crop, you will thank the members of this Association for dwelling and impressing this subject upon your attention.

Music — Male Quartette.

DISCUSSION.

Prof. Henry — *Mr. Chairman, Ladies and Gentlemen:* A portion of this audience heard my remarks yesterday. I find that I left an incorrect impression in regard to some things, which I wish to correct. The main point was this. In regard to Indian corn. I claim that Indian corn in this north western country, is the grandest crop we grow. I claim that corn itself is one of the most wonderful foods we have upon the farm. Now, it seems that some people thought I was talking against corn yesterday, as though corn was the cause of hog cholera. It is simply the excess of corn feeding that is the trouble. A farmer has 500 or 1,000 bushels of corn in his crib in the fall, and will use it to excess, simply because he has it on hand. In mixing a perfect ration, corn is naturally a feature to introduce, but owing to our location being near Minneapolis, bran and shorts are very essential, because we can by them cheaply. They are going up gradually in price, but still we can get them below what they are worth compared with the prices of other food articles. If a mason is talking with a brother mason he may talk about bricks, and perhaps not so much about mortar, but a good mason will use the proper amount

of mortar and the proper amount of brick in making a wall. Just because there is a big pile of brick handy, he does not put brick alone into a wall. Our farmers sometimes, because they have a lot of corn, will pile it into the calves and hogs this year, and next year when it is scarce and high, they won't give them enough. We must study this subject. The milch cow must get about 2½ pounds of protein, and 12½ of carbhydrates, properly mixed, just as you mix the bricks and mortar in the wall, in order to give a good flow of milk.

Then another thing. It seems I gave you to infer that bran was the best feed for pigs in the line of protein feed. Now, bran seems to be better adapted to the stomach of the cow than the pig, so in general I should feed shorts to the pig, which furnishes the protein and let the bran go to the cow. Ground oats are the finest feed we have on the farm, but the most expensive, and the farmer can better sell the oats and buy bran. Sweet skim milk is all right. It is rich in protein, and with some corn and shorts, you have a very fine ration.

Mr. Boyd — You did not propose to feed corn meal clear, to the cow?

Prof. Henry — No, sir. For an ordinary pig I would mix about half corn meal and half shorts. For a dairy cow, I would mix two-thirds bran, and one-third corn meal.

Mr. Boyd — It is my experience that if I feed corn meal my cows dry up. I don't think corn meal is a fit ration for a dairy cow.

Prof. Henry — You see that I am assuming that our farmers are feeding coarse feed. You may be feeding so much carbhydrates that the corn meal don't show.

Mr. Boyd — I can not get as much milk and butter from corn meal as I can from oats.

Prof. Henry — I don't doubt that. Oats are a fine feed but too expensive. You would perhaps do better to feed an army on porterhouse steak, than any other meat, and the army would like it, but it would be pretty expensive.

REPORT OF COMMITTEE ON RESOLUTIONS.

Presented and adopted.

WHEREAS, There are many problems in agriculture now confronting the farmer, which he is unable to solve from lack of time and facilities for careful investigation, and

WHEREAS, Experiment stations have in a small way shown us already that they are the places for such problems to be solved, and that from them we can gain information of the highest value in advanced agriculture, therefore,

Resolved, That we appreciate most highly the recent action of the United States Senate in passing so unanimously a bill to create experiment stations in the several states of the union, and to provide for the liberal maintenance thereof, and we urge upon our Wisconsin members of the House of Representatives to labor by all honorable means for the early passage of said bill.

Resolved, That the secretary of this association is hereby instructed to furnish a copy of the above resolution to each of our members in Congress at his earliest convenience.

Resolved, That the thanks of this Association are due to President W. H. Morrison, and D. W. Curtis, the Secretary, for their efficient services.

Resolved, That the sincere thanks of this association are tendered to the citizens of Sparta for their generous hospitality, and their well appointed banquet, that will long linger a pleasant memory with the guests.

Resolved, That the thanks of the visiting members of this association are tendered to the different railways of Wisconsin, for providing reduced fare to those in attendance.

Resolved, That this association ask of the legislature a law with proper police authority, to prevent the manufacture and sale of any form of adulterated cheese, for the pure article. That any adulterated cheese shall be branded and sold for what it is. That any violation of this law shall incur a penalty of not less than $100 for the first offense. There must be a suppression of the practice of adulteration of cheese or the cheese industry of Wisconsin will suffer almost irreparable loss.

Resolved, That we recognize in the Farmers' Institute, one of the best means ever devised, in this or any other state, for bringing farmers together for the proper discussion of subjects effecting their interest as tillers of the soil. We therefore, as associated dairymen, earnestly request the members of our present legislature to favorably consider the bill asking for an appropriation to continue this most important work in bringing a knowledge of improved methods of produce to the farmers of our state.

Resolved, That the officers of this association are requested to provide

at the next meeting, a certain amount of experimental work in the testing of milk, and the manipulating of the same as an object lesson in the making of butter and cheese.

Resolved, That in view of the powerful influence exerted by this association in the development of the agricultural wealth of the state, by promoting the spread of dairy knowledge among the people, this convention respectfully petitions the legislature now in session, to appropriate the sum of $2,000 to this association for the purpose of sustaining the large expense of its annual convention, and such other effort as may be deemed practicable for the better promotion of our dairy interests.

Resolved, That the hearty thanks of this association is hereby tendered to all those ladies and gentlemen who by essay and address before this convention have so materially contributed to the instruction, pleasure and profit of all concerned.

Resolved, That this association is decidedly opposed to any effort emanating from whatever source it may, that has for its object any modification of the present law of congress concerning oleomargarine, looking to a modification of the license fees or a reduction of the tax. We believe the law wise and just and it should be made stronger, not weaker.

W. D. HOARD,
R. P. McGLINCY,
JOHN GOULD,
Committee on Resolutions.

Mr. Hoard — The committee desire to express in a peculiar form by a separate motion, their appreciation of the most beautiful music rendered by both the Ladies' and Gentlemen's quartettes of this city for our entertainment while here, and I move, sir, that a unanimous vote of thanks be tendered to these ladies and gentlemen for the very excellent music that they have given us, during our convention, and that the same be put upon record.

Motion seconded, and unanimously adopted by a rising vote.

Music — Ladies' Quartette.

REPORT OF COMMITTEE ON DAIRY IMPLEMENTS.

Presented and adopted.

Your committee on dairy implements, would respectfully report that they find on exhibition, as follows:

By F. B. Fargo & Co., Lake Mills, Wis., dairy supply house.

Their butter color and cheese color. Prof. Arnold's cheese color and rennet extract, and a general line of dairy supplies.

By Gennesee Salt Co., Pifford, N. Y. F. A. Tripp, Manager.

Samples of the Gennesee butter and cheese salt. American salt made by the English process.

By Charles Hansen. John H. Monrad, Manager.

The Hansen butter color, the Hansen cheese color, rennet extract and tablets, also household tablets for family use.

By John Boyd, 119 Lake street, Chicago.

Has his usual display of the Cooley creamer, and Cooley cans.

By Mast, Foss & Co., Springfield, Ohio.

The Buck-eye Force Pump, and the Iron Turbin Wind Engine.

We believe all the articles on exhibition, are first-class, and the houses are reliable.

H B. GINLER,
H. Z. FISH,
GEO. A. AUSTIN,
Committee.

REPORT OF COMMITTEE ON BUTTER AND CHEESE.

Your committee on butter and cheese beg leave to submit the following report:

CLASS 1—PREMIUMS IN BUTTER.

H. Z. Fish, Richland Center, first premium	$10 00
N. E. Allen, Beaver Dam, second premium	5 00

CLASS 2—PRINT BUTTER.

H. Z. Fish, Richland Center, first premium	$5 00
Miss Nellie E. Smith, Sparta, second premium	3 00

CLASS 3 — GRANULATED BUTTER.

H. Z. Fish, Richland Center, first premium..... $3 00
F. B. Fargo, Lake Mills, second premium..... 2 00

CLASS 4 — CHEESE.

Burns Cheese Association, Burns, first premium..... $10 00
H. Z. Fish, Richland Center, second premium..... 5 00

CLASS 5 — HART SILVER CUP.

Burns Cheese Association, Burns.

It has been won by A. H. Wheaton, Auroraville, 1878; Olin & Clinton, Waukesha, 1879; W. S. Baker, Cold Spring, 1880; H. A. Congar & Son, Whitewater, 1881; August Klessing, Centreville, 1882; Marr & Dyer, Whitewater, 1883; E. P. Ingalls, Milford, 1884; H. Z. Fish, Richland Center, 1885; T. P. Fish, Richland Center, 1886, and Burns Cheese Association, Burns, 1887.

Respectfully submitted,

C. F. DEXTER,
C. H. POTTER,
C. HAZEN,
Committee.

REPORT OF COMMITTEE ON NOMINATIONS.

Your committee charged with the duty of making a nomination for the officials of this association for the ensuing year, which nominations you can confirm or reject by a vote of yourselves as you may deem the suggestions we make fitting or otherwise, beg leave to report for your consideration as follows:

For President, Hon. H. C. Adams.
For Secretary, D. W. Curtis.
For Treasurer, H. K. Loomis.

In suggesting a change at the head of the ticket when it is well known that the gentleman who presides now has given far more than satisfaction to the dairymen of the state who called him to the front, and who is so well able to serve us still, your committee is aware that it is under obligation to give strong and sufficient reasons therefor.

At first thought it seems like a mistake to do so, and we had a half-made report that recited that the re-election of all the incumbents was desired, because it was a case in which the best rules of civil service would apply with great force, as we could all say: "Well done, good and faithful servants, keep right on." We should have let that

determination stand, but for the importunity of Mr. Morrison himself, who we are just as confident has the good of the dairymen and farmers, and the educational forces of the state fully as much at heart in retiring as he has ever shown he had in administering efficiently the office of President he now occupies. His position as supterintendent of farmers' institutes, that is a larger interest, but not of better quality than the great dairy interest, calls for almost every hour of his time, and we should be warned, as well as he should warn himself, that over work is almost as heinous a sin on the part of those who are really good for something, as the under rush of those who ought to feel the spur.

Other reasons: By the constitution of our Society the Executive Board is made up of the current acting officials and the ex-presidents of the Association. So it will be seen that we can only add to the board by electing from time to time a new president. A kind providence has been indulgent, and so far has made the holding of the office of president of the Association as good as a life insurance, in one respect, as not one who has ever held the post during the last fifteen years has been called hence for higher rewards. But we can all see the "snows that never melt" are fast settling upon their honored heads, and they remind us that ere long in the natural order of things, the serried rank will be broken by death. So it is well to infuse new blood into the body, that we all trust will be doing good business at the old stand forever and forever.

In substituting H. C. Adams, for W. H. Morrison, your committee feels that it knows it is not making a poor trade. It is like exchanging one ten thousand dollar bond for another ten thousand dollar bond, and the keeping of both of them, for while we get one of the brightest and best, (who would be with us now but for sickness in his family). We also retain upon our board the man, tried and reliable, who will never shirk a duty where the interests of the dairy are concerned.

As to the other officials whom we nominate, their harness is on; they never balk and being suited with the team. So far as your case is concerned, they are not open for a trade.

All of which is respectfully submitted.

CHAS. R. BEACH,
STEPHEN FAVILLE,
J. A. SMITH,
Committee.

Pres. Morrison — I most heartily endorse the report of the committee. After serving four years, I find that in my institute work, I shall have to spare myself in the future, and I know of no better man in the state than H. C. Adams to assume the duties of president of your association.

HOW I CONSTRUCTED A PERMANENT PASTURE.

BY JOHN BOYD, ELMHURST, ILL.

When your worthy secretary, Mr. Curtis, assigned this subject to me, he wrote a very peremptory note, saying, "You must write a short article on 'permanent pastures,' there is no use of saying you won't, as we have decided you shall." Had he consulted me, I would have suggested that the title be, "How I Would Construct a Permanent Pasture," not "How I Did."

It is a weakness of human nature to be fond of letting others know of our successes; very few are willing to admit their failures.

Many a time in listening to your debates, it has occurred to me that if we only had courage enough to tell each other of our failures, when, where and how we made them, more good would result, twice over, than any one of us will now fully credit.

When I commenced farming some twelve years ago, I had no practical experience whatever with farm work, but my ambition ran high to make a successful farmer, although I could not devote my entire time to the work, of course my mistakes have been numerous, but I do not yet despair.

One of the first things that attracted my attention on my farm and those of my neighbors', was the poverty of the pastures; they were composed mainly of native prairie, blue grass and white clover, the two latter having seeded themselves without any effort on the part of the owners. These grasses did not start to grow very early in the spring, and by the 20th of July were practically no longer of any great value as pasturage for that season, with the exception of a short time in the fall, provided rains were plentiful.

It didn't take me very long to find out that such pastures were not very profitable on land worth $100 per acre, and that I must either have a better pasture or turn my attention to soiling; with these alternatives before my eyes I visited a farm of forty acres, that was then supporting

forty milch cows the year round, by the soiling system. The filth of the yards in which the cows exercised was so great, that I came home determined to try and improve my pasture first, rather than resort to soiling.

It would perhaps be well for me to tell you first, what kind of pastures we had in our neighborhood, we have some of them yet, by the way, some of you may recognize a familiar friend.

As I told you before they were composed of prairie grass, mixed by dame nature with blue grass and white clover, the land devoted to the purpose was the wettest and least valu able land on the farm and the pastures were never under any circumstances fertilized. At least from two to three acres were required to allow one cow a scanty living, much of the soil and its product sour, from the effects of too much water. And let me say right here, that it is as reasonable to expect figs from thistles, as it is to expect a cow to give rich milk or good butter and cheese from a sour pasture, wonderful as Mr. Hoard's special purpose cow may be, she is unequal to that task.

My next step was to find out what kind of a pasture was necessary, and I discovered that English pastures were considered about perfect, that they were composed of a great variety of grasses, maturing at different periods of the season, say, for instance, they had the very early grasses first, starting very early in the spring; as soon as these were eaten off their places were supplied by another crop of a later variety, and when these were disposed of, a still later variety took their places, in that way the pastures were kept green and flourishing from earliest spring to latest fall, yielding at all times an abundance of the richest food, and capable of sustaining from two to three cows per acre.

Upon this light I acted; had the land plowed and thoroughly pulverized, we sowed the seed, a mixture of some twenty different varieties, at the rate of two bushels per acre, and the next year we had our permanent pasture. The growth of grasses in that field was something surprising. From early spring to late in the fall, the field was one continuous mat of rich, bright green foliage, presenting a

strong contrast to the adjoining fields, in fact we were compelled to mow portions of this field several seasons, although stocked with cattle all the time carrying usually from one to two head per acre, sometimes more.

It is very essential for its preservation that a pasture of this kind should be cropped close, the closer the better, otherwise the coarser grasses will grow so fast and rank as to choke out many of the finer, sweeter, fatening sorts and thus materially injure the pasture in one season, and in two years ruin it almost beyond redemption.

I have heard farmers talk of leaving so much grass to grow up and shade the ground, also rot and manure the ground. With all due respect to other people's opinions, this the most absurd nonsense imaginable. As well might a man encourage a quantity of trees to grow up and shade his corn.

The question of feeding comes in here so pat that I must just refer to it. All observing feeders have learned that stock will thrive better and produce more on mixed rations than on any one kind. The same rule applies with equal, if not greater force, in grazing, hence the necessity for seeding with a variety of grasses.

A case in point came under my observation this last summer: A friend had two small pastures that he used for grazing seven head of Jersey cows, one lot composed of one variety of grass only, the other, of mixed grasses; the lots were equal in every respect otherwise, yet the seven cows fell off one pound of butter per day when changed from the pasture of mixed grasses to the other, and recovered the one pound when changed back to the mixed pasture. It is only fair to presume that the falling-off would have been very much greater had the grazing been continued on the pasture containing the one kind of grass.

The deterioration of grasses arises principally from two causes:

1st. The exhaustion of the specific food necessary for their existence, and the consequent introduction of mosses and valueless herbage.

2d. The existence of too much water in the soil.

The remedies are very simple:

For the first, fertilize; for the second, drain.

If these two important requisites are faithfully observed, your permanent pasture, properly made, will outlast a life-time, growing better and more valuable every year. It will be like old wine, of a superior vintage, as compared with vinegar and water.

For fertilizers, I have used as top-dressing, liquid manure, bone-meal and lime, land plaster, phosphate and kainit. Of these I have found to be the best, liquid manure, bone-meal and lime; of the kainit, however, I am not fully qualified to speak, having only used it this last year. From what I have seen of its effects, I believe it to be very valuable; salt and potash are its principal components. The liquid manure we collected in a large tank outside of the cow stable, and applied to the land by means of a watering cart.

The bone-meal we spread with a broad-cast seeder 200 pounds per acre (not enough). The lime (slacked) we applied forty to fifty bushels per acre.

This last is a cheap fertilizer of great value and easily obtained in almost any locality, it possesses the property of collecting the acid of the air and of forming a combination of great use in vegetation, it is valuable for sand or clay soils, upon clay soil the effect is to produce a mild fermentation, opening and dividing the soil and rendering the surface friable and retentive of moisture, it assists in decomposing the dry vegetable matter upon the surface, destroys the mosses and valueless herbage, and will astonish any one in its effects on sour grass lands. If you have any such land on your farms, and there are few farms without such land, try an application of 40 to 80 bushels per acre, and if it don't make you smile, it is because you are beyond the hope of reclamation.

Unless your wet land is under-drained, however, you must limit the quantity per acre to not over 40 bushels, there is danger of liming wet land too much. As a general thing there is no part of the farm gets that little care and attention as the pasture. I venture to say there are very few farmers

in this community who have ever thought of fertilizing their pastures as they do their corn fields or their potato patches, yet they expect as much or more of them, they rely almost exclusively on their pastures to carry their dairy herds one-half of the year, during the very time they are producing the bulk of their annual products. No wonder they are driven by sheer necessity to the questionable practice of soiling.

We must bear in mind that, although soiling may be fairly good, a perfect substitute for grass has not yet been discovered, the latter is nature's handiwork, and nothing can take its place, so far, it remains for us to cultivate it and improve it with all the light and intelligence we can muster.

The following formula for pernament pasture is taken from that excellent little work, Henderson's Hand Book of Grasses, and gives the number of pounds of each required for one acre of land, you must understand, however, that although some of these will grow on any soil, others may not be best adapted to your individual case and it is useless to sow varieties that will not flourish on your land.

GRASS SEEDS FOR ONE ACRE OF PERMANENT PASTURE.

		Pounds.
May and June.	Orchard grass	6
	Meadow fox-tail	2
	Meadow fiscue	2
April and May.	Sweet scented vernal	1
June and July.	Rough stalked meadow	2
	Timothy	3
	Fall oat grass	1
	Cristed dogstail	4
	Nerved meadow grass	2
	Wood meadow	2
	Fiorin	1
June.	Perennial rye grass	5
	Italian rye grass	5
	White clover	4
	Red clover	3
	Alsyke clover	1
	Yarrow	1
	Total in all	47

The quantity of seed here given per acre, 47 pounds, may seem to some of you excessive, if so, consider the fact that

the most productive natural pastures exhibit on an average seven plants to every square inch, light seeding is a snare of the worst kind.

My experience would suggest some slight changes. I would discard the Italian rye grass, the timothy, the white clover and the red clover, and double the quantity of orchard grass, sweet-scented vernal, the alsyke clover, fall oat grass, and add six pounds of Kentucky blue grass. I would discard the Italian rye as unsuited to our northern climate, the timothy as next to worthless for permanent pasture, and a very much over-rated grass for anything, the white clover as a nuisance, especially in permanent pasture, often doing irreparable damage in the winter by heaving entirely out of the ground and carrying death and destruction to its more valuable companions; in climates where this objection does not hold good, however, it is a valuable pasture grass, the red clover for the reason only, that it is not permanent. This may not be considered a sufficient reason, and would not be if we had not the alsyke clover to fall back on.

I would double the quantity of orchard grass seed believing it to be the most valuable grass for both pasture and meadow, raised in this country, too much can not be said in its praise. Orchard grass is a native to the manor born. It has always been a mystery to me why it should be so great a stranger to our farms. I have found it, in every respect, infinitely superior to timothy for dairy cattle. Were I obliged to make choice of two grasses and be deprived of all others, I would choose orchard grass and alsyke clover.

I would double the seeding of sweet-scented vernal, because it is not only hardy and permanent, but very early and fragrant, desirable for dairy cattle, producing fine flavor in milk and butter. Double the alsyke clover as the best of all clovers for permanent pasture or meadow, very productive, rich, durable, hardy, and for feed (green or dry) unequalled in sweetness, it will grow and flourish where no other clover can exist.

We made two mistakes in our permanent pasture that I have discovered and would earnestly warn you against, you have perhaps discovered them before this. The first

was in the selection of some of our seeds, and the second in not fertilizing sufficiently the pasture in its infancy. Young grass plants are like young pigs, calves and colts, they require more care and nourishment in their early growth than at any other period of their existence, once stunted they never fully recover, if they survive, one application of a suitable plant food is worth more to them the first year of their life than twice the quantity the second year, or three times the quantity the third year, one trial will be sufficient to convince any ordinary observer of this. Another fruitful cause of failure, is our neglect to return to the soil, that plant food which by our peculiar mode of farming we exhaust the most; for instance a pasture that supports a given number of milch cows requires different treatment from the one that supports an equal number of beef cattle, the droppings or manure from one is different from that of the other. It is my belief that to the exhaustion of the phosphates on dairy farms, more than to any other one cause may be attributed the much dreaded scourge of premature calving.

Insignificant as a blade of grass may seem in your eyes, it is the all-powerful lever that moves this great nation; it is not only the corner stone, but the entire foundation of the agricultural wealth of the state. The very best authority has it "all flesh is grass."

Very few farmers, I think, have a correct estimate of what a quantity of green food their pastures should, or do, furnish during a season; did they fully realize this they would give them more attention and fertilize them as religiously as they do their corn fields. Some estimate may be formed by reading Prof. Henry's report of soiling vs. pasturing, in the 3rd annual report of the Wisconsin Agricultural Experiment Station, in which he states that it required 118 lbs. of green food per cow per day. This green food was composed of green clover, green fodder corn, and green oats.

One can readily see by examining those figures that no ordinary pasture could sustain such a drain, yet I fully believe that a permanent pasture under favorable conditions,

well fertilized, is entirely capable of producing equally good, if not better results, besides having the great advantage of being far superior for breeding stock, if not for all kinds of animals. An excellent and profitable way of fertilizing my pastures I found by feeding bran, ground oats, and oil meal, twice a day during the summer.

Mr. President and Gentlemen, it is my firm conviction that the great question for the western farmer to solve, and it must be solved in the near future, is what to feed and how to feed, not so much how to raise crops; that will inevitably follow.

DAIRY TEMPERAMENT IN COWS.

BY W. D. HOARD, FORT ATKINSON, WIS.

I would like to talk to this audience a little while about several things that I believe would be useful to the owners of dairy cows. I would like to talk about some noted cows, whose pictures hang here on the walls; and I would like to trace with you, some of the features whereby these animals may be judged; but it is late, and I will merely answer a question asked yesterday. How can we judge a dairy cow? I will answer it by saying this, how can you make a tone on a violin? By trying it, and keep trying. I can't tell any man how to judge a cow, though there are certain indications that are very potent with me. No man can tell how to make a tone on a violin, but give me the violin, and I can try to make it. I can some times succeed better than others. It is in the study of the animal that we succeed. I will talk just about five minutes about that. The whole question with the cow is one of mother-hood, maternity. The man who has in him the delicate instinct to judge maternity, who has a clear understanding of the functions of maternity, who knows what it means, as far as he can know, to be a mother, and thereby judges this principle by all its conformations, will become instinctively a good judge of a cow, for, as the Hindoo says, — and my friends, we can very profitably go back to these old Braminical days, and in the old Braminical

literature we find dropping here and there among those wonderful people of three thousand years ago, such expressions as this, "Oh! mother of the race, oh, wonderful life." "Oh! wonderful soul of Brahma." Now, the old Brahmins worshipped the cow, and when we select a cow, we should approach the question from that stand-point.

The butter temperament in cows is simply this, a cow may be a large milk producer, and not a good butter cow. The evolution of butter fat in the milk is the work of a distinctive temperament. I have become convinced of that, I have data covering many cows, in which I have made individual studies on this point. For instance take the flank gland, you can not see it, you can only feel it by passing the hand over it, here on the flank you find a little gland running up and down, now, if that is sharp, easily detected, it is one of the most important indications of a butter temperament. I want you to look at all these cows here, and see the wonderful agreement of outline. Look at the eye; the peculiar expression of sensitiveness and delicacy, and you have in that a very clear indication of the agreement of temperament that runs through all of the breeds, if they are distinctive butter animals. Find me a decided butter cow, and I will find you a cow that is full of nervous energy and power. One that can be easily spoiled, very sensitive to abuse, very sensitive to change of location, very sensitive to the manipulation of an agreeable milker. She is a wonderfully delicate, sensitive mother. I have had hundreds of men dispute me on this theory, and I have asked them to go home and try it, and they have confessed to me that they found themselves convinced when they studied the temperamental character of their best cows.

Find me a cow of the beef temperament, lymphatic, and she is not sensitive, she is easy and content. The butter cow may be the most docile animal in the world, but she is docile through good usage. I have a little cow in my yard that when I sit down on the stool and say, "Dolly, how are you to-day?" she will come up to me and caress me, and is always gentle aud docile. Not a single thing about her but what would indicate that she is the most patient cow in the

world, yet one sharp word from me to that cow, and there is a glint of fire in her eye in a minute. My hired man struck her a blow once, and she did not get over it in some time.

Mr. Gould — Has the man got over it?

Mr. Hoard — He isn't paying any attention to that cow now.

I know it is a great infliction to stand and bear the fractiousness of a high strung cow, but I want you to go home, my friends, and make this little memorandum. Go through your herd, test your cows, and see for yourself the cow that gives you the richest proportion of butter fat in her milk, and see if you do not find that she is naturally the most high strung, nervous, energetic cow you have got?

One of the strongest indications of constitution in a cow is in the development across the abdomen, the umbilical or navicular development. You remember that a cow carries from 110 to 150 lbs. of water a day; a good cow in giving a good flow of milk drinks that much water a day. She carries, say 100 lbs. of water. Look at the wonderful development in the barrel of that cow; look at the arch of the pelvis in the cow Tritomia; that is not a beef line. This cow, Pride of Eastwood, is very deficient there, and this cow, Elegante, is not as strong as she should be, but you see this cow, Mr. John Boyd's Jersey, "Gabriella Champion," has a very strong pelvic arch. Now, what is the meaning of this, simply, and physiologically this: Here is carried on the great maternal functions of the cow; here must be development, and for a purpose. The beef cow is a miser, she stores up her food. She never gives it to you until she is put upon the block. The milk cow is a beneficent creature; she gives to you largely.

Look in your cow's anatomy for a relaxed expression; show me a tight, close ribbed, compact, snug, round, beefy, mutton-shoulder cow, and I will show you a cow that will appropriate of the feed you give her, two-thirds of it for herself, and but little for you. Show me a cow that is relaxed in her expression with a bright eye, clean bone, muscle like a race horse, with a large, full brain, strong back-

bone running from the head clear through; every one of these cows show the sharp shoulder. The cow Tritonia has one of the finest milking forms I know of. Gabriella Champion has a remarkably fine form. Now, if we could get you farmers to believe that it is just as essential to have a clear clean cut decided milking form in a cow, indicating that she will take her food and put it largely and surely into butter, or into milk, and not carry this mixed idea of milk and beef, it would do more for your salvation, land you farther in the race, and put more money in your pocket in the next ten years than you will get in twenty-five with present ideas.

Supposing a man wants to hunt chickens, does he get a a mongrel dog? Would he buy a half bull dog and half New Foundland, and three or four other breeds mixed up, and say, "I am in for a general-purpose dog?" How many chickens would he bag and bring home at night? Ten chances to one if he wouldn't get more sheep than chickens. Dog men have intelligence on this subject, and don't fool away their time with general-purpose nonsense; they know the essential lines of heredity, and they breed dogs for foxes, for chickens; they breed the bull dog for fighting, and for nothing else under the sun but a brutal exhibition of pugnacity. They will breed a dog that won't follow a chicken, but instinctively turn away from it. It is not accident; it is intelligent direction. What kind of a horseman would it be that would say, "I will bet my money on a part Norman, part Clydesdale and part Almont?" He would lose his money, wouldn't he, confounded soon? He ought to. The farmer that goes into the expense of dairying, and pours costly food and costly time, and products raised on high priced land, down the neck of a general-purpose cow, and gets beat, ought to be beat. But the farmer who will become a dairyman *per se*, will say, "Here, I want the best kind of a cow I can get, if I am going to spend any time on her," that kind of a farmer will succeed in dairying.

Perry Goodrich wrote me the other day, giving a statement in which he showed that fifteen cows the past year made 300 pounds of butter apiece, and the average in this

county of Monroe, is not 125. Now, when you have a difference like that, 175 pounds of butter as between cows, it tells a story of lost profit for your pocket book. It costs no more to feed Perry Goodrich's 300-pound cow for the support of her carcass, than it would cost you to feed any cow, and have her do her best. The difference is not in the feed so much as in the cow herself. Now, if you are a dairyman, and intend to be real dairymen, for the sake of yourselves run a dairy machine, and not a no-purpose, a general-purpose, all-sorts-of-purpose, suckotash sort of a cow. I don't mean to laugh at your mistakes, I want to see you succeed, and when I know that these blunders are being made all over Wisconsin, and men refuse to read the verdict of the laws of nature hereself, blindly fighting nature all the time, they are like the Jews, when Christ was about to be crucified, they would not ask for the Saviour of the world, but asked that a thief be released unto them. So asks the man to-day that will not take a good cow, but asks that a scrub be released unto him.

Now, I always plead earnestly. I did when I courted my wife, and I carried her off in three months from the time when I first saw her. She said a little while ago she wished she had had a longer time in courtship, and less time in married life, she thought she would have enjoyed it better. But her loss is my gain.

I have to be forgiven for a great deal sometimes, I get so earnest about these things, it seems as if I could make every man see it as I see it, but I can't.

Mr. Boyd — Can't it be said that breed is sometimes made by feed?

Mr. Hoard — Not very soon. I am supposing that every man starts even now, for this community right here, every man starts out to-morrow morning, selecting what sort of cows he will have. He is fortunate in the fact that some wise men have gone ahead of him.

One thing more, gentlemen. This question that is so often insisted on, "is a cow hardy?" is a very deceiving one to you. A man who went up to look at my cattle one day asked me, "Do you think that little Jersey heifer is

hardy?" said he, "That Guernsey is four times as hardy." Well, I said "Go down and look at my wife, she is a woman by all that constitutes a woman in delicacy, and in sensitiveness of temperament, but a man who would take her to be as hardy as a squaw, would not have much appreciation of such a woman." Now, as I said a moment ago, a true dairy cow is a grand embodiment of motherhood. She gives to you her very heart's blood, she says, "it is yours completely, only for the sake of the motherhood in me, treat me well." When a man asks of that cow, "is she hardy?" And then holds up the similitude of a bullock or steer, the beefy embodiment of meat and strength to that delicate machine, that man fits into his place like a round pin in a square hole, there is too much daylight all around him. A dairy cow, my friends, can not be hardy in that sense, and be a profitable cow. She must have care. She is sensitive, she is nervous, she has a peculiar susceptibility to change, to cold, to warmth, and you ought to write over every cow's stanchion, the words "comfort" and "care" in large letters, and you ought to remember that your pocket book is at stake. What is the meaning of hardiness to thousands of men? It means, "Will she let me be lazy," "Will she do fairly and give a good flow of milk, while I neglect her, or go down town and play pool?" No, she won't. She will swamp her owner sooner or later. You will say she is good for nothing, but she will find her man sometime, somebody will look into that peculiar form, and see where her purpose and beauty is. Handsome is that handsome does. Then she will meet with appreciation.

Now, cows come into our county from this section by droves, and I often look them over. I have seen hundreds of them go down there, and go into Elgin, and in a year or two I find that some have changed immensely, they found what it was to blossom out under appreciation. I once heard a very bright woman say, after she married her second husband, "My first husband was a brute, my second was a man," and her eyes sparkled, and she added, "I never knew what it was to be a woman until I was brought into the presence of that man." When she was allied to a

brute, there was a suppression of all her womanhood, but when brought into the presence of a man who appreciated her, out blossomed her womanhood, with all that was best in her. So deal we to-day with all these wonderful forces of life. These wonderful instincts, these wonderful functions that God has given for our use, and if we are intelligent in our understanding, of them, we learn this to be the truth, "All things shall be added unto him that loves the cow."

Pres. Morrison — We will now proceed to close this convention. I never attend a meeting like this, but what I feel inspired and go home filled with new resolutions, and new ideas. Our success as farmers, as dairymen, lie almost wholly within ourselves. If we go home and put into practice some of the successful experience given, we shall not depend wholly hereafter upon our meadows, but will put in a few acres of fodder corn and eventually the silo will come to our aid; we shall cease to make ten or fifteen cent butter, but a choice granulated article that will satisfy the most fastidious. We will also mix forethought and business calculation with some of our hard work, and endeavor to fill up the wide gap between the actual and the possible and one way to do it is to put better blood into our stock.

Our dairy convention and farm institution are doing a good work; elbow to elbow; shoulder to shoulder we strengthen each other, and sometimes in my enthusiasm with the work I picture in imagination what the result will be in the future upon our favored state Wisconsin.

"Aye, splendid in her ample lap,
Are annual harvests heaped sublime!
Earth bears not, on her proudest map,
A fatter soil, a fairer clime.
How sing her billowy seas of grain!
How laugh her fruits on vine and tree!
How glad her homes, in plenty's reign,
Where Love is Lord, and worship free."

This closes the fourth annual convention over which I have had the honor to preside, and although it was my desire and wish to be relieved, as other duties were imperative, and required my entire time, yet it is not without feelings of regret, as the entire membership of this association have ever accorded to me a full, free and most generous cooperation, and it is to their unselfishness and unity of purpose that has made the Wisconsin Dairymen's Association a synonym of success and progress. Gentlemen, I thank you for your many acts of kindness and for the assistance you have ever been ready to extend, and I trust that our relations in the future will be as satisfactory and harmonious as in the past.

In conclusion, I desire in behalf of the association to thank the citizens of Sparta and vicinity for their hospitality, their kindness and courtesy. I feel, in fact I know that it is just such assemblages as this that gives us new life and new strength, and is one of the recognized forces of agricultural education throughout our state.

I now declare the Fifteenth Annual Convention of the Wisconsin Dairymen's Association adjourned *sine die.*

MISCELLANEOUS PAPERS.

A PLEA FOR FODDER CORN.

BY JOHN GOULD, AURORA, OHIO.

[*Read at the Wisconsin Farmers' Institute.*]

Nature made a special contribution to the prospective American farmer when she selected America as the home of the maize plant — a plant which for either forage or grain has no equal in the world. It is a plant for medium and high latitudes; a plant that has no unapproachable pushing powers and, in good seasons and poor, no other plant makes a better growth or a braver struggle and, in either case, gives double the amount of fodder per acre than can be made from a grass crop, and more than twice the feed value in grain than any other cereal; this double advantage comes at the same cost for land and labor.

So far as authentic history goes, corn is a native of this country; and so far as this lecture goes the corn is here and I propose to make the most of it and that most is 1,600 million bushels, enough to load 3,200,000 cars with 500 bushels each, or five solid freight trains from San Francisco to Boston, and its fodder if all saved would be ample to winter every animal in this country.

Its adaptation to all soils and sections where there is an average rainfall, gives it wonderful value and gives us a leverage that we scarcely comprehend. As a grain plant, it needs no commendation. Corn is not an exhaustive crop, and yet it pays to keep land in good heart, for which we may get good crops year after yearfrom the same field; still corn feels the invigorating effect of a stimulant.

Corn is a standard ration either fed as grain, or as fodder. In the east the farmer saves every blade and stalk, plac-

ing the forage in value with the best hay; but as we go west, its abundance causes its value to be underated and it is fed if at all, in the most lavish manner and with the most wasteful methods. But with a change in the value of our crops, lower prices mean cheaper production, and cheaper production means a yet more abundant and cheaper produced ration. We have it in corn, and the moment that we fully appreciate its true value, that is not only a standard but an almost sure crop and more sure than any other, then it is we shall put our faith more and more in fodder corn and prize it in the future as we have neglected it in the past.

Sixty million acres of corn were raised in the United States last year, an acre and a half for every head of horned live stock we have, and yet we feed millions of tons of hay. when, if it had been saved and equally distributed, the necessity of the western ranch cattle industry would not be as conspicuous as now. It is in this very corn plant that we have such an immense advantage over Europe in pork and beef, and why should we not use our maize fodder to give us other leverage in cheap butter and cheese, now that we are protected from hog and bull butter?

One of the chief reasons why we have neglected this valuable crop comes from the poor success in handling it and the great waste in preserving it to get its full feeding value. Forty per cent. of the usual fodder crop is lost between cutting and the manger, and the rest has been considered more than paid for in labor and bother with the refuse.

Now the farmer is slowly finding out that his hay crop is the most expensive and costly ration that he feeds. The meadows do not and will not one year with another produce as they once did, and one year with another, one ton per acre is above the annual production of hay of the best sorts. Two acres of meadow are needed to winter one cow. A Wisconsin man, whose name I can not now recall, puts the price of hay in the barn at $8.00 per ton. Is that too high? Now with better understood methods of caring for corn fodder, will it longer pay to devote two acres of meadow land to winter a cow when that same land put into fodder

corn and well taken care of, will better winter six? Can you longer afford to feed a cow $16 worth of hay in the winter, when you can winter her quite as well on fodder corn, that at the most will cost you $5.00?

Now let us go back a little and look into this matter. We all know that certain kinds of fodder corn will produce on good land a remarkable growth. It is a persistent grower; and the same influences that stimulate the growth of hay forces forward the fodder, while the drouth that burns up the meadow, affects the corn less, and its broad leaves catch all the dew. Each few drops of passing rain, and one is sure of half a crop of fodder, when the hay crop will be scarcely worth the cutting. Last year was as dry as known in northern Ohio for thirty years. My hay crop was a failure, but the corn crop grew and matured sixty-five bushels of corn per acre, and on an acre of ensilage corn that I did not have room for in the silo I cut 120 big shocks of corn that had, despite the weather, grown ten feet in height, at least six tons of cured fodder. Those of my neighbors who planted this fodder corn for forage, tell me that with all their discouragements they this year got from over half to three-fourths of a full crop, and many a man who invested in two bushels of ensilage corn, whether or not he had a silo, thanks his lucky stars for the forethought.

Now before we go further, let us plant a crop and get it ready to harvest in some way. Plant early. Don't put it off to the last moment when the season has begun to change; and the old sages begin to prophesy dry weather. Put it in just as well as you know how. Plant on sod ground, if possible, and put on some manure. The old saying is: "Corn will bear a great deal of manure, and manure will bear a great deal of corn." Put on the manure early and let the rains wash the soluble manure down into the soil. Make the land as fine as possible. The same rule applies to this as to any crop. The largest part of the cultivation of corn can be given before it is up. Make the soil fine, so that the roots will have something to anchor to at once.

In Ohio we have three ways to plant. With a grain drill, closing up the holes in all the hoes but two, making the rows

as near three and a half feet apart as possible; a regular corn drill for the purpose. I notice a Whitewater firm advertise a good one; and another way is to mark out with a shovel plow, scatter the seed by hand, turn the drag bottom up and go crosswise of the furrows, or use a plank granger, fastening short to it so the front side or end will not dig into the soil; simply cover. These are all rapid ways.

Plant not over twelve to fourteen quarts per acre. Have the kernels three and four inches apart in the rows. Have the rows three and a half feet, so as to get space for cultivation, and make the labor of cultivating all horse power. If you put in a scant half bushel per acre, you will get a greater growth than where a bushel is used and far more than when two are drilled in. With fourteen quarts you secure two great results, maturity of fodder and grain.

When corn is sown thickly it never comes to possess full nutritive powers. The development of the corn plant is to make grain, and if you deprive it of that function, it has nothing to live for, and never puts its powers to work to store up starch, sugar and gums to make an ear of corn. Grown in drills, the sun and air gets among it; it thrives and grows, and throws out its broad green leaves and, when it tassels out, the silk also appears, and, instead of a crowded, little spindling stalk of sickly green look, a look that tells it is destitute of stores of nutriment, we have a forest of fodder that analysis shows to be almost as fully charged with nutriment as the stalk of field corn. Dr. Gosseman, of Massachusetts, found that a stalk of crowded corn that was forming no ear had only from twelve to fifteen parts of dry matter and as high as eighty-two per cent. of water, while a stalk developing an ear had twenty-eight parts of dry matter and seventy-two parts water, or twice as much vegetable matter per ton as the first, and while the first only had traces, the latter was rich in starch, sugar and nitrogeneous matter.

How shall we cultivate? Use a slant tooth harrow before the corn is up and at least twice afterwards. This not only keeps the soil fine, does fast cultivation, but kills millions of little weeds. There is this peculiarity about weed killing.

Nature can sprout a new weed cheaper than she can repair a broken one and every weed killed is one less. When the corn gets too large to drag, use a cultivator. What do we cultivate for, to benefit the crop or rip things up from the bottom, and of what use is the latter except to cut off, tear up and destroy corn roots, the very thing you want to let alone to make your corn plant put forth growth? Every root you cut off nature has to stop and repair damage, and she does it by sending out new and more roots, and these take up elements that the plant needs. All we need to do is to scarify the soil, use a cultivator with many but fine short tongues and keep the surface free from weeds. The old idea that a deeply stirred soil, and that often, attracts moisture and holds moisture is not borne out by the facts. Land that is disturbed as little as possible holds its moisture best. With fodder corn the broad branching leaves will soon drive out the cultivator and probably twice will be as many times as one will run through it. It will soon so shade the ground that no weeds or grass will do it damage, and the many needed workings of field corn will not be wanted in fodder corn.

When the ears begin to glaze a little, then is the time to cut, to get the greatest feed value. This brings us to another inquiry: How shall we cut up this big crop? With us, it is wholly done with a sweep rake reaper — one that uses rakes instead of a reel. The machine is driven along a row, and the reaper lays it down in big gavels. The largest growth of fodder corn was cut with a reaper, and was the best job I ever saw done.

After you have got the crop down, draw it as fast as possible and put it in a silo; but we will have to shock it up. If I did not have a silo, I think the reaper the best way to cut it. The Hurd brothers, who join farms with me, have a 400-ton silo, and another farm of like size; they put in large quantities of fodder corn and shock it, running it through the cutters in the winter; but all is cut with a reaper. This year they shocked their fodder corn by reaping it, and letting it lie three or four days in the gavel to wilt. They then

tied it up with tarred strings and set it up in shocks of about 125 bundles each. The wilting prevents the liability to sour and rot in such large shocks, and they soon settle so solidly together that they are storm proof. After standing a couple of weeks, they take a few of the outside bundles, cross two of them on top of the shock and then lay eight more bundles on top, two in each angle of the cross.

They tell me, and they hire all labor, that it cost them as much to cut and tie up and shock this fodder as it did to put the other crop, acre for acre, into the silo. Now they have all this fodder to draw and run through the cutters, and lose the waste of storm litter. The crop in the silo is ready to feed, while the other has yet to be drawn and made ready.

Another way is to set up three stakes with poles fastened to them, and the fodder is drawn out of the field and leaned upon both sides of these poles and fed out as wanted.

I have known a few who stack the fodder in little round stacks about a pole set in the ground; but this, by any method, takes as much more back-aching work to do, first and last, as it does to put it into a silo with twice handling the stalks. Then it is done for all winter, with no waste or bother, and every pound of it is made in presentable shape, and the animal eats it without rejection, and with as little loss in feed value as can be devised. Every farmer places first and last the loss of fodder at 40 per cent., and Sir John B. Lawes, who seems to have started out to not like ensilage, is at last forced to admit that 10 per cent. is all the loss he can detect in ensilage as compared with the stalk when put into the pit. But this does not quite express it either, for you see at the start there is a gain of 30 per cent. in the saving of fodder, and the other grain, that is not yet explained by the cow herself — that three tons of ensilage is worth the the same as one ton of best hay or fodder; and yet the three tons of ensilage dried weigh not quite half a ton.

Without discusssing the silo question beyond this, so far as I can learn, the Ohio fellows this season have put their crop of ensilage into the pits for less than 40 cents per ton all labor counted, which makes ensilage as cheap as hay at $2.00 per ton.

We as dairymen want a cheap and abundant food for our dairies, so that we can yet make a profit for our labor, and have the cows not only consume all the farm produces, but large quantities of purchased grain besides. Without this cheap and abundant ration, we are working on a pretty small margin. Now, if by a little new blood in our methods, we can make a larger cultivation of corn and better methods of preserving it, we can secure this coveted advantage. Why don't we enter new fields, and put ourselves into contact with a method that will enable us to produce greater and more certain crops, and thus make milk at one-half the cost that we now do? If we had a more sure crop, we could, with our other advantages, lay down butter and cheese in Liverpool cheaper than the English or Danish farmer can, and that is what we want. Even if more fodder corn will only keep up our average, it is yet cheaper to rely on it than grass, for corn fodder is a surer crop than grass, and a fodder crop is safer than a field of hill corn. We may talk of millet as a safe and sure crop. It is not always so. Millet failed with us this season in that it did not mature more than one-third of a crop.

Fodder corn, raised as I have said, will produce a large growth of corn ears, and almost enough to balance the ration. A little "ship-stuff" will do it, and you will get 88 per cent. of the latter back in the fertilizing value of the manure; so that you will get double pay in return for the mill feed. So with large fields of cheaply raised and secured fodder corn, the dairyman can not only keep more cows but better. He will be more largely independent of seasons, storms, or drouth. Then he is not too largely at the mercy of Providence, and the grain and feed sellers, and, instead of bemoaning his lack of stock feed, and the high price of all that he is forced to buy, and the low price of that which he has to sell, he will, while not neglecting his meadows, and his seeding to clover, nor failing to keep his weather eye towards a well ordered system of farming, order yet another bag of fodder corn seed, and put in yet another "patch" to fodder. In the winter, when there is a cry, "let us go down to Egypt and buy corn," he will laugh, and tak-

ing his wife and boys will go to the farmers' institute, and there will lift up his voice, and testify to the truth of these things.

FEEDING COWS FOR PROFIT.

BY C. R. BEACH, WHITEWATER, WIS.

[*Read at the Wisconsin Farmers' Institute.*]

In feeding for profit four things are necessary — the right kind of cows, the right kind of surroundings, the right kind of feed, fed in the right way.

I shall not here present the claims of any particular breed, though I think the Jerseys preferable as butter makers; but keep what we will, we need to weed out the old, the unthrifty, the hard milkers, and the vicious. The most of us keep too many *old cows*. If the cow has been as highly fed as she ought to be, and milked each year as long as she probably will be, she has exhausted her vitality sooner than we are apt to think. From five to eight is the golden age.

Aside from her age, I will mention a few characteristics which I deem desirable in a cow kept for profit. She should not be above the medium size — under rather than over. I would have her spirited and at the same time docile and intelligent; I would have her thoroughly feminine in her organization, yet I would have her characterized by that robustness of constitution which is indicated by the word hardy. All other qualities, however good in themselves, lose much of their value unless united with a good constitution.

The difference between a dairy of carefully selected young cows, and one in which reference is had only to numbers, will often amount to the difference between loss and profit.

Cows, for profit, should be kept in warm, well-ventilated stables, admitting as much sunlight as possible, nights as soon as frost begin to show itself, and at all times in the winter when the weather is uncomfortably cold, except when out for water. A cow will bear a good deal of confinement, if the stables are light, dry, warm and well venti-

lated. My idea of comfort is not to let the cow stand out-of-doors from 8 o'clock in the morning till 5 at night, when the mercury is below zero, and drink icewater to keep up the circulation. To you who think such care all right, let me suggest that on such days, as soon as you have let out your cows, you take your easy chair round to the northwest corner of the house, and sit there until it is time to do chores at night. In the meantime, let your wife bring you a dinner of ice cream. Follow this up for a week, and then weigh yourself, and see how many pounds you have gained, and how much milk of human kindness you have left in you. To keep the heat of the body at 98° is the first use that every living animal makes of the food consumed, and if that is not enough, it burns the fat accumulated in its own body. Warmth then is but another name for food saved, and keeping cows comfortable will constitute a large factor in the question of profit.

Next to comfortable quarters, the cows must have an unlimited supply of *pure* water, easy of access. A cow will live longer without food, than without water; nor will we wonder at the fact, when we remember that three-fourths of her live weight and 85 per cent. of milk is water. The man who has made money from a lot of cows whose supply of water was a stagnant pond hole, in which the cows waded in summer and drank through holes cut in the ice in winter, has wrought a miracle, besides producing a lot of unhealthy milk at the same time.

Much has been said and written on the benefit of warming water for cows. The statement is made that, at an agricultural school in France, the milk of a cow was increased ½ by warming the water up to 113°. Mr. Boyd of Chicago, and others, claim similar results. The heat evolved by burning a pound of butter will raise the temperature of 12,000 pounds of water. If a cow drink 40 pounds of water at 32°, in order to raise that water to the temperature of her body (98°) it will require 2640 degrees of heat, equal to that contained in a fifth of a pound of butter. While it does not necessarily follow that by warming the water up to 98°, the cow will make a fifth of a pound more butter, it goes to con-

firm the opinion that warming water is a benefit, and it also goes to prove that it would be for our profit to keep our drinking water from freezing, which can be done by keeping our water tanks covered, and by building houses over and around them, and stuffing them with horse manure or straw.

Regularity in milking and feeding is also important, and uniformity in amount, not lavishly to day because we have plenty, and scrimpingly to-morrow because we are short; and the ration should be in proportion to what the cow is expected to do. A dry cow, or one nearly so, will not need the same feed as the cow in full flush of milk.

The cow should be taught to eat what is given her clean. Said a dairyman who found a large amount of hay in the mangers after the cow was through eating: "I think my man will starve my cows to death by feeding them too much." There is philosophy in what he said. Cows, children, and men should be taught to eat what is set before them without turning up their noses.

Having selected our cows with care, and provided amply for their warmth, and comfort, and supplied them with pure water free from ice, what and how much shall we feed them that we may realize the largest profits? What ensilage may do or what science may discover I shall not discuss. With our present knowledge and surroundings, good pasture grass in summer and good early cut hay in winter are the bases of all profitable feeding, for either milk or meat. Grass is said to be the lazy man's crop. It is also the wise dairyman's chief dependence. Do not let me be understood to say his only dependence, for it should not be; but I do claim that it is the foundation of all good, as well as profitable feeding. It is a safe crop requiring but little labor, and labor you know means cost.

Scientists tell us that all nourishing food is mainly (not entirely) composed of two elements — nitrogeneous or muscle forming, and carbonaceous, used in producing heat and fat; also that these elements have a certain ratio to each other, or else the food will not be properly assimilated, and a part will be lost; that a well balanced ratio for a cow giv-

ing milk would be one in which the digestible nitrogeneous and carbonaceous elements in the food should have the ratio to each other of 1 of the former to 506 of the latter. Grass grown upon old well seeded pastures contains these elements in almost exactly these proportions in a digestible form, and if to be fed alone, stands at the head of the list of all our feeding crops, not only for cheapness, but for quality. Here let me say that pastures that have never been plowed are much superior not only in the quality of the grass furnished, but in their ability to stand drouth, and in furnishing a uniform supply of fine soft feed through the whole season.

The only possible objection to pasture grass alone is, that it contains too much water; this defect may be remedied by feeding daily a small ration of it to the cows with three or four pounds of wheat bran. If the cows were fresh milkers in the spring, I would always feed the bran all summer, increasing it if the grass began to fail before corn fodder was ready. For cows that had been giving milk during the winter, and due to come in in the fall, the grass feed is ample. To get the greatest profit from pastures (and profit is what we are after), they should be so stocked that the best of the grass is eaten by the time fodder comes in tassle, and don't be afraid of beginning to feed it too soon, and be sure you have enough to give your cows a full feed at least once a day until they are well into winter quarters. If you have considerable left over, it will not be lost. The amount of fodder corn raised should not be less than an acre to four cows, and the land should be rich. The cows due to come in in the fall are by this time dry, and for them the fodder corn will be feed enough. For those that come in in the spring, and as fast as the winter milkers come in I would add to the corn fodder ration, 6 or 7 pounds of wheat bran for the reason that the fodder is largely carbonaceous and to make a well-balanced ration, needs the nitrogeneous elements contained in the bran. This feed will keep the cows up to their best until they go into winter quarters, which should not be later than November 1.

If our best dairymen fail in one particular more than

any other, it is in not putting their cows into winter quarters soon enough in the fall. If grass grows upon the pastures after this, it will be worth more for winter protection than for feed. So much for summer feeding.

The German formula for a daily winter ration for a cow giving milk is 24 pounds of dry organic food, of which 15 pounds should be digestible, containing of nitrogeneous matter 2½ pounds and carbonaceous 12½ pounds, or the nitrogeneous to the carbonaceous as 1 to 5. They tell us that we may feed with profit hay, fodder corn, corn stalks, straw, corn, oats, barley, wheat bran shorts, beets, carrots, potatoes, in fact everything that grows on the farm; but they should be so combined in feeding as to contain the required amount of digestible nutrients in nearly the proportions named. Thirty pounds of timothy hay, which is about the amount that a cow is supposed to eat, when fed alone contains 11 to 12 pounds of digestible food of which 1¼ pounds will be nitrogeneous and 10 pounds carbonaceous. So hay alone will not furnish a full milk ration. It is claimed by a newspaper correspondent, who visited the Darlington farm where 250 cows are kept for butter, that their daily rations were 8 pounds corn meal, 8 pounds bran and 8 pounds of cut hay mixed and fed together. This would very nearly correspond to the German ration; but a cheaper ration and one equally well balanced was used by Professor Henry in some experiments last winter. It consists of 16 pounds hay, 7 pounds wheat bran and 5 pounds of corn meal.

The best dairymen of Wisconsin, while they have no fixed and arbitrary rule by which they feed their cows, use corn meal and bran for the grain feed and the most of those who are engaged in winter dairying feed it in rations very similar to those I have named. I will use them as the basis of a few figures, to see if they will yield us a profit. That the figures may be few and simple, I will use but one cow and have her come in the middle of September. By the plan I have previously outlined up to December 1st, her daily feed will be 7 pounds bran and what fodder corn she will eat; from December 1st to the middle of May we will feed daily 16 pounds hay, 7 pounds bran and 5 pounds corn

meal; from the middle of May till her year expires pasture grass. The account will stand:

7 pounds bran daily, 240 days, 1680 pounds, at 12 cents per bushel..	$10 80
5 pounds corn meal daily, 165 days, 825 pounds, at 16 cents per bushel	6 60
16 ponnds of hay daily, 165 days, 2640 pounds, $6.00 per ton.....	7 90
¼ acre of fodder corn ...	3 00
Pasture	6 00
Cost of feed for the year	$34 32
Interest on cow	15 00
Total	$49 32

Upon this feed, she will, for 200 days, give 20 pounds of milk per day, and for 100 days, she will give 15 pounds per day, making 5,500 pounds of milk. Sixty-five days she may go dry. As she has given the most of this milk in the winter, 23 pounds will make a pound of butter, or 240 pounds from the 5,500 pounds of milk. The price at which good Wisconsin creamery butter sold in the open market at Chicago the past year did not vary much from 24c net; but as the 240 pounds which our cow has made is mostly winter butter, it will bring 25c net, making $60. The skim milk at 20c per hundred will be worth $10; and the calf $1, making the income from the cow $72 for an outlay of $49.32 or $22.68 above cost. Have I not shown you how a cow can be fed to profit these hard times;— but lest you think my figures fanciful and not attainable let me verify them, and I have taken some pains to do so:

James Banks, my next door neighbor, told me that his dairy of sixteen common cows had yielded him 5,900 pounds in a year; Eben Cook, another neighbor, that his dairy of twelve common cows gave 7,000 pounds. Both men sent to a cheese factory. David Flack, of Elkhorn, in answer to a letter, said that his annual income from a dairy of thirty cows had for several years been from $62 to $84 per cow. Roswell Gage, of Richmond, told me recently that for the year ending April 1, 1880, his dairy of fourteen cows averaged 335 pounds of butter, and that he should beat that the present year. So my figures are not beyond the bounds of

possibility, but deduct $12, leaving $6, and then you have a good round profit above cost.

In conclusion, let me say, that feeding cows for profit is *a chain of many links all of which must be equally strong* or else the chain is worthless. If any of you are inclined to keep a dairy I would say, don't unless you are willing to fulfil all the conditions. To you who love cows and are willing to give their care your personal supervision, if you will seed down your land, stock it full with good cows, care for and feed them as I have outlined, make butter and send it to market every week, you can not fail of having a yearly income equal to the interest on all the capital invested, and money expended for labor and necessary expenses and some to spare — which will enable you to pay your hired help and taxes, educate your children, provide marriage portions for your daughters, keep your wife in silk dresses, pay the minister, the doctor, and the *editor;* and at the same time increase the fertility of your farm, adding to your own wealth, and to the wealth of the state.

BUTTER MAKING IN ORANGE COUNTY, NEW YORK.

BY J. M. HUNTER, EAST TROY, WIS.

Although I have been a dairyman all my life, I am still learning, and know that there are many who are my superiors in the business.

I was born and brought up in Orange county, N. Y. In those days it became famous, and widely known as the butter county, and held the lead in the New York market for forty years. I have no doubt that other counties along the Hudson made as good butter, but I think her supremacy was maintained because of churning the whole milk. This will give a higher flavored butter, but involves so much additional labor, that it must be abandoned. The butter was packed in firkins, or small barrels, holding from 80 to 100 lbs., and the whole year's make was sold in the cellars to buyers coming out of New York in the fall.

Sloops sailing on the Hudson, made fresh delivery out of the question. This packing, and keeping so long, proves what excellent butter makers they must have been. No thermometers to guide the temperature were used; no scales to weigh the butter and salt were thought of. The butter-milk was mostly washed from the butter in the churn, by dashing in five or six pails of water, and then standing half an hour. It would then be removed to large wooden bowls, and the salt worked in with a ladle. For the want of a thermometer churns sometimes got bewitched, and a hot horse shoe or two would drive the witch out, that had been keeping the butter from coming an hour or two.

After a while steam was used on the Hudson, and fresh delivery began in about 40 lbs. returnable tubs, made of white oak, and strongly hooped. Packing soon went out of use, which was better for producer and consumer. The old dash churn was the first churn I ever saw. It was worked by hand till some one invented a sweep to attach to it. This was on the lever principle, like a pump handle. The advantage of this you would soon appreciate if you tried to work the plunger without the handle. Churning in those days was done mostly by the colored people. The next improvement for churning was a horizontal wheel, set more or less on the slant, on which could be used a dog or sheep. In some large dairies they were made strong enough to put on a horse, and drive six or eight barrel and a half churns. I shall never forget the rejoicings of the colored people when the first dog machine was set up in our neighborhood. The emancipation proclamation, giving them their liberties, made no such outbursts of joy as did "dat dog on de wheel." They saw at once their emancipation from the old dash churn. Springs and brooks abound in Orange county, and quite a number could use them for churning by water. Last of all, the endless chain-tread power came into general use, which no doubt is the best of all the appliances for churning on a small scale.

After an absence of twenty-five years, I made a visit to old Orange, and found it had passed away, as a butter county. The farmers were about all in the New-York milk

business. First the cheese and butter factories got in, and broke up the home making of butter. These proving unsatisfactory, they went into the milk business. They, and what few factories are left, are now under the control of the New York Milk Exchange, Limited. The exchange sets the price of milk, monthly, which the farmers are obliged to accept, being all broke up at home, and unable to do anything with their milk but sell it. I found them not as well off as formerly. I found their farms had lost in value, and were not as well cultivated, as when they made up their own product at home. From this condensed history, of the once most famous butter county in our country, you are all at liberty to draw your own conclusions. It looks to me like a warning to us farmers, not to give over our individuality as good butter-makers on the farm to creameries or cheese factories, but labor, and qualify ourselves, under the guidance of these institutes, to make a first class product at home. I hope this institute will take this short history of a once famous butter county into their most earnest consideration, as I believe they have only the good of the farming community at heart.

We farmers, though isolated, are a sociable class. When we are daily taken from home to the factory, where we meet many of our neighbors, we talk more or less time away, and get home late enough to do but little work in the forenoon. Riding on the road don't produce a relish for walking behind the plow.

I do not take a stand against cheese and butter factories. I know they have done the country much good here in the west. They have been a God-send to many farmers, who think they know all about making ten cent butter. I predict the factories will give better satisfaction in the west than they did years ago in the east. The reliable tests of milk and cream now in use in factories will place each patron where he belongs. In conclusion, I would ask, what assurance have we here in southeastern Wisconsin, with Milwaukee and Chicago at our doors, that the blighting effects of a New York Milk Exchange, Limited, will not be visited upon us?

SILAGE VERSUS DRY FODDER.

BY PROF. W. A. HENRY, MADISON, WIS.

The question is asked, "Is silage more valuable for feeding than the same material would be if cured and fed dry, and if so, why?" If not, why not? This question is plain and to the point, most certainly, and a true answer — whoever can give it — will be a most valuable aid in discussing the subject: So far as I am aware, there is not a single feeding trial on record that shows that ensilage has any decided advantage over the same original material carefully preserved by drying. I have followed pretty carefully all that has been writen on the subject, heard some of the most enthusiastic friends of ensilage show up its advantages, but I can not modify the statement made above. The wisest men may be mistaken. "Of what earthly use then, is the silo?" says one, "if dried fodder is just as good as ensilage?" "Just what I expected," says another; "these professors are always behind the procession instead of ahead and leading it," says the ensilage enthusiast who shakes his head ominously and sets his teeth somewhat tight together as he thinks he sees one of them trying to block the wheels of progress. "Are all the statements of those who have used the silo false, then?" asks another.

Come, let us reason together, I would say to enthusiasts, doubting ones and those that are indifferent. All of us, no matter what we believe are ready to admit, that the silo must eventually stand or fall on its merits. If it is an aid in our agriculture it will push its way ahead, now that it is well advertised; if it fails it will soon be a thing of the past.

Years and years ago, when Horace Greeley was one of the leaders of agricultural thought in this country, sub-soiling was the rage in agriculture; experiments were reported by farmers that were overwhelming in proof of its advantages. Not only for common farm crops must we go down two feet into the soil and turn it up, but for pear orchards and vinyards we must trench the soil at an enormous cost, not less than five feet deep. Then came the cooked feed

craze, which lingers yet. I can refer any one who cares, to hundreds of pages in agricultural reports and papers where the experiments of scores of farmers are brought forward to show that the way to advance in farming was to cook everything that was fed to stock. Such names as Prof. Mapes, Prof. E. W. Stewart, and George Geddes are connected with this movement. I can bring forward scores of disinterested witnesses who showed that it doubled the value of food to cook it. A most learned gentleman of Ohio, Mr. Sullivant, in an elaborate essay, and one of the best ever written on Hog Feeding, shows that while raw corn fed to hogs produces nine pounds of pork per bushel, ground corn will produce twelve pounds, and to cook the meal will give fifteen pounds of pork per bushel. An enthusiastic editor of one of our eastern agricultural journals a couple of years ago discovered a method of cultivation by which he had produced over 1,000 bushels of potatoes per acre and he promised "to do it again," but he has not fulfilled his promise up to date. Time and experience show us, one and all, that we are very liable to be mistaken in this world.

HOW CAN HONEST MEN BE MISTAKEN?

I am ready to admit the large yields of milk and butter produced by feeding ensilage — that no one can question. I have yet to talk with the first man who has fed ensilage that was not satisfied with the returns he got from his feed. The point I desire to make, however, is that it was the magnificent crop of fodder corn more than the silo that made the good results possible. A large per cent. of those who use the silo had never grown a crop of fodder corn before the trial with the silo and in their endeavor to make the silo a success they have produced an immense crop of fodder corn and packing this away for winter without loss have been struck with surprise at the results obtained. Had these same parties grown an equal crop of fodder corn and saved it without loss by drying and kept a careful account of the milk and butter made from it they would have been surprised at the results, I do not doubt. The basis for successful dairying in the northwest is the fodder corn crop,

and the silo has done a vast amount of good indirectly in showing its value. "Honor to whom honor is due," and first of all let us take off our hats to the Indian corn plant, which is among plants what the cow is among animals, the greatest food producer known.

BUT WHY BUILD A SILO?

Yes; why build a silo when corn fodder is just as good, is a most proper question to ask. But is cured fodder just as good? Theoretically, yes; but not one time in ten as practice goes. The fall of 1886 in this section gave us magnificent fodder, but usually our weather is such that we lose by weathering no small part of our corn crop. If stacked it is liable to heat, and if the shocks stand in the field until ready to feed, the heavy snows of the northwest make the handling very difficult and entail a large per cent. of loss. If we husk corn and hire it ground we will lose or give away fully one fourth of the crop—the husker gets, say, one-eight, the miller another eight (more if he is not honest), and then we have the labor of shelling and hauling to mill, to husk and bind into bundles, then re-handle these bundles several times more is a more laborious task than to take the unhusked shock of corn ears and all at once to the feed cutter when it is fed through and stowed away into the silo. What, says one, put dry shock corn into the silo? Exactly. What can be more economical from either point of view, considered as a labor saving method or a way of saving all the food value of the corn crop. But will such fodder keep in the silo? If perfectly green fresh fodder will keep in the silo and if dry hay will keep in the mow, do not be afraid of this shock corn. Once cut and stored away no harm can come to it and it is ready to feed without waste. Remember, it will not be so dry as we are apt to think. I have stormed at the chemist in our laboratory for reporting forty or more per cent. of water in corn fodder which I thought fairly dry, and when he repeated his work and showed me he was correct in his first determination, I subsided and made up my mind things are not always what they seem, in this world. We can cut and shock our fodder and get it

out of the way of frost, and as soon as all is safe turn about and begin filling the silo. If part of our shock corn must be husked for the pigs all well and good, but let the husked fodder go into the silo along with the other.

COST OF THE SILO.

"But the enormous cost," says one yet doubting, "of a silo to hold a corn crop." We build hay barns rather than stack the crop out in the weather, and for the same good reasons we may build the silo. As the silo can be built perfectly well without any floor in it, it is not necessarily an expensive building — indeed, unless one studies to make it costly, it is an inexpensive structure. Into this room or series of rooms, let the partly dried crop of corn come direct from the feed cutter, and after being well tramped down in the corners and along the edges, let a layer of tarred building paper be spread over the surface, then a layer of boards, then ten inches of sawdust or four of earth. Better food for dairy cows, or live stock generally, I do not believe can be made than by this process. And no waste! Here is just where the silo has an immense advantage over the other ways of handling fodder corn.

AN APPEAL TO A GOODLY SIZED AUDIENCE.

I wish the farmers who every fall drive the wagons through the fields of ripe corn "snapping" the ears, and who then turn the cows into the "stalk field" to ramble at will, along with the north wind, in search of nutriment from the tattered, bleached leaves that rattle on the frozen stalks — I want these farmers, I say, to try in a small way the silo. Then, again, that other class who wear out their patience and their pants at the knees husking the long rows of shocks, these farmers who are way ahead of the first-class named, I wish them to stop and think if they are not making a good many useless motions in the effort to make an ear of corn palatable to a steer or cow. These farmers feed their stalks in the barnyard and have from forty to seventy per cent. wasted by tramping under foot. The small class who feed long fodder in mangers in the barn, and have often stopped

and wondered how it is that every cornstalk in the barn had to stick to the fork tine half a dozen times from stable to manure heap, this class, I am sure, are not far off from the better method.

For a score of years all our energies seemed to have been bent on learning how to plant and cultivate a corn crop and how wonderful the progress. It is comparatively a light and surely it is a pleasant task to plant and cultivate but in caring for the matured crop until the introduction of the silo we have made no progress in this last particular. I predict in the near future many improvements, some in sight, others not yet within the scope of our imagination, and so, I am a firm believer in the silo after all and have given the reasons for my faith.

PASTURES—HOW TO MAKE AND HOW TO IMPROVE THEM.

BY FRED. E. CARSWELL, LONE ROCK.

The subject of pastures is one that is of importance to nearly every farmer in the country. Twenty years ago there was but little attention paid to it.

The customary mode of handling cattle in this western country then, was to feed them from straw stacks during the winter, and let them hunt their living in the woods or on the commons during the summer. But as the country grew older, western people have learned what the eastern farmers learned several years in advance of them, that the handling of live stock is one of the best methods the farmer has of gaining a livelihood and acquiring property.

This has led to more advanced methods of feeding and pasturing cattle, as well as improving the fertility of the farms, and more than this, it has taught farmers to study, think and act for themselves, without jogging along in the same old ways year after year.

Now, as dairying and stockraising are becoming the leading industries of the country, the pasturage, as well as the

care and feeding of stock is becoming one of the principal topics of conversation and argument among farmers.

My views may differ from yours, and if so, I hope you will criticise and give your views in return.

Pastures that are best suited for beef cattle may vary somewhat from those best adapted for dairy cows. This point I will pass over for you to illustrate more fully in your subsequent argument than I have time to give the subject. In speaking of pastures, my remarks will mostly be confined to pastures for milk production, as my experience has been mostly with that kind.

The subject I have taken may be divided into two distinct topics: First, "How to Make a Good Pasture." Second, "How to Improve It."

First, all plowable land should be fall plowed, and thoroughly harrowed before seeding. Extra harrowing and well pulverizing land are essential for good success in grass seeding. Use a variety of grass seed, such as red top, Kentucky blue grass, timothy, white clover, Alsike clover, and orchard grass. Use plenty of red top seed on low land and blue grass on the high land. Alsike clover is preferable to mammoth red clover for pastures.

A black, sandy loam, with clay sub-soil, makes the best natural pasture land, although most any of our Wisconsin land can be made good with proper handling.

The best pastures for all seasons consist of part low land and part upland. Low lands yield the most bulk of feed per acre and stand drouth the best, but upland pasture is more nutritious and is preferred by cattle.

The hills we have make splendid pasture lands by clearing off the timber and brush and then sowing grass seed just as the snow is leaving the sidehills in the spring, while the ground is yet soft and loose from the action of the frost.

Seventy-five to one hundred pounds of land plaster should be sown per acre, as soon as the snow leaves the ground. The earlier the better. Land plaster sown with grass seed when seeding wild land that has been cleared of brush will facilitate the germinating of the seed and give the young plants a vigorous growth. Our bluffs and side hills make

the best pasture by never trying to plow or cultivate them. There are from two to four inches of very rich soil on the surface that produces an abundant growth of tame grasses that is preferred by cattle to the grass grown in the valleys or cultivated land. So don't sell your farms because they have bluffs and hills on them, for they make the best pasture, and the cattle can graze on both sides of the land, which they can not do in a prairie country. In arranging your pastures for dairying purposes have at least a day pasture and a night pasture, never allowing your stock to feed on the same field night and day. It is better to have two day pastures and two night pastures; then change your cows the first of the week from one day pasture to the other, and the middle of the week change them from one night pasture to the other.

This plan will give them fresh feed every three or four days, and allow the grass a better chance for growth. We should not allow too large a growth to get the best results from dairy cows, although very close cropping will decrease the quantity of grass production, and permanently injure the grass roots. This we can not always prevent, especially in very dry seasons like the past summer has been.

I believe grass to be the most succulent and best adapted for milch cows when it is from two to four inches in height. Beef cattle fatten beetter on grass that is a little larger and more mature. As pastures diminish in production in the months of August and September, feed green corn and other feed to supply the deficiency, so that your pastures may never be very closely cropped. If on a portion of your pasture the cattle seem to shun the feed and allow it to grow up large without feeding it off, sow it heavily with land plaster, and you will find the next season they will feed on it as well as any portion of the field.

Cattle should not be allowed to graze on pastures in the fall when the grass is covered with frost, as they will destroy in an hour as much feed as they will eat all day.

Keep your cattle off from grass land in spring, when it is very soft, as they do a large amount of damage tramping down grass roots. Always try to give your cows an abund-

ance of pasturage, but keep it fed close enough to preserve the succulent and nutritive qualities of the grass. A great great many plow up their pastures too often, the older the pasture the better feed they produce. Old pastures not only produce a better quality of food, but also a greater quantity if they have been well managed.

One of the cheapest and best methods of renovating worn soil is to pasture it a few years. If it is badly worn it will also need rotating a few times.

Sandy soil makes splendid pastures by using mostly clover for seed, with land plaster and plenty of barn-yard fertilizers.

Fertilizers with a large amount of ammonia in them are very beneficial to cold, damp soil which cattle are very liable to shun, owing to a lack of nutritive qualities, this being absorbed by the grass roots.

In conclusion I will say, fertilize your pastures as you do your meadows, and aim to give the grass roots plenty of nitrogeneous food if you desire good milk and good results from dairy cows.

THE CALF, AND HOW TO RAISE IT.

BY AUG. A. PAULSEN, NEW HOLSTEIN, WIS.

[Read at the Farmers' Institute at Green Bay.]

In treating the subject of animal husbandry, we should begin with the most important part of it; with the calf. This subject may, at first thought, seem of very little importance to you, for indeed, a calf in itself is an insignificant little being; but, when we stop to think that in this little creature are combined all the requisites which go to make the future cow, its importance must be apparent to even the most sceptical.

Again, owing to the increasing consumption of meat and the comparatively early age at which beasts are hurried to the shambles, the rearing of calves becomes more and more a subject of importance, and worthy the attention of the farmers; besides, the high prices paid for butter, milk and

cheese and the comparatively high price of feeding stuffs, brings the subject even more prominently before the people.

Owing to the cheese industry, farmers have not given, and are to-day not giving enough attention to the raising of calves. In order to bring a large amount of milk to the factory, the little creatures are sold to the butchers at an early age, and their career of usefulness has ended. The result of this must be apparent to all. The direct result is, that the standard milk yield of our cows has decreased, for the reason that not enough attention is given to their improvement, which can only be done by raising the calves from the best cows.

This carelessness on our part means less milk in the future, and consequently smaller receipts.

We shall now first consider the "residence" of our subject, or perhaps, more correctly

THE CALF HOUSE.

This should be a building constructed for the comfort of the little inmates. There should be windows on the south side, so that the sunlight may fall on the calves part of the day. It should also be well ventilated, but at the same time kept free from cold currents of air. Chilly draughts are more detrimental than an equal degree of the same temperature in a still atmosphere.

Care must also be taken to have the stable warm. Exposure to cold is injurious to the young animal, for which extra food is little compensation, to say nothing of the complaints that are induced by the exposure of the body to a low temperature.

The calves should either be tied up, or kept loose in stalls, which should be cleaned out every day and kept comfortable, by dry litter.

The utmost cleanliness is imperative, when it is desired to make calves thrive. It is folly to expect little animals to grow when they are crowded together in close and unclean pens.

FOODS.

The first in the list of such for young animals, is new milk. "Nature provides in this food for young life, every element required to build the bones and extend the frame — to grow the muscles, tissues and nerves, and to round out into lines of beauty and harmony, the whole animal."

To know the value of milk as a food, we must look into the combination of elements in it.

The following is an average of the composition of cow's milk: Caseine, or flesh formers, 4½ per cent.; butter, 4 per cent.; milk sugar, 4½ per cent. and water, 87 per cent.

It will be observed that milk is rich in nitrogen, or muscle forming food; and muscle we must aim to produce, in feeding for growth.

Next to new milk, the most important, and a *more profitable* food, is skim milk. This still has all the elements contained in new milk, with the exception of the 4 per cent. of butter, removed in the form of cream. But this latter can be easily supplied in the form of oil meal or flax seed gruel.

Skim milk is, in reality, the principal adjunct to successful calf husbandry; and we find, in practical feeding, that it is actually as good, and cheaper, than new milk. Of course oil meal must be added to it; but this is cheaper by far, than butter.

The last in the list of liquid foods is

WHEY.

The composition of whey is as follows:

Water, 93 per cent.; milk sugar, 5 per cent.; 1 per cent. albuminous compounds and 1 per cent. fat and mineral matter. Sugar, one of the elements of whey, is an important food, but only one — and no animal can live upon sugar alone. We see, then, that whey has but little feeding value, and our advice is "don't."

Much rather feed water, and substitute the caseine and butter by some grain, that will produce muscle, bone and fat.

HOW TO FEED.

With some farmers it is customary to let the calf run with its dam for the first week of its life. This, to say the least, is cruel. It produces in the mother an affection for the calf, which, when it is taken off, will make the cow restless for several days, and will even decrease her flow of milk.

Besides, it is wholly unnecessary; it is productive of absolutely no benefit whatever. It will not *help* the calf, but it will *harm* the cow.

Take the little creature and put it in a dry, clean stall; make it feel comfortable and teach it to drink. This latter, you will say, is not so readily accomplished; but really there is nothing easier than this. Don't get angry, don't whip and kick the little creature, and *don't swear.*

(It is related that trying to teach a calf to drink, has made a profane man out of many a good and noble hearted farmer.) But why all this?

Take a shallow tin dish with nice new milk in it and offer this to your calf, keep perfectly cool and patient, the guidance of the finger at the most is all that is necessary, and the chances are nine to one that the calf will drink freely when it is a quarter of a day old.

A great victory of patience over wrath.

For the first week milk the cow at least four times per day, and feed the calf the same number of times. After that three feedings per day are sufficient, but never less. Keep the pails well scalded so that they will be sweet and clean, for nothing is more detrimental to the growth and health of the calf than a sour, unclean pail.

Begin with six quarts per day and gradually increase to eight quarts by the time the little animal is three weeks old. Then substitute skim milk, begin with eight quarts and gradually increase to twelve quarts per day at the age of three months.

To make skim milk as nutritious as new milk, boil oil meal in four times its bulk in water, and mix this *one* with *two* parts of milk and feed blood warm. Milk should always

be sweet; sour milk is injurious. Feed regularly and *always* three times per day.

Those farmers who bring milk to the factory, may find it impossible to feed skim milk. To such I would say, try the following:

Give the calves new milk for the first two weeks; during the next two weeks feed new milk mornings and evenings, and skim milk at noon; the following two weeks feed skim milk mornings and evenings, and *oil meal and water* (prepared as above) at noon; and after that get the little creature entirely on the water and oil meal. If good care is taken, fine calves can be raised on the above plan of feeding. As a general rule, and on the long run, perhaps, it is not advisable, because, if we raise calves at all, it is undoubtedly best to feed them with the very best, and with the most nourishing food that we can get.

THE GRAIN RATION.

In calf raising we feed, either for growth or for fat; and we must select the kind of grain accordingly. In feeding for growth we must aim to produce muscle and bone. For such purpose, ground oats and bran, mixed in the ratio of two of the former to one of the latter, is undoubledly the best ration that we can get. Feed regularly, but never too much. Begin with a handful per day, and increase to four quarts when the calf is four months old. Together with this, feed as much hay as the little animal can digest. On this ration calves will gain from two to two and a half pounds per day.

In feeding for fat use corn meal instead of the oat meal. Make a mixture of three-fourths corn or pea meal and one-fourth bran; begin with a small quantity of this and increase gradually to four quarts per day, when four months old. Feed hay as above, and your calves will gain three pounds and over, per day.

We have had calves, fed in this way, that weighed, at the age of six months, 620 pounds; they sold for $21.60.

By a careful computation we find that they consumed:

16 bushels corn at 45c	$7 20
150 pounds bran	75
150 pounds oil meal	1 88
1,700 quarts skim milk at ½c quart	8 50
Total consumed	$18 33
Net profit	$3 27

Of course the net profit in this case alone, would induce no farmer to raise calves for market; but we must bear in mind that everything produced on the farm; milk, corn and bran, was being fed at a good profit; and right here is the point—in feeding stock the farmer converts his grain into money, and more money than he can possibly get if he *sells* it for market value.

One more word in regard to corn. This product is excellent for grown up stock, for fatting purposes; but it is entirely too heating to be of any use to growing stock. If care is not taken in regard to fat producing grain, we will get upon our hands that worst of all entailments in stock growing—stunted growth.

DISEASES.

Among diseases to which calves are subject, *scours* are the most frequent. These are generally the result of either sour food, uncleanliness or overfeeding. As in all other cases, so that golden maxim: "An ounce of prevention is better than a pound of cure," holds true in this one.

Should the disease, however, have set in, then the best way to proceed will be as follows:

Starve the little animal for about a day. Then feed again in decreased quantity, sweet skim milk, gradually increasing the ration as the patient improves. At the same time two or three raw eggs should be given at each feeding. The calf should also be removed to a dry, clean stable and the disease will soon disappear.

Now, in feeding young animals, we must aim to give them a good start, and then keep them going.

Cattle gain more in weight during the first two years of their life, than ever afterward.

To substantiate this statement I append the following figures, taken from an experiment made in England:

Three calves were tested and they gained during the first ten months, 384 pounds. During the next twelve months, 884 pounds, and during the next twelve months, 425 pounds.

The same report gives the average daily increase of fourteen calves, as follows:

	Pounds.
First month	161
Second month	178
Third month	209
Fourth month	165

Both these reports prove then that an animal will gain the most during the first few months of its life, and after it has passed its infantile stages, will again gain more in the first year than ever afterward.

Feed then, while the animals are young, feed *good* and with *care* and *thought*, and success will crown your efforts.

MANAGEMENT OF THE FARM DAIRY.

BY S. B. MORRISON, FORT ATKINSON, WIS.

As regards the management of the farm dairy, I would say as did Joseph Cook in regard to living: "The best way to live is to live the best way." So I would say, manage your dairy the best way. If you don't know the way, then attend dairy meetings, visit well regulated dairies, consult wise men, and subscribe for good papers.

One important point to consider is the herd of cows composing the dairy. Let it be large enough to occupy a prominent place in the farm economy. If it does not, it is apt to be slighted when there is something of more seeming importance to be done. Do not poke off all the work on the female portion of the household. They used to do that in New York state, and a man usually married from two to three wives before the mortgage was lifted. A fine herd of cows is the result of years of labor and study on the part of the

owner, but when secured are a source of profit as well as pleasure to the fortunate possessor. If a man purchases his herd he finds some that dry off after being milked a few months and then run to beef. He will also find a few elevator cows. I have borrowed the term from Bill Nye, who once run a newspaper in the loft of a livery stable. He had two means of ascent, one by a ladder and the other on the modern elevator plan. When he wished to ascend on the elevator he went behind the mules and tickled their heels with a straw. These, with the short milkers, should be discarded.

The remainder will form the basis of a fine milking herd, if crossed with a thoroughbred of a good milking strain. Few dairymen realize the benefits derived from liberal feeding and especially those feeding for butter. The Hon. Zadoc Pratt, of Green county, N. Y., reported in the New York State Agricultural report the yield of fifty cows for five consecutive years. The first year it required 39 pounds of milk for a pound of butter, the second year 33 pounds, third year 29 pounds, fourth year 23 pounds, fifth year 21 pounds. The sixth year, with sixty-four cows, the increase being heifers, 19 pounds of milk and 223 pounds butter per cow. The seventh year with eighty-four cows, 224 pounds butter per cow.

Prof. Stewart says that he has taken ordinary scrub cows and added 75 per cent. increase to production of milk in two years, and in the same time reduced the pounds of milk required for a pound of butter 35 per cent. Princess 2nd, in her test in 1884, made 27 pounds 10 oz. butter in seven days, 11 7-10 pounds milk making a pound of butter. The next year she made 46 pounds 12½ oz. butter in seven days, and required only 6 4-10 pounds milk for a pound of butter. Here was a gain of 44 per cent. in richness of milk as the result of judicious feeding. The same is true of Mary Ann of St. Lambert who, in 1883, made a pound of butter from 9 1-10 pounds milk and in 1884, a pound from 6 6-10 pounds milk.

We would infer from these statements that those who practice buying cows, and milk them for one season only,

keep their cows the most unprofitable year, as the same feed fed to these cows in succeeding years would produce so much more milk and butter, besides the valuable heifer calves with which to recruit the herd.

Prof. Stewart once purchased two cows, 4 and 6 years of age and very ordinary milkers, fed them to improve if possible their milking qualities. One the second year produced sixty per cent. more throughout and was profitably kept until eighteen years of age. The other increased one-third in milk and one-half in butter and, during her nineteenth year, gave 6,278 pounds of milk. And please note this—that a heifer calf from each before development proved very ordinary milker, but calves from them afterward proved excellent milkers.

There is positively no excuse for poor products in this enlightened dairy age. These result only from ignorance, shiftlessness or pig-headedness. If a woman wants to use her finger for a thermometer, and churn all day and far into the night, it is her privilege. If any one wants to work the butter as did the good German's wife he may do so. She offered some butter for sale; the dealer jokingly remarked that it was not sufficiently worked, when she replied: "Oh, yah! he vork him goot, he vork him seven times mine vife." A man once remarked that his mother-in-law had spent at least two years of her valuable life in overworking her butter. In preparing your butter for market, if you cover the package with remnants of defunct underwear instead of parafined paper or new, clean muslin, don't expect an extra price because the button holes are worked or the edging left on.

If you see in the market reports that butter is strong and cheese active, don't be misled, but reserve your strong butter and active cheese for home consumption, and don't try to fool the commission men. Given good cows, and all the conveniences for manufacturing a good article of butter and cheese, if the market is not good, if you only get a shilling for butter and five cents for cheese, the debtor side of your bank account will loom up in fine style. I think I am safe in saying that if all the butter sold to merchants in

Wisconsin during the past year, and which they were obliged to sell as grease or Samson butter, on account of its superior strength, had been contracted to parties who are willing to pay from 20 to 30 cts. for good, sweet, bald headed butter, the difference would extinguish all the store debts contracted by the parties who made the butter. There are hundreds and thousands of families in our large towns and cities who would gladly pay from 20 to 30 cents per year, and many now go without it because they don't know where to get it.

The money I once spent in looking up customers for my butter in Chicago, paid me better than if I had invested it in shares of the Gogebic iron mines. We can't get one dollar per pound for our butter as the Darlingtons' do, for the Darlingtons' senior were making fine butter when Wisconsin was a howling wilderness, and chances like theirs are as scarce as angels on South Water Street; but most any one making a good article can find sale for it at remunerative prices. What would you think of a manufacturer in Chicago who would manufacture a thousand self-binders, and then sit supinely down and wait for the farmers to come and pay him fifty per cent., less than the cost of manufacture, because he was afraid it would not pay him to advertise. Now my farmer friends, we are not sticks in the mud, but manufacturers as much as any one, and we have money invested which we ought to make pay a fair dividend on investment, and it will pay if we apply business principles, as well, if not better, than other business, for statistics show that ninety-five per cent. of our business men fail, and while our towns are fast filling up with retired farmers who have gained a competence, where are the retired business men? Many of them have passed over the river into Canada, and others are getting ready to, when the next hard time comes. The dairyman who don't water his milk or pack eight pounds of butter into a seven pound pail, is a fine specimen of the *genus homo*. He can sleep well o'nights, while the the lawyer can't for the lawyer is obliged to lie(?) first on one side then on the other. But above all, my farmer friends avoid as much as possible the commission and middle-men and handle your products yourselves.

CREAMERY BUTTER ON THE FARM.

BY F. C. CURTIS, ROCKY RUN, WIS.

The question for discussion seems to imply, and the market reports seem to verify, the implication that creamery butter is better than butter made on the farm, or what is usually called dairy butter. Upon investigation we find very little really good butter offered for sale in small interior cities and villages, and in the large cities we find more than half of the butter offered for sale to be very bad. It is useless to ask the dairyman who makes the bad butter, for his or her butter is always good, and to intimate anything to the contrary is dangerous in the extreme.

The creamery man insists that the dairy proper can not make good butter, and that all the bad butter is not only made by dairymen, but that they are incapable of learning to make good butter, for the reason that they are so conceited and stupid they can not be reached by ordinary reasoning. There is much truth in the charge of the creamery man, but is it necessarily true? Can we not in some way single out these bad butter-makers so plainly that they can not shirk the responsibility? Show them their error, and in doing so show them that they can save half of the labor in making the butter, and get five to ten cents per pound more for it.

All who make butter in rolls and prints and market it at stores and in villages are the most reprehensible. Those who pack their butter in jars fail to do as well as they might or could if they packed in tubs, and many who pack in tubs do it improperly — attempt to hold it for a better market, ignorant of the fact that it deteriorates in keeping, however well it is made. All this butter is sold to the reluctant storekeeper, who, if he ever had any knowledge in handling butter or conveniences for doing so, has long ago lost it, together with all his labor and care and reputation as a dealer in butter. He feels obliged to buy this so-called dairy butter; then he is obliged to sell it as he can. He buys it at a price so low that the seller is dissatisfied and seldom gets a

full return for his outlay. All of them tell the same story: "I have almost always lost on butter, and heartily wish that there would never be another pound offered me to purchase."

"Now," says the creamery-man, "I told you so; you have admitted all I claim." Not so fast, Mr. Creamery-man; we have got another view to take in this discussion. We claim that there are dairymen who make as good butter as can be made in any creamery. We claim that the best package of butter that can be made is, or can be, made by the person who controls the cows for making it, and can make a sufficient quantity at one churning to fill said package. We claim that we can take any person of common sense, sixteen years old, and teach him or her to make first-class butter in one week, *i. e.*, provided they have had no previous knowledge of butter-making, and consequently are not puffed up with conceit.

There is a little prospect and hope of reforming the conceited ones by making them angry — getting their eyes open, so they see themselves as others see them. The stupid and ignorant are hard to reach, as they seldom put themselves in the way of information or care to better their condition.

We have as briefly as possible presented the situation as we understand it, and will now endeavor to point out a remedy for the errors recounted. In the first place we will endeavor to bury out of sight all that our pupils know about butter-making — all except the cows. These we will feed well and shelter from inclement weather. We will purchase tin cans, 8½ inches in diameter and 20 inches deep, at a cost of about 60 cents each; these are simply deep tin pails with close fitting covers — no patents called for unless you desire to use more money. Strain the milk as soon as possible or convenient after being drawn from the cow, and place it in cold well water, the temperature of which is 49°.

The principle involved is the sudden cooling of the milk from 98° to as near 39° as we can, that being the lowest and best temperature for cream raising on this plan. But 49° will answer all practical purposes, and is a temperature we can command upon the farm at all times without the aid of

ice. It is important to keep the temperature of the water in which the milk is set as cold as we can for four or five hours, and then it should not be allowed to get warmer than 62° within twelve hours, when it will be found the cream has risen and can be skimmed or dipped off with a funnel-shaped skimmer made for the purpose, or a small tin soup ladle. If it is desired to let the cream remain unskimmed longer than twelve hours, the cans can remain in the water, or some cool place, twelve hours longer. The cream when skimmed and added to other cream, should be well stirred together to produce an even degree of ripening or acidity. It is desirable to produce a slight and even degree of acidity in the cream, within thirty-six hours after milking, when it should be churned at a temperature of 62° as near as possible. An even and proper degree of acidity produces the desired flavor; too much acidity destroys it.

Our scientific friends inform us that acidity is soonest produced in alcoholic substances by exposure — spread out thin in an atmosphere of about 90°. I presume the same principle is involved in cream ripening or souring, as the sugar in milk and cream is an alcoholic substance. I find no difficulty in getting the proper degree of acidity without special effort in spreading out the cream to be acted upon by the atmosphere. Prof. Arnold holds that the old-fashioned tin pan is preferable to the deep setting for cream-raising, for the reason that the cream is spread out on the milk and gets a better ripening thereby. I hold that the old-fashioned tin pan for cream-raising is double the labor, and is accountable for almost all the bad tastes in dairy butter. It requires a pure atmosphere and a regular 62° temperature — requirements that can not be commanded in one farm house in one hundred. It is exposed to cooking and other odors, which it absorbs; it is neglected by the overtasked person who has it in charge, and the result is dairy or store butter, with its nauseous smells and tastes so offensive in many cases that it can not be used for food.

The creamery-man again says: "I told you so; you can't make good butter." Very well, Mr. Creamery-man, will you take the cream that dairy or farm-made butter is pro-

duced from, and take out its half rotten and absorbed odorous tastes, and make it into good creamery butter? There can be but one answer and that is an emphatic *No!*

The creamery-man will require the cream to be raised substantially upon the plan I have described, but will not allow so much latitude or different ways of setting the milk in the water. I have a cistern holding about 150 barrels, which is 15 feet in depth. This cistern is a reservoir of water for the farm stock, and we have a pump with a five inch cylinder that draws water rapidly. It has a curbed opening on two sides about three feet square, upon which is a small shafted windlass resting in iron bores, crank and rag-wheel, with a latch or catch to hold the windlass at any point desired.

The windlass is attached to a strong rope with ring on the lower end; to this ring four straps are attached, each four feet in length, with a rein-snap on each. As the cans have bailed handles the snaps are very handy, but it will be found that small ropes will be nearly as convenient in place of the leathers and snaps. Your cans can be let down at once by a person of moderate strength, or each can be let down separately, each having an independent rope.

The water in the cistern is supplied by a windmill pumping from a well 110 feet deep, and as the water is liable to rise and overflow the cans, they are filled only within about three inches of the top. The cans remain in the cistern twelve hours and are then removed to the house. Standing in a proper place they may remain 12 hours before skimming, or remain longer in the cistern, or skimmed at 12 hours.

This plan has many features to commend it; the bug-a-boo about lowering and raising is of no weight with me, and I should be slow to change it for any other plan, even with ice gratis, which few have, although very desirable. A shallow well, or well of moderate depth, could be used for this purpose, and while made especially for it, had better be roomy. It may be stoned up, say six feet, and the balance cemented on the earth, provided it is well covered to secure it from frost.

A plan with the least outlay is to cut off the top of a kerosene barrel between the second and third hoops, making a deep tub and a shallow one — the shallow one answering for a cover. Filled to the proper depth it answers for one to three cans of milk, but in warm weather the water soon warms up without ice and must be changed. The more warm milk put in the tub the sooner the water will warm, for the reason that the water conducts the heat out of the milk into itself.

The most important requirement for the plan of setting milk in a close vessel in water to raise the cream, is, to not allow the water to become warmer than 55°, at least for the first six hours, provided of course that the cans used are 8½ inches in diameter. If cans 6½ inches in diameter were used water even up to 62° might be used. The cream should be skimmed every twelve hours, and whenever different skimmings are added to each other they should be well stirred together to produce an even degree of acidity. The proper degree of acidity produces the desirable nutty flavor in first class butter. Too much acidity destroys or impairs that flavor and is the progenitor of many of the indescribable flavors of dairy butter.

The next and most important part of butter making is *churning*. This should or must be done in a revolving churn without inside paddles. Churns of this class churn all the cream, leaving no unchurned cream on the sides, and also greatly facilitate all the remaining labor to be done upon the butter. I have used a churn of this class called the Rectangular churn some fifteen years and can commend it for its ease of working and various good qualities.

Cream should be churned at a temperatnre of about 60° in summer and 62° in winter. This temperature should be determined with a thermometer, and not with the finger, as I consider the finger very unreliable. If the cream has been handled and churned as I have directed, it will granulate in about twenty to thirty minutes, which is soon enough for the production of first-class butter. The butter will be found to be distinctly one thing, and the buttermilk dis-

tinctly another thing, and can be separated from each other with little labor.

My usual way of separating the buttermilk from the butter, is to pour about a half a pint of good salt into a fifteen to twenty pound churning of butter, and also about half a pail of well-water. The cover is put on and the churn revolved a few times, which thins the buttermilk and makes it more dense, causing the butter to rise to the top, when the buttermilk can be drawn off into a clean vessel. If any butter escapes, it can be skimmed off and returned to the churn. I then put in another half pint of salt and a pail of well-water, give it a few revolutions and draw off as before. Without much drainage, I add a full pint of salt; put on the cover and give it a few revolutions, but not enough to mass the butter. In this condition it is allowed to rest about fifteen minutes when it will be found that the salt is dissolved and in a briny condition all through the butter. The churn can now be revolved until the butter is worked into a mass, when the brine can be drawn off and the butter packed at once into the tub.

Some may think that I use too much salt, but I find that little of the first two half pints used remain in the butter and that fifteen to twenty pounds of moist butter will dissolve another pint of salt, and where no more salt is put in the butter than will dissolve when handled as I have described the butter will not be too salt for any customers I supply with butter, but I have found in endeavoring to salt with brine, that the complaint would come, "your butter is not salt enough."

I neglected to state in the proper place that the butter color of the day is presumed to be annatto, prepared in cotton seed oil, and a proper quantity should be put into the cream just before churning.

PACKING BUTTER.

In the commencement of this paper I endeavored to show that the bad butter complained of was marketed in rolls, jars, etc., and I now will repeat and emphasize this statement, and to impress upon the minds of the dairymen the

great importance of packing solidly in tubs, and to keep it from the atmosphere as much as possible. I admit that a neat butter print looks best on the table, but it can not be marketed to advantage except to special customers. The great markets demand that it shall be in packages that can be stripped of its covering and can be cut up by the retailers or consumer in small pieces. In this form it looks almost as neat upon the table as the neatest butter print, hence, the necessity of packing so solidly that there will be no holes or ragged places to show when the butter is turned over, and the tub removed so as to show its outside appearance.

Butter made as I have described will be just the right consistency to pack from the churn, without any other working than that produced by packing in the tub with the common butter ladle. The time required to make fifteen to twenty pounds of butter in this way and packing the same, need not exceed two hours, and I claim for it much less labor over the old way that produces the bad butter so much complained of, and instead thereof I claim that butter made as I have described, can be and is, made equal in quality to any creamery butter.

BREEDING FOR A PURPOSE.

BY J. McLAIN SMITH, DAYTON, OHIO.

It was a prevalent opinion a few years ago, resulting doubtless from its political associations, that all men are created equal; equal, that is, not only in rights, but in natural aptitude and capacity. Of those who combined to organize the Abolition party, a very large proportion sincerely believed that if you would take a hundred colored children and a hundred white children, and submit them all to the same training, and afford to all the same opportunities, the two races would arrive at substantially the same goal — that the colored children would make, on an average, as moral and intelligent men and women as the white children. Nothing can be more erroneous or more directly opposed to the uniform experience of mankind. Not only are there

broad and marked race characteristics which no training can obliterate; but, even in the same race, there are family traits and personal peculiarities, disposition, aptitudes, capacities, even tricks of manner, which are transmitted from generation to generation with almost equal certainty. To say that the accumulations of the race consist wholly in material things and not also in inherited aptitudes and capacity, is to ignore alike the facts of existence and the teachings of religion. Given a child whose ancestors for many generations have been intelligent, cultivated, moral people, and you may educate him as you please, or neglect him as you please, he will almost certainly turn out an intelligent, upright man. Many children, in fact, if not a majority, are born with a character and disposition so firmly fixed in its main outlines that no subsequent training can seriously affect it. Some, by their very nature are constrained to walk in the paths of peace and virtue; others are predestined with equal certainty to go to the bad at the first opportunity. This was well illustrated by Francis Gatton, the author of "Hereditary Genius," in one of his inquiries, undertaken to determine the respective influence of education and inheritance in determining the character and disposition, he came into personal contact, or correspondence with nearly all the twins of England. Twin children as every one knows, are often strikingly alike, not only in appearance, but in character and disposition. On the other hand they are often very unlike in every particular, assuring that, when they were raised together, they would enjoy the same advantages, and be subjected, as nearly as possible, to the same discipline, and the same surroundings, the question was whether this similar education and environment tendered perceptibly to modify the original differences. On the other hand he found many twins, similar at birth, that were reared under very different conditions, one perhaps by the parents, the other by the grandparents or some other relative.

He sought to discover whether the original similarity was perceptibly modified by the subsequent training. This conclusion, after a careful and extended study, was that inher-

ited traits in every case predominate, and that education and surroundings has so little influence in opposition to this, that it may be almost ignored in the final estimate; that where the twins were alike at birth, in character, and disposition, they continued alike through all the vicissitudes of life, and that, where they were dissimilar at birth, a similar education and surroundings had no perceptible influence in changing their natural bent. Some children, it is true, are of such a mixed lineage that they have no decided character. They are born in a state which chemists call a condition of unsalable equilibrium, a slight push this way or that determines their subsequent career. With such education and environment are all important, but they are so because the breeding is defective. Indeed you may say the value of the surroundings in modifying character varies inversely in proportion to the strength of the breeding. The stronger the natural bent, which is only another way of saying, the stronger the breeding, the less important the environment or surroundings, and *vice versa*. How this comes about we do not, as yet, fully understand. There is little doubt, however, that inherited character and disposition are the same in *kind* as instructive habits in the lower animals. The better opinion seems to be, that instincts are nothing more than the accumulated experience of the race which has become thoroughly ingrained in the organization. They are transformed uniformly in all the members of the race or family, and they exist uniformly because the same conditions apply to all, and the law of the survival of the fittest tends rapidly to exterminate those individuals who fall below the average in aptitude. There is every reason to believe, however, that if the conditions of existence should gradually change, so that the present instinctive habits in any species became useless or pernicious, they would be modified to suit the changed conditions. We do know that as they become less important they are less exact and less uniform in different members of the family. As intelligence increases, opportunity is afforded for greater divergence from the common type without serious inconvenience, or, perhaps, with advantage. In the highest

animals uniformity ceases, and instinct is limited to a few automatic actions, chiefly in the very young. The accumulated experience is transmitted in capacity to learn rather than ability to do.

This in some of its aspects, is a harsh and apparently unjust law; but in it is founded all the power of a skillful breeder, and I may add all the rational trust of a moral, intelligent man in the outcome of his offspring. If it were not possible to build up a breed of animals, in which certain desirable traits are transmitted with almost absolute certainty, there would be little encouragment to spend time and thought, and money in their improvement; and if a vicious, ill-conditioned whelp of a man were as likely to get a high minded, intelligent son as one who himself possessed those characteristics, half the incentive to well doing would be taken away. But whether you approve the law or not there is no doubt of its existence and of its absolute sway. There is no use kicking against the pricks. It is the part of a wise man to submit to the inevitable. If, in some of its aspects the law is harsh, from another stand-point it is the most glorious and beneficent. Individually we can do little to elevate our nature or extend the range of thought, but if men were bred with half the care we breed our sheep that little would not be lost, but would become a pernament acquisition of the race. Indeed, on this law of inheritance is founded the only possibility of progress and improvement. But we are concerned with the law to-day only as it affects the control of our domestic animals, and our influence in moulding them to suit our purpose. There is a common impression, I believe, that the power of a skillful breeder is practically unlimited; that by proper selection he can mould the form as readily as the potter moulds his clay, and realize his ideal more slowly, perhaps, but as surely as the painter or sculptor. This is a mistake, the power of the breeder is limited in reproducing in the offspring what already exists in one or the other of the parents. He can take a head from this, a back and well-sprung rib from another, a soft touch from a third, and by skillful manipulation, he can combine them all in one individual. But when he has

done this, when he has combined in one animal all the good points which in a state of nature, are scattered through the breed, he has done all that mere breeding can do. It is just as impossible by *breeding* to produce some new quality, or to increase the development of some quality already existing, as it would be to breathe into a statue the breath of life. Improvement, in the sense of increased development of any desirable trait, is a spontaneous matter — it is nature's response to favorable *conditions* in the matter of care and food. Breeding proper can only assist indirectly by avoiding combinations which would tend to *diminish* the quality sought for. Take the milking quality as an illustration. Suppose we have a breed of cows the best of which yield, say ten pounds of butter a week. It is desired to produce a cow which will yield fifteen pounds. Mere breeding, the coupling together of the best for this purpose, other things remaining unchanged, would never accomplish the purpose, or not at least with any certainty, or within the lifetime of any breeder. You might, and in time undoubtedly would, secure a family all the members of which would prove equal to the best of the breeed as it formerly existed. That is all you could reasonably expect. The fifteen pound cow would be about as far from attainment as ever. The rational way of proceeding in such a case, and the way in which all great improvements have been secured in our domestic animals is, after selecting the best animals attainable for the purpose, to afford them facility to increase their yield through better care and more abundant food, of proper quality. Note those that respond most freely to the change, and discard the others. Keep this up, generation after generation, affording at all times the most favorable for growth in the direction desired, and breeding only from those animals which show a tendency to *grow* in this direction, and if the goal is not beyond the innate capacity of the breed, you may well hope for success. I say, if the goal is not beyond the innate capacity of the breed, you can not make a silk purse out of a sow's ear. You can not produce a fifteen pound butter cow out of a breed which, from a defective organization, can not digest food enough to

make it. No matter how thoroughly a breed *tends* in the direction desired, to make any great results possible this tendency must be backed by a proper physical organization. The point I wish to enforce at present, however, is that success in breeding owes half its success in feeding. It is useless to attempt the improvement of our domestic animals by greater care in breeding unless at the same time we improve in every particular. It is folly to spend money for an animal of choice breeding, possessing in an eminent degree the qualities desired, unless we afford its offspring an opportunity to develop those qualities fully. If we aim to winter our calves at a straw stack and allow them to pick a living in summer along the roadside, it is not likely we can improve much on our native cows. They are just what generations of such treatment has made them, and are probably as well adapted to their conditions, and yield as good returns in milk and beef as any breed in existence *with this treatment.* You often hear the remark that Mr. A or B has some fine stock which yields much milk and butter, or turns out fine beeves; but that any stock would do as well with the same care and feed. This is a mistake. As I have said, under a system of neglect and of periodical starvation, our native scrubs will probably do as well and yield as good returns or lose as little money as any breed. But they do not respond, as better bred animals would do, to improved keep. They do not inherit the capacity to utilize the abundant ration. Nature's first care is to preserve life and propagate the species. If the food is not more than sufficient for this, the parts and organs not essential to life or procreation are gradually reduced in size. Large digestive capacity, or a fully developed vascular system, is not necessary to a cow which never has enough to eat, or a full supply of blood. So a broad, level back, and well sprung ribs, while indicative of capacity to lay on flesh of high quality, require rich blood for their proper development. If the blood is lacking, nature reduces the parts to correspond. And this diminished capacity is transmitted from generation to generation, with an increasing tendency to economy in nutrition. It is a mistake to suppose that good qualities

are more decidedly hereditary than bad, or that a well bred animal is especially prepotent. Nature's ways are often inscrutable, and occasionally we find what is apparently a useless variation from the normal type propagated with extreme persistence; but as a rule, qualities which are useful to the animal, and qualities, whether useful or not, which have been transmitted through many generations unchanged are the most decidedly prepotent. An illustration of this was afforded many years ago, in the attempt to improve one of the old French breeds of sheep by the use of an English long wool ram. The French sheep were small and ill-formed but carried a good fleece. It was thought the English ram would increase the sizes and improve the quality of the flesh without impairing the wool. Much disappointment was felt when it was found that the lambs showed no trace of their English sire. In seeking an explanation of the marvel it was suggested that the French sheep, though greatly inferior, were, in fact, more strongly bred, in that their qualities, such as they were, had been transmitted through many generations, while the English ram was of a recent improved breed. Assuming this to be the case, it was argued that, if the prepotency of the French sheep could be broken down, by crossing two old but diverse strains, the produce would cross more favorably with the new breed. This was done and the results fully justified the anticipations. Leaving out of view, then, exceptional cases which are in reality inexplicable, we may say that the prepotency of an animal — the influence it will exert in determining the character of its offspring — depends on the fixity of its type; and the fixity of a type depends upon its age — the number of years it has endured unchanged. If a red Short Horn cow produced a roan, or white calf, it might cause some disappointment, but would excite no surprise. But if a Devon cow produced a roan calf, scarcely any conceivable testimony would satisfy an intelligent breeder that it was of pure Devon blood. Why? Because the red color is characteristic in one blood and not in the other — not more so than roan or white. But again, we expect, with almost equal assurance, that the produce of a

Polled Angus bull and a native cow of any color, will be a black calf; and the produce of a Devon bull and a native cow, a red calf. Why? Because in each case the color is a race or family trait in one parent and not in the other. This, it seems to me, is the bed rock in breeding. It is the foundation principle on which we must build. To develop a breed — to combine in one animal all the good points which can be found in the breed — and to develop fully its latent capacities, requires decided genius — a sort of intuitive perception of the combinations which will nick and give each trait full room for development. But to preserve a breed once firmly fixed, or to breed up a mongrel to a high standard, through the combination of improved blood, requires only care and good common sense. It is only necessary to remember that full development of the most desirable qualities requires abundant nutrition; and that the parent which is likely to prove most prepotent is the one whose type is most firmly fixed. This is the advantage, and the only advantage, so far as breeding goes in a recorded pedigree. It enables us to trace the lineage, and to know that the qualities we admire in the animal before us are race characteristics, or at least, family traits, and are, therefore, certain to prove strongly prepotent in a union with an animal of mixed blood. For this reason also a pure-bred animal — and by pure-bred I mean an animal of unmixed blood of any mixed type — is a more desirable sire than a much better animal individually, of mixed breeding, and a grade bull — the produce of a full blood of any breed from a cow of mixed lineage — is likely to prove a better sire than a cross-bred animal — the produce of two pure bloods of different breeds — unless the two breeds closely resemble each other in desirable qualities. Our fat stock shows have pretty clearly shown, that, for every purpose except breeding, a three-quarters or seven-eighths grade of any breed is as good an animal as a full blood; and they are often practically better, because they are better adapted to their surroundings, and a cross-bred animal is often decidedly superior, in size, form and feeding qualities, to either of the pure breeds from which it springs. But for

breeding purposes except to couple with a full-blood, both should be rejected. For any of the ordinary purposes for which stock is kept — milk or beef in cattle, work in horses — the one-eighth or one-quarter of mixed blood is practically lost and obliterated by the three-quarters or seven-eighths of pure blood. But in breeding the case is reversed, and the slight trace of mixed blood reduces the prepotency of the animal much more than its proper proportion. A three quarter blood bull of any breed is not usually one-half so prepotent a sire as a much commoner looking full-blood, and a cross-bred animal, for grading up inferior stock, is, in reality, little better than a scrub. The explanation in both cases is the same. There is a constant tendency on the part of all animals to breed back to the original type, which, in the case of all improved breeds is a much inferior animal. In the case of well-bred animals this tendency is checked and controlled by the long series of generations through which the improved qualities have descended. But where this series is broken by the introduction of foreign blood, or blood possessing different characteristics the tendency to revert is greatly augmented.

In breeding, therefore, each animal stands, not as an isolated individual, but as the representative of a long line of ancestors, each exerting some influence in generation. If these ancestors are all substantially alike in the qualities sought to be reproduced, or, better still, if the qualities show an increasing development from generation to generation, the animal will almost certainly prove very prepotent in transmitting these qualities. On the other hand, if the ancestry is a mixed lot, good, bad and indifferent, of diverse and inconsitent attributes — no matter how perfect the animal itself may be, it is, for breeding purposes, the veriest scrub. A common illustration of this principle is found in the human family, where one parent comes from a black-eyed race, and the other is of mixed lineage — in this respect ancestors whose eyes were black, or brown, or blue, or gray indiscriminately — the children will almost certainly, at least ninety-nine times in a hundred, follow the parent of unmixed lineage; and what is true of this obvious feature

is true of the entire individual; every quality of body and mind is just as hereditary, and controlled by just the same laws, as the color of the eyes or hair. In breeding, then, the first requisite is to know precisely what you want — in cattle, whether milk or butter or beef; in horses, speed or style or strength — and to know the particular form and qualities which go along with that you seek. These select as your foundation stock, or, if it is proposed to breed up from native cows, or common mares, select as the head of your heard, an animal in which the qualities you seek are race characteristics, or at least, strong family traits. Afford the offspring every opportunity for full developement, and success is absolutely certain, or at least, as certain as the combined action of certain parts in a machine will produce determinate results. It ought to be as easy to predict, with accuracy, the quantity and quality of milk an unborn calf will yield, when it becomes a cow, as to know the color it will have and the general form it will attain. That it is not possible to do so, is an evidence that our stock, even the best, is not bred up to its full capacity for milk, nor so well bred in this respect as for the more obvious traits of form, color and general appearance. Breed, then, so that you will be able to predict the result; above all, do not be misled by mere individual excellence. Individual excellence is, of course, the end to be attained, but, let your breeding be such that you can repeat it at will and not as a mere chance. In this view, remember that an animal represents its entire ancestry rolled or united into one. If that ancestry is of uniform, or increasing excellence in certain definite lines, the breeding qualities of the animal will, almost certainly be true and satisfactory. If the ancestry is of heterogeneous and diverse character, no matter how pleasing the individual itself may be, it is for breeding purposes, a scrub, and it will prove in the end a delusion and a snare.

ACKNOWLEDGMENTS.

Through the courtesy of Hon. Ernst G. Timme, secretary of state, we are enabled to present herewith his latest compilation of the dairy industry of our state.

The statistics are arranged by counties, and show, first, the number of milch cows; second, pounds of butter; and third, pounds of cheese produced in each county; also the total number of each in the whole state. These figures are as authentic as any to be had, and show the vast magnitude that our dairy industry has assumed.

Acknowledgments are also due to Hon. Hiram Smith, W. D. Hoard, H. C. Adams, C. R. Beach, A. J. Decker, Hon. John Luchsinger and J. A. Smith, for valuable suggestions and information respecting the present status of the dairy industry.

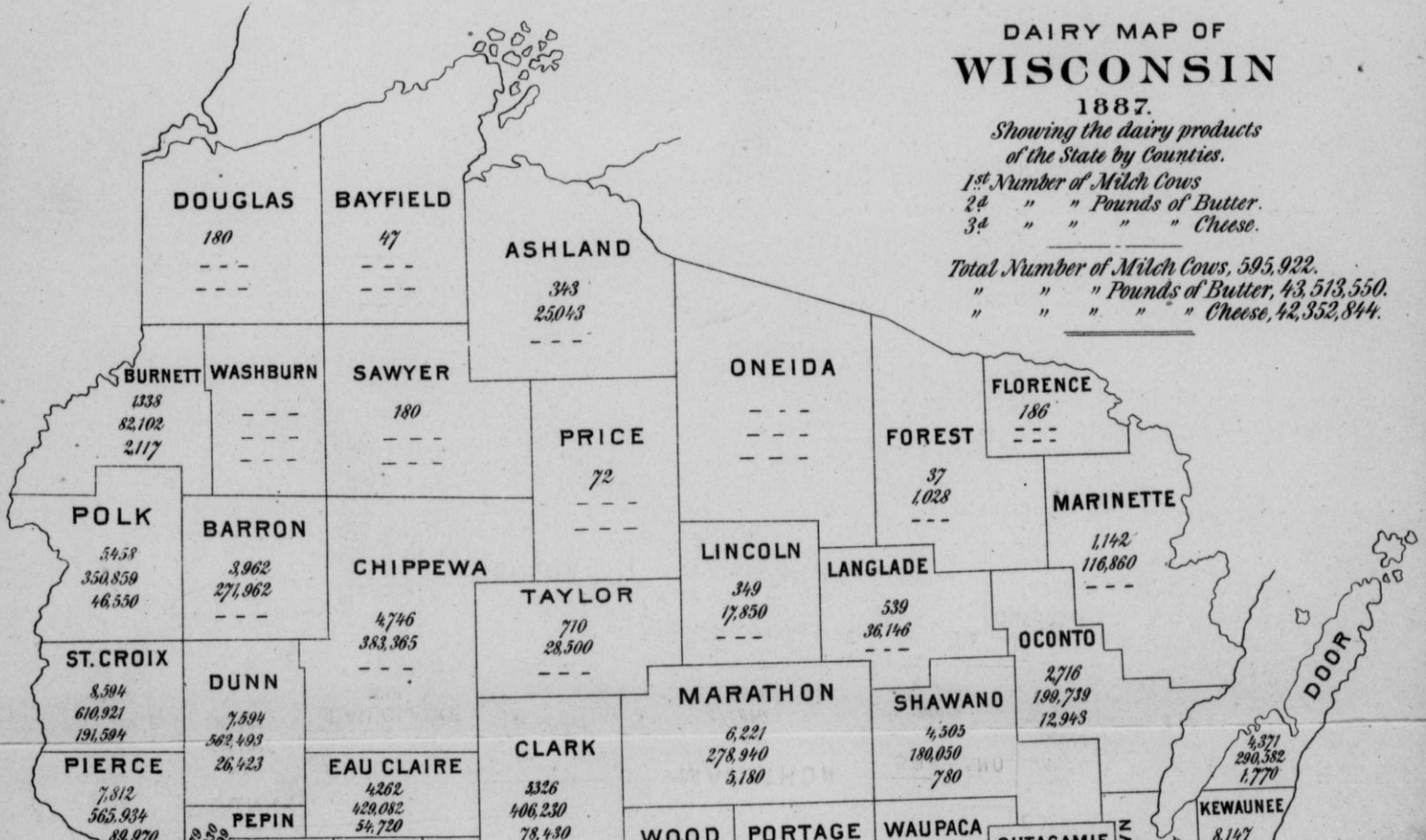
SECRETARY.

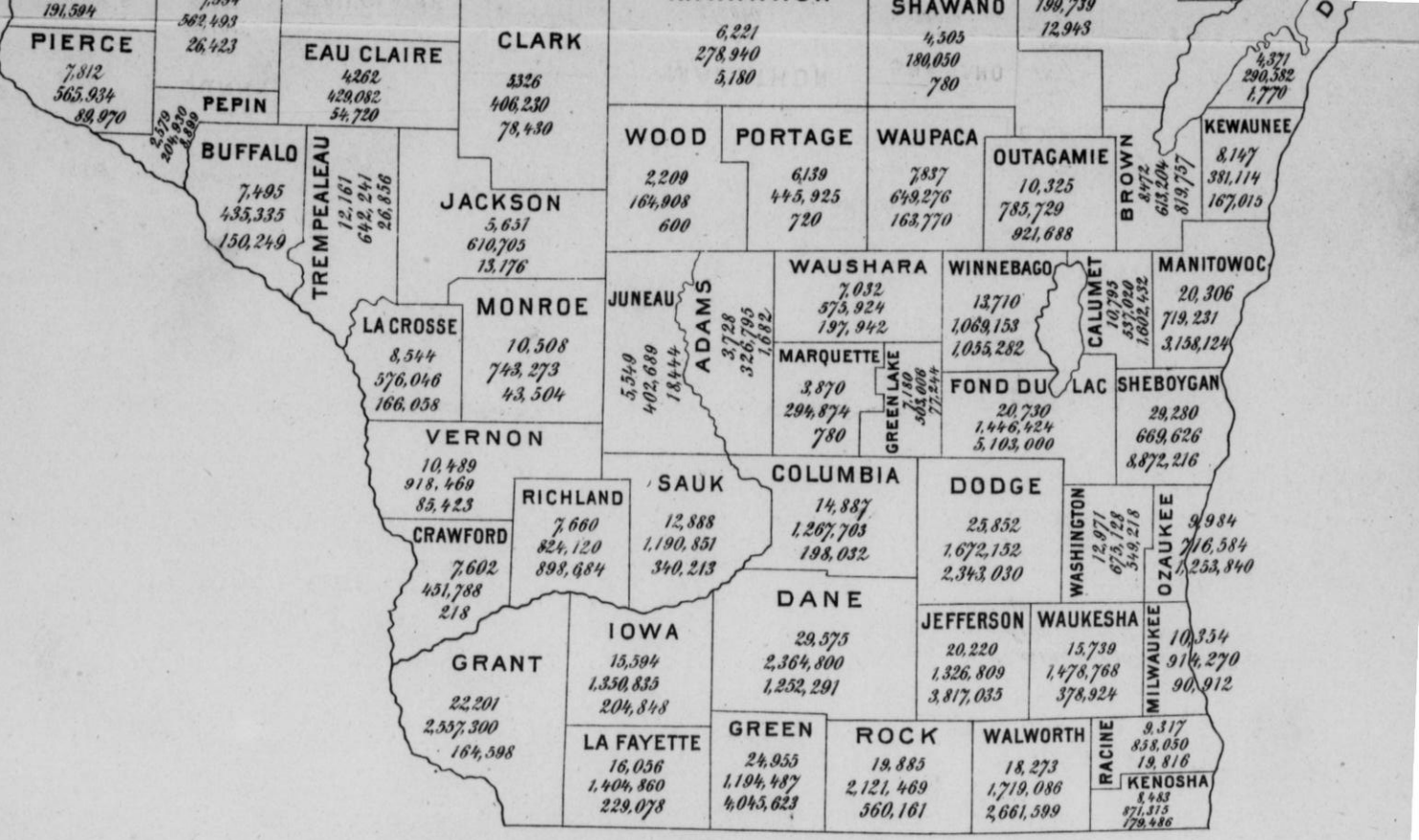
DAIRY MAP OF WISCONSIN 1887.

Showing the dairy products of the State by Counties.

1st Number of Milch Cows
2d " " Pounds of Butter.
3d " " " " Cheese.

Total Number of Milch Cows, 595,922.
" " " Pounds of Butter, 43,513,550.
" " " " " Cheese, 42,352,844.




PIERCE
7,812
565,934
89,970
PEPIN
2,379
204,930
1,899
EAU CLAIRE
4262
429,082
54,720
CLARK
5326
406,230
78,430
BUFFALO
7,495
435,335
150,249
TREMPEALEAU
12,161
642,241
26,356
JACKSON
5,651
610,705
13,176
LA CROSSE
8,544
576,046
166,038
MONROE
10,508
743,273
43,504
JUNEAU
5,549
402,689
18,444
ADAMS
3,728
326,795
1,682
WOOD
2,209
164,908
600
PORTAGE
6,139
445,925
720
WAUPACA
7837
649,276
163,770
OUTAGAMIE
10,325
785,729
921,688
BROWN
8472
613,204
813,737
KEWAUNEE
8,147
381,114
167,015
MANITOWOC
20,306
719,231
3,158,124
WAUSHARA
7,032
575,924
197,942
WINNEBAGO
13,710
1,069,153
1,055,282
CALUMET
10,795
537,020
1,602,432
MARQUETTE
3,870
294,874
780
GREEN LAKE
7,150
361,008
77,244
FOND DU LAC
20,730
1,446,424
5,103,000
SHEBOYGAN
29,280
669,626
8,872,216
VERNON
10,489
918,469
85,423
SAUK
12,888
1,190,851
340,213
COLUMBIA
14,887
1,267,703
198,032
DODGE
25,852
1,672,152
2,343,030
WASHINGTON
12,871
673,128
349,218
OZAUKEE
9,984
716,584
1,253,840
RICHLAND
7,660
824,120
898,684
CRAWFORD
7,602
451,788
218
DANE
29,575
2,364,800
1,252,291
JEFFERSON
20,220
1,326,809
3,817,035
WAUKESHA
15,739
1,478,768
378,924
MILWAUKEE
10,354
914,270
90,912
IOWA
15,594
1,350,835
204,848
GRANT
22,201
2,557,300
164,598
LA FAYETTE
16,056
1,404,360
229,078
GREEN
24,955
1,194,487
4,045,623
ROCK
19,885
2,121,469
560,161
WALWORTH
18,273
1,719,086
2,661,599
RACINE
9,317
858,050
19,816
KENOSHA
8,483
871,315
179,486