Fourteenth annual report of the Wisconsin Dairymen's Association : held at Richland Center, Wis., January 26, 27 and 28, 1886. Report of the proceedings, annual address of the president, and interesti...

Wisconsin Dairymen's Association
Madison, Wis.: Democrat Printing Company, State Printers, 1886

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FOURTEENTH ANNUAL REPORT

OF THE

WISCONSIN

DAIRYMEN'S ASSOCIATION,

HELD AT

RICHLAND CENTER, WIS., JANUARY 26, 27 AND 28, 1886.

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 PRINTING COMPANY, STATE PRINTERS.
1886.

OFFICE OF THE SECRETARY,

Wisconsin Dairymen's Association.

FORT ATKINSON, March 20, 1886.

To His Excellency, J. M. RUSK,

Governor of the State of Wisconsin:

I have the honor to submit the Fourteenth 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 Richland Center, Richland county.

Respectfully submitted,

D. W. CURTIS,

Secretary.

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OFFICERS 1886.

PRESIDENT.

W. H. MORRISON,

ELKHORN, WALWORTH 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.

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 1886.

A.

Adams, H. C., Madison.
Akey, L., Twin Bluffs.
Allen, H. B., Richland Center.
Allwood, E. A., Loyd.
Andrews & Burnap, Dubuque, Ia.
Arnold, L. B., Rochester, N. Y.
Alvord, H. E., Mountainville, N. Y.
Armsby, H. P., Madison.
Austin, Geo. A., Neillsville.

B.

Black, James A., Muscoda.
Brown, A. T., Kings Corners.
Brown, Wm., Sextonville.
Bills, A. E., Richland Center.
Beard, J. C., Muscoda.
Burnham, N. L., Bear Valley.
Brainard, L. C., Lone Rock.
Bancroft, J. C., Lone Rock.
Brainard, C. C., Dixon.
Beckwith, A. N. D., Lone Rock.
Brown, H. C., Woodstock.
Burnham, O. J., Richland Center.
Bennett, G. E., Richland Center.
Banor, W. C. S., Richland Center.
Bowin, W. J., Richland Center.
Bowin, F. P., Richland Center.
Bumes, T. S., Richland Center.
Brown, C. N., Richland Center.
Bailey, H. T., Richland Center.
Bunell, J. G., Richland Center.
Black, J. Q., Lone Rock.
Button, A. H., Lone Rock.
Bennett, J., Lone Rock.
Bellington, —, Lone Rock.
Brown, Walter, Sextonville.
Brag, E. H., Viola.
Buck, G., Muscoda.
Bull, Geo. W., Chicago, (Merchants' Dispatch.)
Bridgeman, Pat., Big Hollow.
Brace, C. E., Dixon.
Brainard, J. C., Dixon.
Bovee, John N., Richland Center.
Boyd, John, Chicago, 199 Lake st.
Beach, C. R., Whitewater.
Bush, Mrs. W. E., Sparta.

C.

Clark, J. H., Richland Center.
Curtis, T. D., Syracuse, N. Y.
Craig, R. B., Sun Prairie.
Cobb, B. B., Sun Prairie.
Campbell, —, Bellevue, Ia.
Cross, F. T., Mauston.
Carswell, G. J., Lone Rock.
Carswell, J. H., Lone Rock.
Cody, Wm., Lone Rock.
Collins, C. B., Lone Rock.
Crago, John, Richland Center.
Clark, H. J., Richland Center.
Cass, W. T., Ithaca.
Crumbecker, A. M., Richland Cen.
Carswell, T. E., Richland Center.
Carswell, Nathaniel, Lone Rock.
Chandler, Geo., Lone Rock.
Cushman, J. B., Viola.
Chadsey, Albert, Sharon.
Chadsey, Adison. Sharon.
Carswell, E. A., Mt. Sterling.
Crow, Willis, St. Nazianz.
Caswell, E., Ingersol, Canada.
Curtis, D. W., Fort Atkinson.

D.

Davis, Wm. T., Sheboygan.
Davis, C. W., Ithaca.
Dilly, N. E., Chicago, Union Line.
Dehart, J. L., West Lima.
Davis, Jacob, Ithaca.
Dixon, Wm., Dixon.
Dickenson, Wm., Pine Knob.
Downs, D. L., Richland Center.
Dosch, W. H., Richland Center.
Decker, A. J., Fond du Lac.

E.

Elston, A. C. V., Mequon.
Ellsworth, W. W., Dixon.
Eaton, H. L., Dixon.

F.

Fargo, F. B. & Co., Lake Mills.
Foster, L. W., Lone Rock.
Frednickson, Andrew, Spring Gr'n
Fiske, M. F., Twin Bluffs.
Fish, H. Z., Richland Center.
Fish. T. B., Richland Center.
Fargo, C. F., Richland Center.
Farnum, H. J., Ring's Corners.
Favill, Stephen, Delavan.
Fogo, W. M., Richland Center.

G.

German, John, Ithaca.
Glasier, H. W., Richland Center.
Glossell, L. H., Jefferson.
Greenhack, C., Bear Valley.
Gotham, M. W., Gotham.
Goodrich, L. D., Lone Rock.
Gould, John, Aurora, Ohio.

H.

Hagerty, J. H., Mt. Sterling.
Hamilton, J., Richland Center.
Hines, J. M., Woodstock.
Hoard, W. D., Fort Atkinson.
Hoak, Geo. O., Ithaca.
Hatch, A. L., Ithaca.
Hatch, C. A., Ithaca.
Hendricks, S., Buck Creek.
Hillman, Wm. J., Richland Center.
Hoskins, Dan., Richland Center.
Hart, T. M., Richland Center.
Harter, Andrew, Lone Rock.
Hull, J. L., Viola.
Hefner, S., Muscoda.
Hoener, M., Muscoda.
Harris, Geo. B., Spring Prairie.
Howard, J. B., Richland Center.
Hill, Wm., Richland Center.
Hanning, J. D., Richland Center.
Holcomb, A. L., Dixon.
Henry, W. A., Madison.
Harris, J. B., Antwerp, N. Y.

J.

Jenkins, J. H., Indianapolis, Ind.
Johnson, David, Hillsborough.
Joslin, Wm. H, Richland Center.
James, G. D., Richland Center.
Johnson, A., Cazenovia.
James, Mrs. D. G, Richland Center.
James, Norman L., Richland Cent'r

K.

Kimball, W., Union Center.
Knickerbocker, J. H., Palmyra.
Krauskop, Wm., Gotham.
Klinger, O., Richland Center.

L.

Loyd, T. A., Indianapolis, Ind.
Loomis, S. B., Lone Rock.
Lumensbush, F., Richland Center.
Looessy, Thomas, Spring Green.
Lincoln, Abel, Neptune.
Long, A. H., Richland Center.
Leybrand, J. W., Richland Center.
Leybrane, R. C., Richland Center.
Lee, A. C., Gotham.
Loomis, S. B, Lone Rock.
Loomis, H. K., Sheboygan Falls.
Lester, Chas., Orion.
Laton, Mrs. C. V., Lone Rock.

M.

Morrison, W. H., Madison.
Monrad, J. H., Chicago, Ill.,
17 Dearborn street.
Morton, G. J., Richland Center.
Miller, T. M., Muscoda.
Morgan, Dan, Spring Green.
Misslick, A., Reysville.
Miller, C. T., Gotham.
Maxwell, Josiah, Lone Rock.
McCollem, L. R., Twin Bluffs.
McCorkill, J. C, Twin Bluffs.
McKee, J. L, Richland Center.
McKee, R. N., Richland Center.
Murphy, Dan., Lloyd.
McCann, Isaac, Richland Center.
McCutchen, R. F., Whitewater.
Manghan, Michael, Edmond.

N.

Noies, W. H., Norway, Iowa.
Neefe, F. J., Muscoda.
Noies, J. H., Dixon.

O.

Oschner, A. L., Lone Rock.

P.

Philips, A. J., West Salem,
Pallar, Frank, Gotham.
Panks, H. M., Black Earth.
Payne, Chas., King's Corners.
Pickard, John, Richland Center.
Patter, Chas., Viola.
Parfery, A. C., Richland Center.

Q.

Quinn, D. J., Neptune.

R.

Robinson, D. C., Mauston.
Richards, Martin, Bear Valley.
Rodgers, J. A. C., Milwaukee.
Rizer, John, Boaz.
Reynolds, J., Lone Rock.
Rundecker, R., Viola.
Rowe, David, Lime Ridge.
Robertson, Mrs. E. S., Viroqua.

S.

Smith, Hiram, Sheboygan Falls.
Smith, John R., Lloyd.
Smith, Frank M., Ithaca.
Smith, J. A., Cedarburg.

Smith, J. M., Green Bay.
Sipper, Thomas, Richland Center.
Stow, W. D., Madison.
Senn, John, Fountain City.
Stoll, John J., Fountain City.
Schutz, Theodore, Rockbridge.
Sharp, James, Orion.
Staples, E., Sandusky.
Scholl, P., Richland Center.
Shaw, Wm., Lloyd.
Sippy, Frank, Neptune.
Sherman, Geo., Richland Center.
Smith, J. E., Lone Rock.
Southard, R., Dixon.
Salisbury, John, Neptune.
Scott, J. T., Richland Center.
Simmons, J. L., Viola.
Smith, E. M., Madison.

T.

Travers, Henry, Woodstock.
Turner, G. H., Sextonville.
Taylor, H. N., Lone Rock.
Teasher, John, Mt. Vernon.
Thomas, J. M., Lone Rock.
Turner, Frank, Richland Center.
Tracy, C. N., Bear Valley.
Thomas, J. M., Dixon.

W.

Warner, John, Ithaca.
Ward, J. E., Sandusky.
Waskins, J. W., Bear Valley.
Waterman, A. D., Bear Valley.
Wallis, John, Lone Rock.
Winterbum, B., Dixon.
Webley, J., Lone Rock.
Warner, J. P., Twin Bluffs.
Winn, J. S., Richland Center.
Ward, J. L., Sandusky.
Webber, M. C., Mt. Vernon.
Wagner, W. J., Viola.
Wait, Elmer, Sharon.
Waddell, W. A., Sextonville.
Wilson, J. C., Muscoda.

Y.

Young, Jacob, Muscoda.

FOURTEENTH ANNUAL MEETING

OF THE

WISCONSIN DAIRYMEN'S ASSOCIATION.

PROGRAMME.

TUESDAY, 9 A. M.

Entry of Butter and Cheese and articles for exhibition.
10:30.— Organization of Convention.
Address of Welcome by H. B. Allen, Richland Center.
Response by Hon. H. C. Adams, Madison.
Opening Address by President Morrison.
Appointment of Committees.
Report of Secretary and Treasurer.

TOPICS.

"Successful Dairy Farming is Dependent on three R's, R's, R's—Rich Thinking, Rich Soil, Rich Feeding."—Hon. Hiram Smith, Sheboygan Falls, Wis.

An epitome of experience from a man who took a primitive farm in the woods of Wisconsin and has brought it to a degree of fertility capable of supporting one hundred cows on two hundred acres.

"Dairying — The State of the Art."—Prof. L. B. Arnold, Rochester, N. Y.

No man in the United States is better versed in all that pertains to dairy science and practice than Prof. Arnold.

"The Value of Cornstalks for Producing Milk and Butter."—Prof. W. A. Henry, of the Wisconsin Experimental Farm, Madison, Wis.

A contribution of practical knowledge that any farmer of good sense can understand and safely adopt.

"What's a Cow For?"—W. D. Hoard, President Northwestern Dairymen's Association.

This subject underlies the whole business of dairying, and is of the greatest importance to the dairy farmer.

"Why we Churn, and How."—Maj. H. E. Alvord, Houghton Farm, Mountainville, N. Y.

Maj. Alvord is one of the advanced Dairy Thinkers and Demonstrators of the Age, and he never fails to greatly interest and instruct.

"Does Rich Food Enrich the Cow's Milk?"—H. P. Armsby, Ph. D., Professor of Agricultural Chemistry, University of Wisconsin.

Prof. Armsby is doing valuable work for the substantial advancement of Agriculture in Wisconsin, and his treatment of this vexed question will prove of deep interest.

"Dairying in Hard Times."—John Gould, Esq., Aurora, Ohio.

Mr. Gould is one of the clearest of American writers on Dairy questions, and his contributions never fail to interest and profit.

"The Factory Necessity of Good Milk.—What shall be done with the Man who does not Deliver it?"—J. A. Smith, Dairy Editor of the *Cedarburg News*.

Mr. Smith is one of the most thorough cheese makers in the West. What he says will be based on what he knows.

"Dairying on the Farm."—Geo. A. Austin, Neilsville, Wis.

Mr. Austin is a maker of fine butter. It would prove a great blessing to the state if the makers of so much wretched "Country Store" butter would give him an attentive hearing.

"Six Years at Home and Abroad as a Cheese Instructor."—J. B. Harris, Antwerp, N. Y.

"Dairying From a Woman's Standpoint."—Mrs. E. S. Robertson, Viroqua Wis.

Some of the most successful managers of Dairy Farms in Wisconsin are Women, and Mrs. Robertson is a notable example of such success.

"Work."—Mrs. C. V. Laton, Lone Rock, Wis.

The importance of the subject and the well assured talent of the essayist will prove a combination that will interest all.

"Amusements."—Mrs. D. G. James, Richland Center, Wis.

The necessity of more oil and less vinegar on the machinery of Dairy labor is well appreciated by all.

"The Value of Red Clover as Feed for Hogs and Cattle."—S. Favi'le, Delavan, Wis.

A practical paper on an intensely practical subject by a man who "Knows how it is himself."

"How Shall We Improve Wisconsin Cheese."—A. J. Decker, Fond du du Lac, Wis.

This is a question that ought to bring every Cheese Maker and Cheese Factoryman in the State to the Convention.

"Dairy Cows and Their Management."—Fred E. Carswell, Bear Valley, Wis.

The Dairy Cow has in Mr. Carswell an intelligent and discriminating friend on whom she has generously bestowed large success.

"The Feed and The Cow."—Hon. H. C. Adams, Madison, Wis.

Mr. Adams is one of the representative Young Farmers of the State whose thorough work with his animals is a guarantee of an intelligent presentation of this important subject.

"Dairying of Yesterday and To-Day."—S. B. Loomis, Lone Rock, Wis.

Mr. Loomis is one of the venerable "back numbers" in cheese making who has also not forgotten this is the year of our Lord, 1886.

"What is a Fair Return per year for a Good Cow, and Can we Afford to Keep any other?"—C. R. Beach, Whitewater, Wis.

This topic will be treated by one of the most thorough managers of the Dairy Cow and Dairy Farm in Wisconsin. Farmers who do not care whether they make any money from their cows or not, will probably feel more contented if they do not hear him.

"Odds and Ends in Dairying."—J. M. Thomas, Dixon.

All papers read before the Convention will be limited to one thousand words. The zest and profit of a 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 audience as required but not in the order named.

Ten dollars will be given for the best essay of 250 words on the method of making granular butter.

WEDNESDAY EVENING.

Grand dairy banquet and sociable. The banquets of this association have become famous for a flow of wit, song and story.

PREMIUMS OFFERED ON 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, Chedder or Flat	10 00
Second best	5 00

The Association will exhibit two cheese from Ontario, Canada, one cheese from New York, and some fine cheese from Wisconsin. Factorymen are earnestly requested to bring a cheese and learn by comparison.

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, Centerville, 1882; Marr & Dyer, Whitewater, 1883; E. P. Ingalls, Milford, 1884, and H. Z. Fish, Richland Center, 1885.

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.

Richland Center is the county seat of Richland county, and is 59 miles west of Madison, on a branch of the C. M. & St. Paul Railway. Trains leave Madison at 8:50 A. M., and 7:00 P. M., change cars at Lone Rock for Richland Center.

As the convention promises to be well attended, parties desiring to secure lodgings or hotel accommodations, should address H. Z. Fish, Richland Center.

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

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

TRANSACTIONS,

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS,

OF THE

WISCONSIN DAIRYMEN'S ASSOCIATION,

AT THEIR

FOURTEENTH ANNUAL CONVENTION.

Held at Richland Center, Wisconsin, January 26th, 27th, 28th, 1886.

The fourteenth annual convention of the Wisconsin Dairymen's Association convened at Bailey's Hall, in Richland Center, Tuesday, January 26th, at 10:30 A. M., President Morrison in the chair.

Mr. Hiram Smith being called for, addressed the convention as follows:

Mr. President and Gentlemen—I think the members of the Dairymen's Association of Wisconsin may congratulate themselves upon the progress that has been made in the last fourteen years. I recollect the first annual meeting was held in the city of Watertown in this state, and there was less than a quarter of the number that are now present; but our views of dairying then were as small as our audience. Our main object was to learn how to make as good cheese as they made in the Western Reserve, for they were supplying the markets of Wisconsin, and we wanted to drive them out, and supply our home market. That was our highest object in organizing such an association.

After we had succeeded in that, another element came in; then our object was to make cheese as good as New York cheese, and we succeeded so well that it was a common thing for Chicago buyers to buy Wisconsin cheese and brand

it "Excelsior Factory, New York." We were pretty well satisfied with that. Still we had no great object in view. We never took into account that it was necessary to prepare our land properly, enrich the soil, so as to produce more milk, and keep more cows. The matter of breeds of cows had not come across our vision. We took what was driven up from Illinois, and did the best we could with them. The progress of the dairy interest in the state of Wisconsin came along by individual steps. Every year brought some obstacle to overcome, in order to increase our capacity to carry on dairying successfully.

The topics we discussed in our early assemblies would be smiled at now, but they were perhaps as elevated as we were prepared to meet. I recollect a topic that was discussed with some enthusiasm, namely, the best method of getting cows into the stable. It now looks like a pretty small topic, but I think it took an hour to discuss that question, and after we had all got through, and a good many plans recommended; amongst others, dogs, as the best method of getting them in; a few said a horse was better; one man volunteered the remark that a fish-pole with a prod in the end would accomplish the object; after the subject seemed somewhat exhausted, a little old man got up and stuttered out: "Gentlemen, it is easy enough to get cows in the stable, if you begin at the right end of the cow. If you will put two quarts of ground feed where you want the cow to go, you won't want dogs, horses nor prods." It was a whole sermon in a paragraph, and it opened my eyes a little about the way to treat a cow.

Now, we have to discuss finer points; in the first place we see the necessity of enriching the soil. That would seem to be a pretty plain proposition. We all know that rich land produces better crops than poor land, but we still need to learn how to make a cow cheaply enrich the soil. We find, upon investigation and a great many trials, that the soil can be enriched more cheaply by enriching the fertilizers we use; that is, we have found that by feeding bran, middlings, and oil meal and taking manure directly from the stable to where we wish to raise corn, the following year,

we are surprised at the growth of the corn, and we can trace it back directly to the ground feed which we feed our cows, and I believe it is pretty well established and indorsed by chemical agriculture that the manurial value of any ground feed is but very slightly diminished by passing through the cow; therefore, if this is correct we get two values out of the bran and oil meal and other feeds that we give to our cows. We get its feeding value first and direct, every week we feed it. Then we get its manurial value again, in enriching the fertilizers we have to place upon our land. We have two feeding values, either of which, experience is rapidly proving, is equal to the cost of the original feed. When we realize this, it will be a great starting point for progress in dairying, for without a rich soil, no branch of agriculture can flourish to the benefit of the man that owns it, and this is more necessary with the dairy farmer than with the grain farmer, because a diminished crop in the grain farm is the loss of only what is diminished, but with the dairyman, with his full stock of cattle, he not only loses the crop, but he must go and buy some other man's crop to carry him through. He has a larger investment also in proportion to his acres. On a well stocked dairy farm there is more capital invested, and therefore there is more necessity that everything shall contribute to pay a fair per cent. for the capital invested.

Having got this point settled in our minds, the necessity of enriching the soil and a knowledge of how most cheaply to do it, is a good start for any dairyman, young or old, and having reached this point, the question arises in regard to feeding the cattle. Now, a dairyman should make it a study to find out by what system he can carry on his farm so as to increase the supply of milk without increasing his capital or amount of land. He will find, if he investigates, that fine grass grows very slowly in a dry season, and if his cows are confined to the pasture, the short grass scarcely has an opportunity to gather sunlight, which makes all things grow; that it grows very slowly, and his cattle become pinched for want of feed, if he has not prepared other feed, such as early rye, winter rye, millet, or fodder corn. If he

has these in sufficient quantities he feels a sort of independence, and that a few weeks of drought are not going to materially affect him, his cows are not going to fall off one half in their milk, but will keep up right along. After he has learned this, he has learned a most important lesson. He will find out that the grass grows much more abundantly if it can grow to maturity, and can be cut into hay and fed to the cow in the barn, for when a cow goes out in the field, she goes more for exercise and comfort than to hunt from morning till evening for a scanty existence. After he has learned this well he will come to the conclusion, as many other dairymen have in this state, that his best grass is the dearest feed his cow eats during the year, and he cannot afford to furnish it at $60 or $70 an acre, and devote from four or five acres to feeding a cow during the summer; but, if he can keep it on one-quarter of that with a little additional labor, the cow will show greater profit to the dairyman.

Again, it seems that we are as farmers a great while in discovering what is so very plain—that to get the most money from a cow, the cow should give the most milk when prices are highest. Why not? Who can give any reason why it is not just merely common sense that a cow should give the most milk while the prices of butter and cheese are the highest? It looks like a very plain proposition, but it is true that a large proportion of the dairymen of the state of Wisconsin get their largest flow of milk in June, when nobody wants to buy the product. They cannot ship to warm countries where they find good markets at this season of the year, and when this season of the year arrives and butter is worth thirty-eight and forty cents instead of twelve, thirteen and fourteen cents, as it was in the summer, they have no butter to sell. Why not reverse it? The cow gives more milk in the year, she lives on just as little feed and at the time she naturally goes dry when coming in; in the spring she has green feed, and therefore the flow of milk keeps up much longer than in December and January.

Another point that has been urged, and with a good deal

of force, and there is money value in it, is to make the stables warm, by putting in either a double thickness of building paper or saw dust, or in some way to keep the frost out of the barn. No dairyman can afford the expense of frost; it is dearer than oyster suppers, and the theatre. Better attend the theatre and have some fun out of it than to pay the expense of having frost in the stable.

We may congratulate ourselves that these ideas are brought to us in this later day. It seems as if we ought to have thought about these plain matters of fact before, just as we wonder why somebody didn't think of the telephone years ago; but we had other objects in view and we run along as children do, and have got to a place at last where we can begin to learn something that is really useful.

I am glad of the able dairy authority that will be present with us during this occasion. Perhaps there has never been a dairy meeting held anywhere in the United States that had present more acknowledged talent than will be on this occasion to address us during the convention to be held here for three days; some that have spent the best years of their lives in this way. Our venerable friend, Professor Arnold, towards whom every dairyman should feel with the greatest gratitude, that he has spent the best years of his life without regard to profit to himself, and worked out these difficult propositions that will be a lasting benefit to the dairymen of this and every other country. Others will also follow in the discussions, and we shall receive substantial benefit during this convention.

The President—I can endorse everything that Mr. Smith has said with reference to the talent that the association has provided for this meeting at Richland Center. Certainly never before in the history of this association has there been present such an array of dairy talent as will be at this meeting. Mr. Arnold, with a life long record of exertions in the scientific branches of dairying, Mr. J. B. Harris, with his ripe experience, Major Alvord and Mr. T. D. Curtis, who is familiar with everything in Wisconsin; and with our vast array of talent from our own state, it appears to me that

we will be able to touch upon every subject that will be presented in reference to dairying.

We have received a great many compliments in reference to our reports, and I do not think there is another association that has been so thoroughly united, so harmonious in all the years of its existence, as the Wisconsin Dairymen's Association, and that is one reason why we have accomplished so much. Look at what was accomplished at New Orleans last winter. It was because Wisconsin had the best dairy exhibits and was united. We worked as one man. I believe we are going to have a great success in this convention, and our experience will be what it has been at the sixteen farmers' institutes that have been held this winter, that when we come to the third day we shall yet want one day more to complete our work.

I now take great pleasure in introducing to you for a few moments' talk, Professor Arnold, of New York, who has a world wide reputation as a scientific and practical dairyman.

Prof. L. B. Arnold — *Mr. Chairman and Gentlemen of the Convention:* I thank you very much for the high compliments you have paid me this morning, and it may be partially true, but you must remember there are always two sides to a question. There are others who consider me nothing but a visionary old theorist, and do not accept what I say to them. I shall be very glad indeed if you can appreciate and will accord with me in what I may have to offer. It is always gratifying to have others see things as we do. If you had had the kicks and thumps and hard knocks that I have for the last eight or nine years, you would understand how well I can appreciate these kind remarks of yours.

I hardly know in what direction to talk to you, whether I shall give you something of the changes which occur in the process of cheese making, or whether I shall take up some other subject.

Mr. Hiram Smith — I think we shall be very glad to hear about cheese.

Prof. Arnold — Well, that has been a bone of contention. The business of cheese making is but yet in its infancy. We know but very little about it, scientifically or otherwise, other than as a traditional matter, but we have gained some facts which are of quite a little importance. We know now what we did not know at the beginning, that rennet has something to do in the making of cheese, that it has a special office to perform. I don't know that I ever knew anybody that knew what the office of rennet was in cheese making. The best of us, so far as my information went, thought that, on account of a little acid it contained, it curdled the milk and that was all we wanted it to do, and to get the whey out of it, and then, somehow or other, the cheese took care of itself and became a distinct article; and it has often been the subject for discussion that if we could get some agent that would curdle the milk, instead of rennet, that would be cheaper, it would be a boon to the dairy interest. But after studying the thing for some time, I finally ascertained that it was the rennet that did the whole business of making the cheese. It not only curdled the milk, but remaining in the cheese, it exercised a sort of digestive power, under the influence of which the peculiar flavor of cheese was developed, and the hard structure of the first insoluble curd was broken down to a soft digested cheese, and we finished the digestion when we put it into our stomachs. The great benefit of rennet, therefore, in making cheese, was to begin the work of digestion and carry it on to a certain degree, then cool the curd down and stop the rapid action of the gastric juice, and hold it there until we could sell or consume it. That was the great secret of the action of rennet, and we could not substitute anything else in the place of it. I very thoroughly tested the idea that it was not acid that made the cheese.

Prof. Englehardt made some very striking experiments on that that demonstrated that acid would not make cheese under any circumstances. He took a sample of curd made with acid, and another sample of curd made with rennet, and when they got to a certain consistency put them both into bottles, corked them up, and set them away in the labor-

atory for three months at a temperature at about 67 degrees, let them stay there to see what the results would be. When they had been there about thirteen weeks he opened and examined them. I think he used muriatic acid, or I don't know but it was lactic, I cannot be positive about that. He found that the one with the acid in it had remained just as it was when it went into the bottle. Had not altered a particle. It was an insoluble curd, just as it was when he put it in. The other had been converted into an almost soluble cheese, with but a very trifle of cheese flavor, because it had no air from which to derive flavor. I had reached this conclusion by observation and experiment long before these experiments were made. I found that, undertaking to dissolve two cheeses, one made under the acid process and the other made without the acid, just as weak an acid as I could get it, the one in which the acid was allowed to exercise its full natural influence was very much more digestible and soluble than the other. That the acid stopped the work of digestion, but it made it hard, and that was the service it really performed, to harden the cheese. It never made a particle of cheese in the world, and I have been laboring for the last ten years to impress these facts upon the dairy public, but I have found lots of people, even since I came up here, that say they cannot make cheese without acid. It is all bosh. It can be done. More than ninety-nine one-hundredths of the cheese in the world is made without employing acid in any way. On the contrary, it is kept out of the way as far as possible. Only in our American process and in the English cheddar is acid used in cheese making, excepts our cheese, something like hot cheese, and some varieties of Italian cheese.

All the best cheeses of the world are made on the sweet process. The Gruyere is perhaps the best cheese, all things considered in the world. It has taken more prizes at world's fairs than any other, and it is more generally accepted. The Roquefort cheese, which is made in those caves in France, and is noted for its choice flavor. It is all made sweet, and the flavor is developed by putting it in the caves. Those samples of Dutch cheese that keep so long and are so hard, are

all made sweet. All the varieties of English and French cheese that I know about are made sweet. It is only our particular mode of manufacture where we are attempting to ship it across the ocean, and must have a very firm, hard cheese, that we have been in the habit of using acid, and it is actually ruining the inherent qualities of the cheese.

If you allow your curd to lie in the whey until the whey becomes sour it produces a new class of changes in the curd, one of which is that it absorbs out a considerable portion of the mineral matter in the curd, particularly the phosphates, which are very important. It absorbs them out and leaves the curd in an insoluble condition, which makes it an imperfect food, because we need all of that mineral matter, and must have it in our food in some shape. Another peculiar effect is that when the curd is subjected to the action of acid it makes a very rapid separation of the moisture from the curd. We want to get away a certain amount of the moisture, or our cheese is too soft. We cannot handle it, and if the acid helped to do that, and its influence ended there, it would be well enough, but there is this difference between the action of rennet and the action of acid in that particular. The acid separates the moisture and leaves it almost in a mechanical mixture with the curd, whereas, the rennet when it separates it, only carries that process to a certain extent, and its action combines the water with the curd.

There is always a point in the action of curing cheese when the water, which was before being separated chemically combined with the curd, and remains in the curd. That combination never takes place where the action of acid prevails. The water remains mechanically mixed, and you take a cheese and cut it, that has been made on the acid plan, and allowed to remain in the whey until it becomes soaked, and the whey has become decidedly acid, that cheese will dry right up, because the water is all free. But, if you cut a cheese that is made under the influence of rennet, the water that is in the cheese will combine chemically with the casein, and it is pretty hard to get it out. It remains moist a long while after it is cut. You cannot have a good

cheese without moisture. You want water, and you want fat, and you want casein in just about equal proportions, and if you don't have it you don't get good cheese.

It is a curious circumstance that digestion is a simple process of hydration. I mean by that, a chemical combination of the substance with water. We digest food simply by so changing the constituents of the food that they will lose their affinity with each other and combine with water. We can make a cheese so that it will digest itself into a perfect chyme, and become a liquid, and it is not impossible that some day we will have our cheese in tubs and pails instead of in boxes. If we take a certain amount of pepsine and a certain amount of water and cheese, and place them together at the temperature of the stomach, that cheese dissolves into a clear, transparent liquid which we call chyme, and that is just what takes place in that kind of cheese.

In the French Debrie cheese, naturally a soft cheese, to give it a proper kind of ripening, they take a barrel that is a little larger than the cheese, and put some straw in the bottom, then lay a thin cheese, then a coat of straw and another cheese, and so on until they get it full. Then they shut that up tight, and let it stay there to cure. The action of the rennet digests that cheese into a liquid, very frequently so it will run out at the bottom, and they catch it, and save it to use, and when they examine the inside there will be a rind formed by the drying curd and inside of that will be the consistency of honey and it makes a very delicate dish.

Mr. J. A. Smith — What proportion of the cheese of the world, made without acidity, are full cream?

Answer — Oh, they are almost all. All the cheese made in the old country are not full cream.

Mr. Curtis — By saying cheese is made sweet, you don't mean that there is no acid in it, you mean they get the whey out before it is sour?

Answer — Yes, that is all.

Question — What is the effect of lactic acid finally developing in the curd, in good cheese?

Answer — Oh, it don't amount to anything.

Question — What does it come to?

Answer — If there is moisture enough, by the action of lactic acid, it will be converted into alcohol, and from alcohol into vinegar, and the vinegar finally is decomposed by the action of the air, and is burned up — disperses.

Question — Does that carry the moisture that should remain in the cheese with it?

Answer — It certainly does, because in the first place the moisture is mechanically held, instead of being chemically combined as when we use rennet only, and being free in there it dries out very rapidly, and if it don't dry it will drain out and your cheese will leak.

Question — If you leave a curd to acquire acidity enough to string on a hot iron half an inch, would there be a loss of phosphates?

Answer — There would, long before that. Take a curd that will string a quarter of an inch, and you lose about fifty-eight per cent. of the phospates that are in it.

Question — Suppose it was out of the whey and the same acidity developed in the curd, would the phosphates then be lost?

Answer — No, sir; they would remain there, but they will finally go back to the same condition — re-combine.

Question — You claim it must have no acid at all before it goes to the press?

Answer — No, I don't say that; but don't let it lie in liquid acid. Get it out of the whey before it is sour. After it is out of the whey you may sour it as much as you are a mind to. You can't hurt it then.

Question — Would you salt your curd before the acid developed in they whey or wait until after?

Answer — It is immaterial. You know the cheese goes right on and cures, no matter about its being salted.

Question — In salting the curd when it is sweet it checks the development of the acid, so you have to hold it longer before it is in the right condition to go in the press?

Answer — Yes, sir.

Question — Then your sweet curd process is simply sweet whey; the curd is just as you always have it?

Answer — Just the same.

Question — Then, it is the acid in the whey that is to be avoided, and not the acid in the curd?

Answer — Yes, that is it; as long as it is in the whey, keep it sweet, and after it is out of the whey keep it warm instead of cold. Most every body in commencing to make cheese this way, would invariably cool their cheese right down, which you must not do.

Question — In manufacturing cheese in the summer time, when we want to hold it, how would you manufacture it so it would retain its solidity and flavor?

Answer — Salt it a little higher.

Question — Wouldn't you develope a little more acid on the curd before you salt it?

Answer — Yes, I would ripen the curd a little more and salt it a little more.

Question — By scalding a little higher, would it make a dryer, firmer cheese?

Answer — If you keep it warm longer, if you scald at a hundred and twenty the cheese would be softer than if you scald at ninety.

Question — How high would you scald your cheese in summer, if you want to hold it some time?

Answer — Never over 98. I never found any difference in the tests I made between 95 and 100, as to the action of the rennet. The whey wont separate so fast by scalding at 110 or 120 unless it is sour, as it will at 100 or 95. Rennet is never so efficacious as at from 98 to 100.

Question — If you want cheese to ripen early, to come into market, would you scald it to 110?

Answer — No, sir; I would use a little more rennet, but not a great deal, because if you do the cheese, as soon as it gets ripe, runs its force very quick; also, a certain amount of rennet produces a good flavor, while more hurts it.

Convention adjourned to meet at 1:30 P. M., same day.

AFTERNOON SESSION.

Convention met persuant to adjournment at 1:30 P. M.

ADDRESS OF WELCOME.

BY H. B. ALLEN, Richland Center.

Mr. President, Members of the Association, Ladies and Gentlemen—Through the ballot, and on behalf of the citizens of this village, it has become my pleasant duty to extend you our hearty welcome. Not a pleasant duty because of my fitness to occupy the position of speaker—far from it—but because I feel that we have common needs. It should be a source of pride to any community to have the privilege of affirming its hospitality to so distinguished a body as is the Wisconsin Dairymen's Association. Though you are a child of but thirteen summers, yet you are scattering your permanent blessings throughout the state and exerting an influence even beyond its borders. Nothing, save pressing needs, could have increased your membership from eight to four hundred in the brief period since your first meeting at Watertown.

Nothing but success can have attended your efforts when our state shows during the last decade an increased annual production of over $1,000,000. Our dairymen need no higher commendation than a comparison of the records of 1872 and 1884, for during the one their productions were $1,000,000, while during the other they were $20,000,000.

What means this rapid progress unless it be the adaptability of our state to the butter and cheese interests, and the earnestness and ability on the part of those engaged in its manufacture. These two essential factors have certainly united and achieved many unlooked for results.

When we consider that less than a century ago the entire production of cheese in the United States was 114,734 pounds while in 1877 it reached 300,000,000 pounds, and that Wisconsin alone made 33,478,000 pounds of cheese and 36,240,000 of butter. That fifteen years ago there were only 1,313 cheese factories in the United States, of which Wisconsin had 54. That as late as 1830 most of the butter and cheese was made in the homes of our farmers, and the supply was

limited to local demands. While to-day the world is our market, and our only successful competitors are Australia and Canada.

We have just cause for feeling grateful for our progress as a nation and as a state.

An interest in this branch of agriculture was first awakened in New England, but rapidly extended westward, being carried on very successfully by New York, Pennsylvania, Ohio and Illinois.

Wisconsin in an opportune time, and in the right way, placed herself as early as 1850 as the fourth state in the number of her factories.

You and those whose desires you represent and foster, have been quick to see our possibilities, and so wisely have these been directed that our dairy products have entered into successful competition with our sister states, though they have had longer and wider experience than we. Our brands are well known and highly prized in our largest cities.

Our competition at the New Orleans World's Exposition was not so much a source of satisfaction because of the $3,372 awarded us, out of the $10,000 in premiums there offered, but because this state has men of such experience and determination.

It is a matter of vast importance to us that we have such ability in our colleges and on the farm, in our factories and behind the counters, for in any great enterprise, be it what it may, science, theory, practice and exchange must go hand in hand. Any undertaking in which *mind*, *heart* and *muscle* do not unite must from necessity fail.

By extending to you an invitation to assemble here we have reasons to believe that there will be mutual benefits.

We as a county and a village feel that you have for us the results of experience and practice, and that you are ready and willing to bestow these upon all anxious recipients, and such I am sure you will find our people.

Some of our farmers many years since, caught the spirit of the dairy business, and with credit to themselves and to

our county and to the state, they have done much to develop the resources of this part of the state.

Through their efforts many families are prosperous and many acres of land that would otherwise have been nearly valueless have yielded quick cash profits.

It is justly a source of pride to Richland county to have among her citizens some of the oldest and most enthusiastic dairymen of the state, those who are alive to all the modern improvements in the manufacture of butter and cheese; those who are aiming to keep this county abreast in this important enterprise.

From these I can bespeak for you a most cordial support and earnest attention. They are anxious to receive from you new ideas, new inspiration, and are ready to co-operate with you in advancing this important industry.

I hope our people will be able to respond liberally to your call for memberships, and that you will be instrumental in impressing upon many more of our farmers the need of better stock more improved appliances, and a more thorough understanding of the dairy business. This and the surrounding counties seem by nature to be well adapted to the dairy interest; the hills and valleys alike furnish good pasturage of native grasses and yield abundantly the clovers and other important tame grasses.

Nature has prepared the land and it now remains for you to impress upon us the advisability of engaging in that line of agriculture that will add to the richness of the soil instead of depleting it and at the same time be of greater financial benefit. It is for you to encourage more to engage in that industry which is in the very front ranks among the industries of the world.

You have before you many important problems, some of which may be old to many but to others new. Some are the results of this year's experiments and will be exceedingly interesting to all. Some will be results of practical tests in various parts of the state and which are the results of previously discussed theories, thus indicating how closely you have harmonized theory and practice.

I sincerely hope that your pleasure in meeting with us will be as abundant as the welcome we extend to you.

And I hope if there is anything overlooked on our part that you will be as free to indicate that omission as we shall be to supply it.

Hoping that your meeting will be pleasant and profitable and a bright spot in the memory of your association. I bid you welcome.

RESPONSE TO THE ADDRESS OF WELCOME.

By HON. H. C. ADAMS, Madison.

Mr. President, Ladies and Gentlemen—The members of the Wisconsin Dairymen's Association think they know good cream when they see it, and I can assure you that we can appreciate the greeting which we have received, as the genuine cream of hospitality which has arisen upon the human kindness, and which has been offered to us in the golden goblet of good fellowship, lined with the silver of intelligence and thought.

The dairymen of Wisconsin have met for a practical purpose. They are not here simply to have a good time; they are not here to uphold imposibilities; they are not here to ridicule or antagonize other branches of farming industry. They are not here to declare the purity and wisdom of their own business methods, but they are here to improve those methods by contact and association of ideas. We are here to find out more about the calf and the cow, the churn and the cheese, the butter, the milk and the cream. We are here to study together all those questions relating to the growth and production of grasses and grain. We are here to make sight drafts upon each other's knowledge for information about all those matters which relate to the business of dairying; and we are here in part to devise, if we can, some means whereby the fraudulent butterine may be stamped out by the iron foot of the law.

Dairying has revolutionized in part the agriculture of this state. It has restored the soil that had been robbed of its

fertility by the continued piracy of grain growing. It has made a home market for the products of the farm, so quickly produced, so quick to sell. It has poured currents of new wealth into the state which are seen all over the dairy districts in better fences, larger barns, in better homes, more productive fields, the homes made beautiful by those adornments which wealth alone can give, and the practical element of this industry is found in the increased value which is shown in the land in the dairy district of the state as compared with other farming lands.

Now, then, to sustain and develope these industries this Association was organized, and I wish to say right here that to these men, like Hiram Smith, J. A. Smith, Stephen Faville, W. D. Hoard, C. R. Beach, Chester Hazen and others who have stood by this Association through all these years, the people of the state owe a debt of gratitude that cannot be repaid. No coterie of politicians in all Wisconsin's history has served the state so efficiently and well as these men have served it. Their memories will not be graven in law, or upon lofty monuments, but they will rise all over the state in prosperous homes and educated children.

The reception which we have received here to-day, grand as it is, is a tribute to the work these men have done to our state. By their fruits shall ye know them.

I once read a legend that has come down from the misty middle ages, that at one time there was builded a church in one of the cities of central Europe, and the people of the place desiring that each one should have a part in completing the structure arranged that a bell should be cast from contributions of metal, which all the people were called upon to give, and the prince brought his rich ornaments, and the peasant his rude implements of toil, and the lady brought her chains and her bracelets, and the widow gave her little mite, and even the beggar gave his sorely needed offering, and when the offerings had all been carried and the cast had been made, the great bell was hung in the tower of the cathedral, and as it rang out its first notes of welcome all people were stirred, for it had a melody of tone never

heard before. It was a melody strong with the strength of courage, tremulous with the inspiration of youth, tender with human love, rich with human charity, glorious with human sacrifice.

So in associations of men like this desirous for the development of a people and the upbuilding of a state, let us, each one of us, in perfect sincerity, contribute each our portion, be it great or small, and our work shall stand a living and a speaking monument of our friendship and our wisdom.

Now, then, to the people of Richland county and this town, to them I say in behalf of this Association, I again return our thanks for the greeting which has been given us, and we members of the Association can certainly feel assured that if, during the three days' churning of ideas which is to go on here, we do not get our full yield of the butter of truth it will not be on account of any deficiency in the temperature of the local atmosphere.

Mr. Stephen Faville was called to the chair.

ANNUAL ADDRESS BY PRESIDENT MORRISON.

Ladies and Gentlemen—This Association has been for many years a traveling farmers' institute, holding its annual convention in different parts of the state, and its reports are a compendium of success and beneficence to the dairymen of the state. The pioneer, the wheat farmer of Wisconsin, has not, as a rule, taken readily to dairying. The one was merely mechanical, the other requires thought, observation, intelligence, more brains. To meet this emergency, which circumstances have thrust upon our farmers, there is a positive demand for practical knowledge. The dairyman who puts only his muscle into his various dairy operations will be greatly surprised at the success of his better-educated neighbor who enjoys more of life's comforts, works less, but puts more dollars into his pockets. The one understands his vocation just as his father did before him, the other says: "My farm-

ing or dairying is a business; it is my profession; to pay me it must be conducted as a business, and like all other kinds of business, I must put my knowledge and part of myself into it."

The dairyman who will make himself master of his vocation, put himself into the current of dairy thought and literature, apply business principles to his vocation, read, think, study, and apply, will have the secrets of dairying unfolded to his view, which will lead to a life full of all that constitutes success, both mentally and financially.

To prosecute a business successfully depends largely upon how well we understand it. Dairying in the past has been largely formative, but it is emerging from guess-work, and entering upon methods founded upon positive knowledge and scientific facts.

In the preparation of this annual address, or rather familiar talk, I shall not weary you by the oft-repeated dairy statistics, that he who reads must know, but will at this time direct your attention to some questions of vital importance to all dairymen. Prominent among these is adulteration or bogus butter. The first question is, to what extent has this adulteration reached? Possibly 250,000,000 pounds, about one-fourth of our entire dairy prodnct. Nearly every state in the north has from 10 to 100 factories turning out bogus butter, and every factory making this imitation butter furnishes a food-product equal to at least fifteen cows. Now the serious matter that confronts us is this: Granting that one-fourth of the butter offered upon the market is bogus or imitation, can the dairy industry stand this competion? If 50 pounds out of every 100 pounds of genuine dairy butter was made as well as 25 pounds out of 100 pounds now is, would not the increased demand for butter keep ahead of the displacement that now goes on by the consumer preferring good butterine for the poorer grades of dairy butter?

It is a know fact that from 1860 to 1870 the number of cows to every 100 inhabitants was 27; from 1870 to 1880 the proportion has fallen to 23 cows to every 100 people, and it is now estimated that only 20 actual dairy cows exist for

every 100 people. Still, by the improvement of butter-making processes during this period the consumption has increased from 17 pounds to 27½ pounds *per capita*. Now, if we reason a little, it will be shown that the displacement of cows by bogus butter has not been so great after all; for if we figure the cows by the ratio of population, and the increase of butter consumption during this period, the bogus butter supply has really only been sufficient to make good this shortage on butter, unless better cows have made good this deficiency.

The great injustice arises from the fact that the bogus article is sold invariably by the retailer for the the genuine article. If it were sold as a food product at its true value, and not as an article of imitation butter, the wrong would not be as flagrant as it now is, for of this mass of 250,000,000 pounds, twenty-five per cent. is actually butter, but is thus sold under another guise, offering no excuse to condone the crime of counterfeiting dairy products.

This whole matter then comes up for consideration as a matter of commercial regulation, and our great association to producer and consumer, alike should speak out with no uncertain sound, and like intelligent dairymen give expression upon this question of fraudulently sold butterine, that this imitation of butter may be relegated to its proper place in the market. Stripped of all prejudice, and considered as a matter of supply and demand, bogus butter becomes an article of cheapened food, and when regulated, as it must be, and sold for what it is in reality, and at its commercial value, it is not then a rival of fine-made butter, and only can be when sold as a counterfeit; and I express the opinion that the first great work of the dairymen should be to get law, and the moral support of public opinion, to the end that a wide distinction must be made between the dairy and the butter substitute.

One of the better ways in this matter of protection is for the dairyman to first improve his practices and furnish the market with his best product, and then ask for a protection only that punishes with a swift hand any who would tread upon his domain. No law can protect poor butter. No

law can compel a consumer to eat it; but, on the contrary, it is a matter that the dairyman has in his power to manage for himself. It is he who can coax the consumer to feast upon a fine article of fresh-made butter, and eat it because it is so choice that none can resist its luxury. Poor butter has no real friends; no enactment of the legislature can give it friends, and the wonder is why makers will continue to devote an inch of cream to making a pound of very poor butter, and then invoke the law to protect them.

Feeling my responsibillity, and yet assuming no more than my factorship with my colleagues in this convention, I simply raise the question, "How shall the law regulate this matter?" First, the question is, has bogus butter come to stay? The impression seems to be gaining ground that it has, but in the form of a food-product. If it has not will some person point out a feasible line of prohibition? If they can not, which seems probable, then it resolves itself into a matter of taxation. For fear that a wrong impression may creep in here, I wish to emphasize the fact that our final relief must come from congress, and I hope this convention will select a committee who will draft a series of resolutions that will be widely circulated throughout the state for endorsement, to be sent to our members of congress, and impress them with the earnestness with which the dairymen are looking to that body for speedy relief or regulation. Taxation can only come from the general government, but, as this is not likely to be immediate, regulation by state law is the dairyman's first hope.

No one doubts the authority of a state to regulate the sale of any manufactured commodity, and to require an analysis of its composition, and to compel its being sold for what it actually is. Now, if the law compelled the retailer to sell this imitation butter upon its merits, then its commercial value becomes conspicuous, and the great margin of profit vanishes. Will he then continue his deceit, or will he supply the article the consumer seeks — the one customer demanding the finest butter, the other deciding between a cheap grease product and a butter which in quality offers no doubt. This matter of regulation then becomes our first

subject of consideration. The day of puny appeals for prohibition has passed. The dairyman is no child, and can fight an equal battle. If he can have the market sale of bogus butter regulated, the matter of supply and demand must, I think, govern the rest. The day of hard words and extreme criminal charges will not longer protect us as dairymen. The butterine men are entrenched. Not for a moment would I counsel any submission, but, on the contrary, I would demand every right that law and justice could vouchsafe. Our enemies have a manufacturer's right, but if they are making a cheap food product, it must be healthful and sold on the merits of its own creation, and the dairyman has the same rights and no more, save that he may raise the product to the dignity of an unapproachable table luxury. His first law in self-protection should be to make only the best and bury forever out of sight the charge that 60 per cent. of his product is inferior to the product of the grease tanks of Chicago.

If this convention can point out a better way than I have indicated, they will be negligent of their duty if they do not put themselves upon record with a feasable plan that offers relief from this gigantic counterfeit that threatens disaster to our great industry. If we can dispose of the vexed question just discussed, our next attention will be directed towards the future possibilities of dairying, and that the practical subjects named in the programme will be met and ably discussed by the talented gentlemen present from home and abroad, I have no doubt whatever. Rarely has such a combination of dairy talent been assembled anywhere in America as is gathered here to-day. Arnold, ripe in the greatest discoveries of dairy science; Harris, rich in the experience of two continents; Alvord, skilled in that wonderful experience of Houghton farm; Col. Curtis, of whose ability we of Wisconsin have ample evidence, and Gould, of Ohio, whose recent work at the farmers' institute has won him commendation from all quarters. Nor would I forget our own array of talent. Hiram Smith, that grand old patriarch, heads the list, and J. A. treads close upon his heels. Hoard, able in fact and fiction, slaughters without

remorse the "general-purpose cow." Beach, with eloquent words, pleads for the dairymen's progress; and, near the head of the column, Faville waves the red plume of clover, and charges over barren pastures and meadows. Nor would I forget Chester Hazen, whose ability and services we all recognize. We must not forget the stripling who Fish (ed) for first prizes and has caught only a New Orleans sucker. If we have omitted any in this distribution of honorable mention, if they will report to Dave Curtis, he is instructed to gather them in his rectangular churn and present them to this convention as an example of close association.

Ladies and Gentlemen — It gives me great pleasure this afternoon to extend to you a cordial, hearty and earnest welcome to this, the fourteenth anniversary of the Wisconsin Dairymen's Association. It also gives me much gratification, in looking over this audience, to see so many members of this organization, that for many years have worked side by side in developing the dairy industry of this state.

The Chairman — Is there any lady or gentleman in the audience that has his gun loaded and wants to fire into Mr. Morrison's address? If so, we will give a few minutes to that. If not, I would like to say that Mr. John Gould, of Ohio, is loaded upon all points with reference to butter and cheese making, and he will talk to you upon any subject you desire.

Mr. Hiram Smith — I would like to hear Mr. Gould on butter-making; good butter-making.

Mr. John Gould — There is no other butter that is worth making than good butter, and there is more damage to the market in making poor butter than the butterine makers of Chicago, New York and Philadelphia all put together. There is more damage done to the market by trying to skim the cream out of cheese before trying to pass it on the market as good cheese, than all the bogus cheese makers of Chicago have done together.

I want to say here, butter is exactly half made when the pail of milk is brought into the house. The public court

that charges upon the good woman of the house all the faults of butter making, has entirely misjudged the case. The man at the stable spoils more butter than the woman at the house. The man that does not stable his cows, feed them good wholesome food, take proper care of them, perform the necessary sanitary conditions and care for the cows in every way, so that they shall produce good wholesome milk, out of which good butter can be made, has lost the point that makes butter making successful, and no art or skill of his wife in the house can remedy the defects of the stable.

Just what your stable should be I don't know, but I don't see any difficulty in this country in building bank barns; it is not four stakes set in the ground, and some poles over them, and when you thresh throw the straw over it; that isn't a bank barn. It is not a barn built on a side hill with a stable floor built five or six feet above and no battens and a place where the cow comes nearer freezing than she would out doors. When the wind blows against a bank barn, you never hear the wind whistle, that is the sign of a poor bank barn. A bank barn is one in which the temperature can be controlled by good stone or double built walls, so that it never falls below thirty or forty degrees, never below forty if possible. All the cold that is introduced into your stables has to be met with an increase of feed, and they both together mean a decrease of produce. A cow won't give very much butter, if she is compelled to live out of the straw stack, or if see is compelled to fight the cold all the time.

Then to have good butter you must have good milk. It should be brought into the house as soon as possible, to secure the rising of the cream by the falling temperature of the milk.

Touching the setting of milk to secure the rising of cream, as different from the open can system, it simply introduces the element of cold to the milk quicker, so it makes a more pronounced difference between the gravities, and you get your separation soonest that way. The cream is a few pounds lighter than the cheesy matter, and as the milk cools, the gravity attaches more to the casein than it does to the fats, and one tends to go to the bottom and the other to the

top — that is all there is about it. It is simply from the force of gravity.

Where shall we set our milk? Somewhere where we can get a uniform temperature. If you use the open pan system set it as near 65 or 60 degrees as possible, for with open settings, the moment the milk goes down to a certain temperature it is too cold, the further rising of the cream stops, and you have to warm it up to get the gravity to work again, but with the cold setting, you cool the milk so soon it is all thrown to the surface in a few hours. If you have no room in the house especially adapted to the setting of milk, then get you a a cabinet creamery, and save in the economy of labor, and get uniform results. In almost every house there is a room somewhere where the cream and milk should be set. If you haven't got such a room, set it in the woodshed or on the barn floor, or set it in the parlor. It won't be used by the family only one day out of the 365, and it is just the place to set milk.

When shall we skim our Cream? Skim it before acidity sets in. The moment that it sets in there can be no further rising of the cream. You don't want sour milk in your cream. Every particle of sour milk that gets into your cream or that you allow to form in it after skimming, you have got to devote extra work to getting that out, or the penalty is strong butter, or butter of poor keeping qualities.

Ween shall we churn this cream? Churn it before acidity is pronounced. Never entertain a moment the idea that age in days gives better qualities to the cream. You must control the conditions of the cream rather than have the conditions of the cream control you.

At what temperature shall we churn? In summer, ripened cream can be churned at 58 perhaps with better results than by churning at 62 or 64, because we get a better separation a few degrees lower. With sour cream, we have to employ the agency of heat to make the separation more complete, so that in summer you can churn at 58 and 56, and I have known it to be done at 52, week after week. But in winter, you necessarily have to churn at a few degrees warmer,

simply because in winter the cream is slightly more tenacious than it is in summer.

When shall we stop churning? At the point when the buttermilk begins to show, and the globules begin to show in the granular state. Why? Because if we carry it into the lump stage, we will fill our butter pellets with buttermilk, and we can only get it out by more working. We use the revolving churn, which I know is the best churn that can be used. I ain't going to say Dave Curtis' particular churn, but some churn that goes end over end. When this butter is in a granular stage, and before it begins to collect any lumps, introduce a couple of gallons of very weak brine into the churn, and slowly agitate. I like the weak brine process of washing butter better than pure water. If you agitate it with the weak brine, the butter milk will drip out of the butter without great trouble, or without danger of the fine butter following it out of the churn. You want to use good salt, I use the same for the brine, as for salting the butter; never have but one kind in the house. Cheap salt is the dearest kind.

I wash this butter with weak brine until it shows no traces of buttermilk. Then one process of salting, is to salt the butter in the churn in that weak state. One is to wash it with brine, with all the salt that will dissolve in it. If you do it in this way, the salt immediately dissolves and coats each globule of butter with a little film of brine, and that is all that can be done with the butter to give it keeping qualities, to surround each globule with this little film of brine and fill all these little interstices with the brine. Never use dry salt in salting butter, unless the butter is in a very wet state. Never work over butter until it is nearly dry enough to pack, and then salt it. Every little crystal of the salt cuts through a little butter globule, and you cut the grain out of your butter.

Mr. Adams — After you give your butter this washing with weak brine, how long do you allow it to drain?

Answer — A very few moments.

Why do we salt butter? There is a general impression that we salt butter to keep it, and perhaps in certain ways it

might be true, but the fact is, salt has no keeping qualities in pure butter. If salt kept butter then you would find some well kept butter in the market, but the fact is, the very poorest butter has about two ounces to the ounce of salt, which salt is put in to cover up the poor flavor. It is given a salt taste, which detracts from the flavor of the butter. All you can do for keeping butter is to cover each little globule with a film of salt. For my part, I like butter fresh out of the churn, with just what salt comes from the washing with the weak brine, but it wouldn't sell in the market.

Why does not some butter come? Well, I don't know. It has bothered me exceedingly at times. I was brought up by good, pious parents, been to Sunday school, and finally have arrived at the honor of traveling in Morrison's menagerie, but I cannot get over the idea that there are sometimes witches in the cream, but the witches generally come from allowing it to stand until it is cool, or some element in the feed which has a dissipating instead of a collecting influence on the butter globules, and you will always find that after you have churned about so long, that it is not very much use to extend that churning period if you have an idea of making very good butter of it. You had better, instead of putting that butter on the market, color it up nice and take it to the next donation party. After you have churned an hour on any cream, you will find, unless you employ some extra heat, you will grind out, wear out the butter globules, and it becomes impossible to churn unless you resort to extreme heat, when it will become oily butter.

How shall we pack our butter? You must pack it as the customer wants it, and send it to market as soon as you can get it there. Don't keep it until its rosy flavor is gone and you will have to take a lower price.

Mr. Hiram Smith — Is it difficult to learn how to make good butter?

Answer — The best butter in the market is the butter that has had the least done for it, and more butter is spoiled by *over working* than under working.

Question — Which is the best cabinet creamery?

Answer — They are all on the same principle. Simply for

the purpose of cooling the milk to get a perfect separation of the cream, one is just as good as another in a general way.

The President — Please describe the process of raking salt in.

Answer — At my creamery we simply take a large box about eight feet long, with sides about four inches high, and after the first buttermilk is drawn out of the churn, the butter is thrown into this box and we work it over with a common hand rake lightly, and we get a perfect washing of the butter. Towards the last we simply push the butter towards one end of the box after salting, and it is allowed to remain in that worker until the salt is perfectly dissolved. It is kept in the same room where the temperature does not go down, and then with a flat lever it is simply carried down, not cut down through. From that box it is packed directly into packages for the market.

Question — What is a cabinet creamery?

Answer — It is simply a cabinet four feet square with deep cans, into which you put the milk and cool it down, with well water or ice water, and get a perfect separation of the cream in a few hours. Then you always get a uniform product. Cream rising in a temperature of forty-five degrees in June is exactly like the cream raised in forty-four degrees in the winter. With a revolving churn, I have for a long time abandoned the butter worker entirely, and salt in the churn, simply towards the last. When the butter is in a wet state, reach down my little paddle, spread the butter apart, and salt evenly over it, and then churn that salt in with the churn, then the working over is really packing it into packages afterwards. If there is any surplus moisture it is simply absorbed with a brine-dampened cloth.

Question — You speak about warm stables. What do you mean?

Answer — Well, I have got a stable which I don't think has frozen in five years.

Question — I didn't know but you wanted to put a coal stove in.

Answer — I think it would pay any man to put a coal

stove in his stable, and warm all the water his cows drink, and keep them warm.

Question — What is the best thing to keep cream in after it is skimmed.

Answer — I want to keep my cream at about sixty or sixty-five degrees until it is ready to churn. I don't think there is anything better than a good crock in which to keep cream, if you keep a small dairy.

DAIRY COWS AND THEIR MANAGEMENT.

By FRED. E. CARSWELL, Bear Valley.

The subject of dairy cows embraces a large field for thought, and has been so often and ably discussed at our conventions and through the columns of the dairy journals, it is difficult to present any new ideas to an assemblage like this. The topics I shall speak of will be "Selection and Management." I consider these to be the two most important problems that present themselves to the practical dairyman. It is of the former that I shall speak principally, for of the two I consider selection far the most difficult. While management may be acquired in a short time, careful selection will require several years of the closest observation. Do not think any one can point out any separate breed which will prove the best for all farmers.

We are a people of various notions and peculiar fancies, and a breed that will be well adapted to one farmer's management may not prove a success with his neighbor, and *vice versa*, yet there are some distinct markings that will aid any farmer in selecting his herd for dairy purposes, whether he be a fancier of Alderneys, Devons, Holsteins, Jerseys, or Durhams. The breeder of fine horses will show and tell why this or that horse excels for draft or trotting purposes; so the dairyman should be able to tell why a particular cow excels as a milk-giver. It is but one-half to know a fact, the other half to tell why you know it.

The first and most essential point in selecting your herd is to get good constitution, especially in this northern climate where our winters are cold and severe. If you fail in this much of your care, observation and management will be wasted, your herd will degenerate instead of improving, and your only remedy will be to begin anew. Select your calves from families such as you know will breed good milkers. Many a good cow never raised a calf that was worth keeping, while other cows invariably breed the best of milkers. A fully developed and well-marked sire and dam seldom fail to breed an excellent line of milk stock, but when only partially marked and not fully developed, generally, with some exceptions, breed medium stock, and oftentimes an inferior grade. This alone accounts for the fact that many good cows never raise good calves. If closely observed they will be found without some of the essential points required for prime stock — as for an illustration, lack of digestive functions, want of constitution, or limited lung capacity. This latter fact, bear in mind, is very necessary, for the lungs are the engine and motive power whereby nature performs her work, oxygen is absorbed, the food cooked and utilized by the system.

I will state briefly what I consider the most important points of a finely-marked, number one dairy cow. Bright eyes, thin nose, broad muzzle, with large, thin, dilating nostrils, showing her to be a good feeder and large consumer of oxygen; deep and broad through the body behind the shoulder, broad, thin shoulder, and round, broad, and full brisket, showing large size of lungs and comfort while lying down; broad hips and straight back, giving a characteristic wedge-shape to the body, and showing large digestive qualities; flat hind leg, low, thin flank, large milk mirror, with large milk veins and broad udder, carried well forward, giving plenty of storage room; a thin, elastic skin, a mild temperament, and nervous activity, and you have combined the general characteristics that are essential to a choice dairy cow.

Hoping to hear the opinion of others in regard to selection, I will close my remarks with a few words about management. Raise your own stock, and remember that it costs

no more to raise a good calf than a poor one, and any that are worth keeping at all are worth keeping well. Keep your cows protected from cold and storms in winter, give them warm stables, with good ventilation, and furnish them with plenty of water at all times where they can reach it without much travel. Feed regularly, and vary feed according to the season. Light, nitrogenous food, as bran in summer, while the cow is feeding on grass, and more heavy carbonaceous food, as shorts and corn, mixed, in fall and winter. Bran and oats mixed for spring feed, to thin the blood and avoid fever, and vary at all times to suit the nature and condition of the stock you are raising. Milk regularly, carefully and thoroughly, and you will find that good dairy cows, well selected, well fed, and well cared for, will pay a ten per cent. profit, even in hard times.

DISCUSSION.

Question — You speak of the mirror that a good dairy cow should have, a broad milk mirror?

Answer — Yes, it is generally considered to be one of the marks of a good cow.

Question — How many of these marks are there? It is the important question in the selection of a dairy cow. How many mirrors are there on a milch cow?

Answer — I am not prepared to answer that.

Question — There are sixty-four. There are eight classes, and eight in a class. It is the average rule that the cow with the broad mirror gives the greatest quantity of milk. This Flander cow that he speaks of, was driven to pasture by a poor boy, and one day, he noticed the dandruff on the mirror, and he began to scrape it off. He knew the cow was good for butter, and he commenced studying up that question. He saw the other boys' cows were different, and from that point he found out how much a cow would give, from her mirror. And the French experimental farm tested him, until he made it so perfect, that they gave him a premium, and gave his theory and experiments to the world. This was over forty years ago, and it was published and

sent to the United States government by our minister at that time, and several New York agricultural papers had it published. Forty years ago I studied it, and now I can say to you the larger that a milk mirror is, and the richer the dandruff is, the richer the cream.

Mr. Hiram Smith — My impression is that there have been grave doubts about this matter of the milk mirror. I should like Prof. Arnold's views in regard to the dairy form of the cow, and in regard particularly to this milk mirror, that is relied on by so many.

Prof. Arnold — Well, I have no objections to giving my views of the general form of the dairy cow. I never believed in signs even when I was a boy, that had no connection with significance. I never planted potatoes in the full moon, nor weaned my children because the signs were present. Signs to be of any importance must have some connection with the things signified.

Now the form of a cow has some reference in her milk-giving qualities as it has to her powers of duration or her general constitution. When I look at a milch cow, the first thing I take into consideration is, has she got a good big stomach. She has got to make her milk, the butter and the cheese out of the food she can eat and digest, and she must eat and digest more than enough to support her body or she will not be able to give much to me. For that reason I look at her digestive capacity as the first essential. I see that she has a large stomach, she can take in a good lot of feed and digest it. Her ability to digest I judge from the general appearance of her coat and her eye and the size of her chest. If the animal has a dull expression to her eye and her coat, you may know she is not a very full feeder, because if she is, the pupils will distend the surface and she will be active and bright. I am pretty sure to go behind her and look at her mirror, but still I have never been able to trace any connection between that mirror and the milk-giving power. I don't know but it is all fancy, but I do notice that the largest milkers are sure to have a large mirror. But, on the contrary, I find cows frequently that give large messes of milk and rich milk that have a small mirror. It has

been stated that this milk is the result of the arteries which supply that portion of the body with blood, and that is true generally with the animal economy; it shows that a large amount of milk flows to the udder and these arteries flow towards the udder from the back side. But suppose that it does indicate the amount of blood that flows into the udder, it can not of itself be a safe guide to determine the qualities of the cow, because there are so many other modifying circumstances that come in. The mirror is not going to save her if she has not the other qualities.

I also look at a cow's mouth. When we have a cavity to be filled, the apperture to the cavity is an indication of the space we have got to fill. When you see a cow with a good broad mouth and thick lips it is an indication that she uses them a good deal. It is just so with the wide, open nostrils, she takes in a great deal of air. A person with a large mouth generally has a large stomach. The other forms, the broad hips giving capacity for the udder, and various other indications having the feminine look, the feminine form, are valuable indications. So the wedge-shape has an important bearing because the cow will not use up so much of the force of her feed in exercising if she has comparatively smaller heart and lungs than she has stomach. A cow that has a large heart and lungs will be active, stir around a great deal and use up the force of her feed in that way instead of converting it into milk. A cow that is a little sluggish gives the most milk for that reason. I cannot see any connection between the slim horn and the flat leg, yet most everybody wants them.

Question — Don't they show good breeding?

Answer — It shows flat-legged breeding. I cannot see any connection in the form of the bone with the milk.

Question — Isn't it true that no food can be digested until it is warmed up to a certain extent? Now, where do you get the heat, only from the lungs, together with the carbon? What is the big stomach to do with the food it takes in unless you have big lungs to take in oxygen to produce heat to cook it; isn't that a true theory?

Answer — No, not exactly. You are asking a little too much of a good thing. You want heat enough to warm the feed and keep the cow warm, sustain her temperature, but you do not want an excess, to keep her making more heat than she has occasion to use, and develop force so she has got to stir around some way to drive it off, get rid of it.

Question. I ask if the lungs and stomach should not be in proportion?

Answer — They should be in proportion, but I would have the stomach rather the larger of the two.

Mr. Adams — This whole talk has been made upon the supposition that the lung power depends upon the size of the lungs. Is that a correct supposition?

Answer — Not any more than the size of a stick of timber is indicative of its strength.

Question — Is not the arterial circulation of as great importance as the lungs in the distribution of the oxygen?

Answer — Certainly. You want enough to give a good figure and growth, but no extreme development.

Mr. Faville — About this milk mirror, I want to say, the best milk mirror I have ever seen is a fine show in the pail. I never have seen a man but could tell a fine cow better after he had milked her a year, than he could by looking at all the mirrors she had got.

THE FEED AND THE COW.

By HON. H. C. ADAMS, Madison.

I shall speak of the butter cow only. If I use positive, dogmatic terms, it is because they are concise. The butter cow has a feminine head. The bull head has no proper place anywhere in cow economy, on either male or female. The next point in importance is the udder. It should, not must, be stretched well over the lower line of the body; it should be broad at the base, between the flanks, and when empty should look as small as the pocket-book of the innocent who is ransacking creation for the general purpose cow. Large milk veins indicate a large milk yield. A soft, yellow.

easily-handled skin indicates less surely a good butter cow. The cow is an engine to produce both motion and milk. Her digestive organs constitute the boiler; they must be large, well distended, covered well back with great curved ribs. Beware of the cow with a stomach like a greyhound. Sell her to the general-purpose man for a trotter. Do not be afraid of the pot-bellied calf. It makes the broad, deep-bodied cow. Very small cows are often great butter factories; but they always have digestive organs large, and out of all proportion to their size. The cow which can reach the maximum of butter production and the minimum of size, is the animal we want. Why should a dairyman care for a big cow unless he wishes to sell out to an oleomargarine factory. It takes more heat to keep warm 1,400 pounds of meat than 900 pounds. It takes feed to make heat, and feed to make milk. A diminished heat necessity makes a diminished feed necessity, or an increased milk production. Flat horns and slim tails are not essential to the good cow; neither is an escutcheon. This last may be rank heresy. I have fallen from grace as far as the escutcheon theory is concerned, and may have gone to the other end of the rope, but I do not believe the Creator intended the cow for an object lesson in applied geometry. Some of the best cows I have seen were as destitute of escutcheon as a lot of burr oak trees. What kind of a proposition is it to lay down that a cow's hair should run down on one side of her and up on the other, in order to make her a butter aristocrat? The long legged cow is an abomination. She is always a disappointment. She will not even kick when you expect her to. The blackest sheep of the cow kind, however, is the cow whose face is convex. Do not take her as a gift. She will kick the hardest, have the most frightful looking calves, eat the most, put the most water and least butter in her milk, of any individual of the bovine kind known to men. The thoroughbred cow is queen. The native is a mongrel — occasionally good, generally bad. The calf of the good native cow is the most uncertain kind of a lottery ticket. You can estimate its value about as closely as you can the verdict of a petit jury in Wyoming Territory. The grade cow is a com-

promise, and a very good one. She is not better than the thoroughbred for milk or butter. The law of heredity and care in breeding have made the thoroughbred cow the solid corner stone of the dairy interest. She can reproduce something more than bones and blood; she can send her milk and butter tendencies straight down through generations.

The point for each owner of a cow to work for is a standard of not less than 300 pounds per year. Many cows can not reach that point under any management. They should be gradually worked out of the herd. With butter at 20 cents, skim-milk at 25 cents per 100 pounds, and the calf at $7.50, the 300 pound cow brings a net revenue of $42.05, the 200 pound cow brings a net profit one-half as large on the same feed. One good cow, then, would have a selling value more than twice as great as an ordinary cow. All the other factors in the butter problem may be right, but if the cow is wrong it can not be satisfactorily solved.

Following the cow stands the feed question. The cheapest summer feed is grass. It is a perfect food. It requires no grain ration. Pasturage in Wisconsin averages, when bought, $10 or less each cow through the grazing months—a cost of 5½ cents for each day's feed per cow. If a cow eats grain she will consume less grass without a marked increase in her product. This assures an ample supply of green feed in the pasture. Late in the summer pasture becomes short. Oil and corn meal at this time are cheap at $4.25 per 100 pounds. The cow must be prevented from lowering her yield at all hazards. Green corn stalks are better and cheaper than grain. Make the ground for fodder corn rich. I have used southern corn in drills two feet apart, kernels three inches in the row. The best dairymen to-day are putting in sweet corn in rows three and a half feet apart. Raise pumpkins by themselves. Plant in hills eight feet each way, with a shovelfull of rotted manure in each hill. The bugs will never keep up with the procession. Take all seeds from pumpkins before feeding, or else you will need Warner's Safe Cure in car-load lots. Pumpkins make the best milk of any known feed. In winter save feed by keeping the cows warm. Do not worry about the ques-

tion of exercise. It is largely a humbug. Keep the cow in the stanchions two weeks rather than have her chilled by a Wisconsin blast once. The best kept cows in the world are in the basement of London, months at a time. The cow is a creature of habit. The stanchion habit once fixed becomes easy. Lumber and fuel are cheaper than feed. John Boyd says that one cord of wood equals one hundred bushels of corn in sustaining the life and flesh of the cow. The question of ventilation is not a burning one here in Wisconsin. Still, men open their barn doors to give their cows an appetite, and let in a lot of cold that it takes feed at eighty cents a hundred to drive out. Ninety-nine out of one hundred barns in this state now are full of ventilators that must be battened with corn meal or middlings. Cows should be given warm water in the barn to save feed. I have followed that practice for six years. Warm the water to any point between 80 and 100 degrees. Give it to the cows at ten o'clock with two quarts of middlings to each cow stirred in. They will drink from seven and a half to fifteen gallons. Water but once each day. The cows will not drink the second time unless the water is cold. It takes feed to make vitality and heat. It takes vitality and heat to warm up a lot of cold water in a cow's stomach. Warm the water with a stove or engine, and the cow is left a surplus vitality for the production of milk and a surplus of feed for the same purpose. In my own experience I have found that cows given warm water increased their production of milk from 20 to 30 per cent., with no perceptible difference in the ratio of cream to the amount of milk. Cows should be fed grain according to their idividual capacity. They should be fed up to the line where milk production stops and flesh production begins. A uniform ration in quantity for a herd of cows is an absurdity. How would it work to put every person in this convention upon an average amount of food for the next one hundred days. Brother Hoard would starve to death. Fifteen pounds of ground feed may not be enough for one animal, while ten pounds may be too much for another. My cows are feed dry grain twice each day.

The first feed is given immediately after milking in the

morning, the second after miking at night. The defect in my feeding is in not feeding three parts of cut hay or stalks with each grain ration. I find Minnesota shorts the cheapest food. Corn and oats ground together produce the best colored milk. No rations of a single grain will equal ground oats. But oats cost too much if above twenty cents per bushel, except to vary the feed. A cow needs change in her grain feed. Alternate from middlings and bran to corn meal and oil meal, or oatmeal and middlings. Rye bran is good. Buckwheat bran a nuisance. Malt sprouts analyze away up with oil meal in the albuminoids. They are kiln dried and weigh less than bran. They must be soaked for three hours before feeding. They are sweet and easily digested. Clover cut in full bloom is the best hay; millett ranks next. Corn fodder and fodder corn should go through a feed cutter. I am lame but not cross-eyed on this subject in my own feeding arrangements. The indications are that the silo is being pounded into a shape that will make a half revolution in our feeding processes. We need a succulent, easily digested food for winter use. The slowly and cheaply filled modern silo with sweet ensilage full of pure water, distilled in the organism of the plant, and passing easily through the membraneous and digestive process of the animal give us a food ideal in both cheapness and excellence. I have exceeded my time and my space. Even against the competion of cholera-stricken hogs, and the hypocritical butterine humbugs of Chicago, the Wisconsin dairymen, with good cows and intelligent system of feeding, can still increase the richness of his farm and the size of his bank account.

Question — With us here it is a matter of dollars and cents, and what I want to ask you is, if from your actual experience, you can decide the difference between the net profits of summer and winter dairying in butter?

Answer — I have no exact figures at my command to show that difference, but my impression is, from my experience, that there is at least one-third difference in favor of

winter dairying. I think Mr. Hiram Smith can answer that question very much more fully than I can.

Mr. Hiram Smith — I have no hesitation in saying that there is a good deal of difference in the value of the milk. If you get from fifty cows one thousand four hundred pounds of milk in June, and it is worth at the creameries forty-four or forty-five cents a hundred pounds, as it was the present year, and you get at this season of the year four hundred pounds, which is worth one dollar and one-half a hundred pounds, it seems to be no great stretch of intelligence to see that it must pay to reverse the two. I find since I have reversed it, that the difference is sufficient to pay the wages of all the help I hire upon the farm.

Question — What is the actual difference in expense between wintering a cow in milk, and one not giving milk?

Answer — In both cases, I feed what grows on the farm.

Question — Will a cow be as likely to give as many pounds of milk coming fresh in the fall of the year, as she would coming fresh in the spring of the year? And if so, will she return more in proportion to the feed, net profit, than she will coming in the spring?

Answer — In answer to that I should say she will give more butter. A spring cow filling herself with fresh grass may give more pounds of milk, but we frequently hear it said that it takes twenty-eight and thirty pounds of milk at such times to get a pound of butter. While in the winter twenty pounds will do it. As to how much she will give in the whole year, my experience is that she will give more, coming in milk in September or October. For the reason that at the time she naturally would fail in milk, she has fresh grass that aids to keeps up the flow of milk, therefore you get more milk value from a winter cow than a summer cow.

Mr. Faville — Mr. Adams, did you ever try feeding whole corn to milch cows, not ground at all?

Answer — No, sir, except to a limited extent.

Mr. Faville — I am feeding my cows now, corn just drawn from the field, and then run it through the cutter, corn and stalk and all, and cut it up about three-quarters of an inch

long. I am feeding them with a little bran, and they are making butter splendidly. We have just doubled the amount of butter from the same number of cows, since we changed from feeding them middlings, and bran. I think our proportion of butter is larger to our proportion of milk and the butter is so fine a color that it takes very little butter color. We use the yellow dent corn.

Prof. Arnold — Do the cows grind the corn well?

Answer — Yes, they grind it fairly well, and what they don't grind they put in the very best possible condition for the hogs.

THE UNKNOWN IN DAIRYING.

BY COL. T. D. CURTISS, Syracuse, New York.

There was a time, not long since, when it was easy to choose a subject for a paper on dairying. There was then little or no dairy literature, and the whole field was open to choose from. But not so now. Every branch and phase of the subject of dairying has been presented from manifold stand-points, and about everything said on it that can be said. It has been talked upon and talked about until one who is familiar with all this talk is completely satisfied with it. He has had *quantum sufficit*. But still, like the routinism of school-teaching, the work must go on. New students are constantly presenting themselves, and there are still thousands of men engaged in dairying who have never attended a dairy convention, and many of whom do not take or read an agricultural paper. If we could only have them as auditors, it would be almost a luxury to repeat to them the commonest common-places of dairying. That it would do them good, is attested by the vast amount of inferior farm dairy goods that are thrown upon the market to compete with the enterprising and energetic manufacturers of bogus dairy products. But how are we to get them? It has been said, "If the mountain will not come to Mahomet,

Mahomet must go to the mountain." Moving about and holding conventions in different localities, as this association does, is one way of reaching them.

But the mountain of human ignorance is a very large one; the Mahomet can go to only a few spots on it. The rest remains undisturbed and uninterested. We produce a little agitation here and a little agitation there, but the great mass remains unmoved and will remain unmoved for a long time, unless we can hit upon some new expedient for reaching them, or some sort of spiritual or intellectual cyclone sweeps over the land and so frightens them that they will cry out in their despair, "What can I do to be saved?" The hard times have already driven a few forward onto the anxious seat, to be prayed for; but when I attempt to buy butter and cheese for my family, and see the dairy goods that are handled by dealers, I am filled with fear and trembling lest the great mass of old and hardened sinners among the dairymen are hopelessly lost forever. But through all branches, and all parts of branches, of dairy topics have been discussed, more or less, by the numerous dairy conventions held yearly throughout the country, and the columns of the dairy and agricultural papers; and although it is difficult to choose a subject on which one can make himself interesting, if not instructive, to a convention of veterans like this — and especially when the programme is long, full and varied, as is the case with that of this convention, and one has not the advantage of having a topic assigned to him for his exclusive use — it by no means follows that all is known that can be on the numerous topics that have from time to time engaged our attention. The unknown still vastly preponderates over the known. Those best informed the most feel their ignorance, and are least willing to dogmatize or to assume superior knowledge.

I heard Dr. Sturtevant declare before the convention of the New York State Dairymen's Association, that four years of incessant study of milk, at the state experiment station, with almost constantly contradictory results, had convinced him that he knew less about milk now than he

formerly supposed he did. Among other things, he had fed putrid food to his cows for forty days without any apparent deleterious effects on the milk! This was contrary to expectation as well as to popular belief and the generally accepted results of private experience and observation. But, on the contrary, while he was giving his cows the best of feed and the best of care, according to his judgment, the milk suddenly became bad and behaved in an astonishing manner. Close inspection detected the presence of bacteria in the milk and in the atmosphere of the stable breathed by the cows. A careful search disclosed in one corner a small amount of decaying substance, whence the bacteria presumably had come. Yet, it was so inconsequential that it had been entirely overlooked untill the mischief in the milk arising from it compelled a search for the cause. With the ordinary dairy farmer the discovery of the cause would never have been found, the trouble would have continued, and the dairyman, if an employe, who had the misfortune to make butter or cheese from the milk would in all probability have received the blame. The moral of this is, that all dairymen should be very careful about the surroundings as well as with the management of the dairy.

In a similar strain to that of Dr. Sturtevant, was the private conversation with me of Dr. Martin, of New York, who is the chemist employed by one of our state dairy commissioners, Hon. J. K. Brown. Dr. Martin who has analyzed and manipulated, in one way and another, tens of thousands of samples of milk, was very cautious and very modest about making any positive assertions. Long and perplexing experience has taught him that "trifles light as air" may come in to change the result of his experiment and upset all his previous calculations. Yet, I almost daily meet dairymen who not only know much more than I do, but could instruct Dr. Sturtevant and Dr. Martin in what they thought they knew years ago! Not long since I saw a writer, John Gould, of Ohio, I think it was, credited with saying that one hindrance to progress in cheese-making, was the fact that cheese-makers of one year's experience knew more about the business than men like Prof. Arnold,

who have devoted a life-time to its study. The assertion is a verification of my own observations in this direction. Some day somebody will have occasion to exclaim, with the rhymster:

"I thought I knew I knew it all;
But now I must confess
The more I know I know, I feel
I know I know the less!"

There is too much superficial knowledge in this world which passes current as sound, and dairying, like other branches of human activity, is not without its charlatans — and very good people, and honest they may be, too, but terribly mistaken. This, however, does not prevent hasty judgments and positive conclusions, founded on erroneous or partial evidence. Whoever teaches within the bounds of reason cannot escape their criticism. Their admiration is for the man of bold assumption, miraculous achievements and undaunted cheek, who has no trouble in riding them down rough-shod. They lack the knowledge and discrimination to determine the false from the true, and prefer the dicta of the charlatan to the modest confessions of the man of science.

If one only knew all about the science of dairying — or rather the art of dairying, for art is the practical application of science — how easy it would be to tell the dairymen all about it and save all further trouble! We could dispense with dairymen's conventions in a very short time—as soon as as everybody had attended and heard, as of course everybody would do; and we could dispense with experiment stations and save a vast amount of useless expense. If I knew it all, I would not only tell you, but I would put it in a book—price, 50 cents — and I should be overwhelmed with the piles of silver that would leave the government vaults at Washington to pay for that book! Everybody would buy it, and they would not only read it, but sleep with it and commit it to memory. It would be in their thoughts by day and their dreams by night, so great is human thirst for accurate knowledge! You all know how it is. You know how hard it is to

keep people away from such conventions as this, and to prevent their reading dairy and agricultural papers generally! You know how many millions of your secretary's reports are annually called for! The state press is scarcely able to furnish the necessary supply! The people must and will have light, and they cry for it as the pet of the house cries for the lighted candle at midnight when everybody wants to sleep.

But woe unto the man who should ever possess such knowledge and give it to the world! It would be a fearful gift for him. Everybody would receive the instruction according to his own understanding, and the sum of mistakes and failures would be enormous, and they would all be laid at the door of the unhappy teacher. Hog cholera and abortion in the dairy herd would be charged to his account. Whatever of the evils resulting from human ignorance should thereafter transpire would rest upon his shoulders. No, I do not think I would like to be the victim of such glad tidings to a too highly appreciative world! I had rather the silver, useless as it is, should remain in the vaults at Washington.

Many people suppose they understand the composition of milk. I knew of a teacher in one of the high schools of my state who told the scholars that milk is a very simple compound of water, cheese, butter and sugar. She was afterwards shown Dr. Sturtevant's table of the composition of milk, giving over twenty different constituents, and, in the language of the boys, "it broke her all up!" The fact is, if we know anything about it, that milk is a very complex compound of compounds — of materials mixed both mechanically and chemically; and notwithstanding everybody is so familiar with it, and it behaves quite orderly under ordinary and favorable conditions, there is no knowing when the witches may get into the churn or cheese vat, and defy all our arts at exorcism. Two years ago, at the Iowa State Dairymen's convention, at Strawberry Point, two cases were reported of the cream of a herd that had behaved all right, which suddenly refused to yield up its butter, and no amount of churning would avail. No cause could be assigned for

the unfavorable change, yet unquestionably there was a cause.

Recently I received a letter from a dairyman in Michigan who had a similar sudden change in the behavior of the cream of his herd, which happened in November last. He had been completing his churning in from twenty to forty minutes. Then came the change, and it required thereafter, up to the time that he wrote me, from two to six hours to churn. He churned at sixty to sixty-four degrees. The puzzle to me is, why the butter should separate at all. after that length of time. There must have been some change in condition. We might attribute it to change of temperature, but he gives the range of temperature. What was there about this cream that made it require six hours of churning and then yield up the butter? Some say it took that time to break the caseous covers on the butter globules and free the butter so the particles could unite and cohere. But suppose there is no caseous covering. I understand that recent experiments made at the New York experiment station during the past year, by Prof. Babcock have pretty conclusively demonstrated that the butter globule is only a small drop of fat swimming in the serum of the milk and having no covering whatever. In proof of this he was able to break up these globules into finer ones by agitating the milk at a given temperature; yet, still they had the same natural appearance of butter globules, only finer. At another temperature, by agitation, he could unite these globules, doubling and trebling their size. In this way he could make Holstein-Friesian butter globules in Jersey milk, and Jersey butter globules in Holstein-Friesian milk. It all depended on the temperature at the time of agitation. What these temperatures are has not yet been made public, so far as I know.

By this light we could explain why cream refused to churn. It might have been at such a temperature that the fat globules were constantly divided instead of united. They were beaten into atoms instead of butter. But unless there was a change of temperature why did the fat globules in the Michigan dairyman's cream finally cohere? Was he

churning at just that temperature that favored neither union nor division, but rather inclined to union, which finally gained the preponderance? It is possible. A little higher or a little lower temperature and it might not have churned at all, or churned easily. We may learn more about this in the future.

Further about Prof. Babcock's experiments, I understand that he was able to make emulsions of various fats and oils, the globules of which were like those of milk in appearance, and furthermore, that he was able to churn them into solid consistence, like butter, or to divide them into smaller globules, as was the case with the fat globules of the milk. But in all cases he had to have special regard to temperature, each emulsion demanding a temperature of its own. Have we not here not only the secret of the relations of fat in milk, but of the philosophy of churning? The fat of milk is held mechanically in minute microscopic drops, and floats freely. Churning demands agitation at given temperatures, which, I suspect, must be a certain number of degrees below the melting point. This, of course, is not knowledge, but speculation.

Most dairymen — some of them good people and good butter-makers — suppose that salt must be worked into butter, and they want a salt that will not desolve until it is worked in. This is a venerable idea, as bald-headed as "Artemus Ward's" butter. But the signs are that it is destined to "step down and out." The fact is, that butter never ought to be worked so long as there are undissolved grains of salt in it to cut and scour it, making it greasy and oily. The butter should be washed while yet in the granular form, as most dairymen now do it, then be permitted to drain. When well drained, the salt should be sprinkled over the granular mass, which should be at a temperature of 55 to 50 degrees, and then carefully stirred in. It may be done in the churn, or on the butter table, and a common hay rake is a good tool for stirring a large mass on a table. If the salt is pure, of even grain, and fine, it will speedily melt, and the brine will be evenly distributed all through the mass, covering every granule. No working of the butter is re-

quired. It only needs to be pressed together, and this may be done in the packing. Some think it better to first press it into a solid mass, but this is not essential. This method of salting butter and preserving the "grain" has long remained among the unknown things of the dairy. But, in the new dawn, it is heaving into sight as one of the facts of the future.

One of the facts of the present is bogus butter, which is about as uncertain a character as Hoard's general-purpose cow, that he persists in treating as a no-purpose cow. There is a very general purpose in bogus butter — defrauding the consumer and robbing the dairyman of his patronage. So far as bogus butter is an imitation and counterfeit, it should be suppressed, the same as counterfeit money. All counterfeits should be suppressed in the same way. As an honest substitute for butter, the bogus article, if not shown to be unwholesome, must have a fair show. But it must not be permitted to sail under false colors, nor to wear a deceptive garb. This is what the dairymen have to look to. They must have laws compelling the retail of all substitutes under their own names and own garbs. Then they must see that the laws are enforced. They must not expect others to secure this legislation for them, nor to see that it is made effective. "God helps those who help themselves," is a trite adage. The old negro had the correct idea when he explained how he got answers to his prayers. Said he: "When I pray de Lord to send me a turkey, I doan get 'im; but when I pray de Lord to send dis nigger arter the turkey, I allus get 'im afore daylight."

APPOINTMENT OF COMMITTEES.

President Morrison — I will now appoint the following committees:

On Resolutions —

W. D. Howard, Fort Atkinson.
John Gould, Aurora, Ohio.
H. C. Adams, Madison.

On Dairy Utensils—
Stephen Favill, Delevan.
H. Z. Fish, Richland Center.
Chester Hazen, Brandon.

On Dairy Exhibits—
C. F. Dexter, Chicago, Illinois.
W. H. Hintz, Elgin, Illinois.
W. F. Davis, Sheboygan.

On Nominations—
Hiram Smith, Sheboygan Falls.
L. N. James, Richland Center.
C. R. Beach, Whitewater.

On Essays—
Prof. L. B. Arnold.
Col. T. D. Curtis.
Prof. W. A. Henry.

The convention adjourned to meet at seven o'clock P. M.

EVENING SESSION.

Convention met pursuant to adjournment at 7 P. M. President Morrison in the chair.

WORK.

BY MRS. C. V. LAYTON, Lone Rock.

No where in the early history of man is the phrase "dignity of labor" employed. It is related that our earliest progenitor had labor presented to him in quite a different light, and it is no where shown that any of our remote ancestors assumed any great amount of that dignity, if they could possibly escape it. The phrase perhaps orignated with some royal exile, who losing his divine right to live off other men's work, strove to wrap around the fleshless limbs of the horrible skeleton necessity, some of the royal purple he once had worn. He would invest the idea with some of the blue distance of poetry, and by "making believe, very much" and make people think he enjoyed it. Or it may be a phrase

coined by some court flatterer of those royal mechanics who from rude chaos and disorder, framed kingdoms strong and steadfast. Peter the Great, learning ship building that Russia might have a navy, or rough old Fredrick William of Prussia, who was justice, marshal and street commissioner as well as king. Kings, were the men who idealized butchery, and dressed it in scarlet and tinsel, perhaps they also idealized drudgery; but it is more probable that it is a specimen of that style of fervid eloquence called stump oratory, and originated in an attempt to lend radiance to the obscene and dull hued horizon of some political aspirant.

Our Washington is represented in a picture intended to cultivate in the youthful mind a love of farming, as seated on horse-back watching a troop of slaves at work, and beneath are printed the words, "agriculture is the most useful the most noble, and the most elevating employment of mankind." The boy to whom the picture was given said, "if Washington had got off his horse and taken that heavy hoe from one of the negroes and tried it awhile he would have said, 'agriculture is the most useless, the most tiresome and the most degrading employment of mankind, surveying is far more interesting.'"

Martha Washington was a beautiful dignified woman in powdered hair and rich brocades, but if she did her own work and had to hurry to wash the bread-dough off her hands before she answered the door-bell, with face and hair powdered with flour, if she could be dignified and unconscious, not humble and apologetic, then was she a real Lady Washington. Where is the dignity of milking? An awkward usurpation of the natural rights of the calf.

What the dignity of mopping? It is worse than Bunyan's man with the muck-rake; one may fancy mopping as a sort of gymnastic exercise; or have left as a remnant of childhood's fancies a taste for it, such as some have for modeling in clay, or dabbling with oils and paints, but one would not pose with a mop for one's portrait.

Where is the woman who can appear dignified while madly brandishing two paper bags cut in strips, and mounted

on broom handles, in a relentless raid on the useful house-fly?

A woman putting down a carpet is a deplorable sight, and a man putting up a stove, may be eloquent, but never dignified. Our artists are obliged to go to Italy to find a people lazy enough to pose gracefully, which shows how unpicturesques are the demands of labor.

A man who has cows to feed and milk, and a corn crop to get in and out, is too busy to be handsome, and a woman hanging up clothes, with a clothes pin between her teeth, and a fear in her mind, lest the fire should be out, and dinner not ready when the men come, is apt to forget, that slow motions and a low voice are most desirable attributes of womanly beauty. Yet poets have sung of labor, and composed their odes in bed; orators have extolled the working man and made work and honesty almost synonomous terms. It used to be customary to invite some city gentleman to speak at July celebrations and agricultural fairs in the rural districts when they spoke so flatteringly of farmers and praised their honest faces, their hard hands, their honorable employment till it fairly made the farmers blush at first, but they became accustomed to it and seemed to consider it all their due. These same gentlemen used also to shower upon the ladies, delicate confections of flattery. "Thanks for the inspiration given by the presence of the ladies a galaxy of beauty with their bright eyes and rosy cheeks; thanks for their kind attention, which must have been wearisome indeed."

But all that was long ago; now, men often listen to addresses made by women and would feel insulted to be thanked for lending inspiration by the very presence of their manly forms, their utterly lovely moustaches, and have learned that women do not weary of listening to practical ideas on subjects relating to their employment and surroundings, and some men believe that by the time the world owns womanly right to a country, she will have mastered the first principles of civil government.

City and county have come nearer together and have ound that the depths of wisdom and experience are not

always sounded by the city man; that a farmer's heart may be as hard as his hand, that his mind is not always as broad as his acres, and when it is, it is not the direct result of physical labor.

It is true that to the farmers has virtually been conceded the monopoly of honesty, and so long as he keeps strictly to his calling, he is above suspicion. It is only when he enters into commercial relations that he has opportunity or temptation to dishonesty.

The Carthiginians were equally noted for their commerce and their dishonesty, and the question rises whether they would not have had better reputations if their land had been better adapted to agriculture. But this gives rise to too many questionings since if honesty is indisollubly connected with the successful cultivation of the soil, we might have a new government office, a kind of Bureau of Morality, and daily prognostications appended to the weather probabilities, all of which would be of great value to the cheesemaker if not to the average farmer. The joys of the farmer's work come from his near approach to nature, he receives his harvest direct from earth and air, sunshine and rain, but his trails come from a cloud the size of a man's hand which interposes between him and the exchange of that harvest, must he hope that a man of money will make a corner in wheat, or that two or three kings may quarrel in Europe in order that breadstuffs may rise? And if the corner is broken, and the market flooded, or the holders of Egyptian bonds having secured them have ended their holy war, and the cry goes out of "overproduction" does the honest farmer draw a sigh of relief because the poor have all been fed, and there are twelve elevators full left over? Does he stock down his farm and go to making butter and cheese for those hungry ones to eat with their bread? O golden age, when labor meets its just reward and the land flows with milk and honey.

It has been said of late that the farmer allows hard labo to absorb every energy, which has the effect of depressing the intellect, blunting the sensibilities and animalizing the man. And yet there is no avocation which allows more

time for thought than the farmer's (if he be truly a farmer, and not a mere land owner and overseer), and it is thought that makes the man, not material or mental acquirements.

The long furrows and stoneless soil of our western country ought to produce a race of thinkers among those who guide the plow, and why may not the new poetry of our new land be penned by the hands which guide the conquering march of the mowing machine over our broad meadows. E. C. Stedman has proved that a Wall street broker can be a poet and what a paradise for thought and sentiment is the farm compared with the inferno of the stock exchange. But the sweetest songs were never sung, the fairest thoughts have never blossomed into verse, and earth crowns her men of deeds whose works are symbols of their thought and rouses to lofty emulation hearts that never thrilled to the poets' strains.

Work into which one puts his heart can never brutalize and the farmer should love his calling, to be happy and to be successful, and his wife should be his business partner, or, at least one of the committee of ways and means. The isolation of farm life makes this more necessary than any others. There are few women whose ideal of earthly happiness is to be matron of an asylum for cow milkers, for the compensation of board and clothes, and the dire possibility of the use of one third of the cow pasture if left without a "natural protector." "O, says the good farmer, love is enough to make the path smooth" Is it? Then go home and deed your farm to her and try it.

Though there is no dignity in labor, yet the world must be fed and clothed and houses made which mind and soul may convert into homes, or which may stand, staring piles of brick and mortar mere shelters from the seasons. No one should be asked to take up manual labor because labor is holy, because labor is worship, because labor is beauty, for it is none of these.

In the beginning labor was a light penalty laid upon man for disobedience, he should earn his bread instead of lazily plucking it from the trees; at the present labor is a curse laid upon the weak by the strong. "Thou shalt earn thy

bread and mine," is the new command. It fares ill with the poor Adams of our later civilization, since they have lost even the ground they might till. Will the babes rest much longer to the "lulla-by baby, labor is grand?"

I know that stereotyed phrase "growth of monopolies" is very tiresome to the average capitalist. He gravely informs us that we never hear a word about monopolies from any one but poor wretches who have never succeeded in anything. Perhaps he thinks the bankers and bondholders, the Standard Oil Co., the R. R. kings, or their servants, the state and national legislatures, might speak with more authority on the subject; but he can scarcely expect to hear from those with whom silence is policy, and policy their guide.

The people must arouse to this work, or they must submit gracefully to the continuance of a peasant class in this country, and must learn for themselves and teach to their children, the humility and servility on which with unresting toil they must depend, for the rich grow richer, the poor poorer, year by year.

We have none of us so far outgrown the penalties traditionally imposed upon our first-father for his willingness to obtain knowledge, that we can hope to live without work, unless we prefer to beg or steal. I should be glad if every able bodied person was compelled to a few hours of work each day. I doubt not the work would all be done in the forenoon, and the would sit down in the afternoon with a clean apron and a clear conscience.

We should not strive to enoble physical labor alone, when we see starving souls and starving minds looking out of the windows of well fed bodies; when we see souls striving to overcome body and make a splendid animal know that he ought to be a man, and when we see souls and minds fed on spiritual and mental pap, which was prepared centuries ago and is now gently warmed, and stirred, and tasted, and fed to men and women old enough to feed themselves.

Instead of teaching children that the world owes them a living they should be taught to do their share of the world's work, but not all physical labors, though they choose to be farmers. The world does not always repay those who work

for her with grateful praise, yet every right act, well done, adds to ones mental and spiritual stature and makes the way easier for those to follow who shrink from censure and can not live without public approval. Garabaldi when exiled from Italy, might have lived off his patriotism, but he went to boiling soap on Staten Island, thus waiting for the day to come when he might lead his countrymen against the invading hosts of Austria. Killing Austrians and boiling soap are neither of them grand or noble acts, though poetry sings of the sweets of labor and the glories of the battlefield ever so grandly. But they were acts which were necessary for self-respect, and self-defense for the true. Country is but another self.

The first and noblest work for human beings is self-culture, not the surface polish of manner acquired in society, nor that gathering and storing of corn against probable famine, called education, nor that delving in dust heaps for possible treasures which a prescribed course of study must mean to any thoughtful person arrived at maturity. But the culture of the virtues, the destruction of the vices, the cultivation of the waste places in the soul. For eradicating faults severe self-consciousness is required, but the work of culture requires also a large degree of self-forgetfulness. To aid in this work the study of the social and political problems of the day is more improving than the history of Persian wars; the statistics of poverty and its attendant crime in our own country more thought inspiring than abstract mathematics. Reading from the open book of to-day, as deciples of the gospel of hunanity we turn from its pages sadder, but wiser.

Next to self culture, in order of duty, comes the training of children for lives of use and beauty. The mother's influence over the average boy does not extend far beyond the cradle, unless it is strengthened by the father's example — "father says, father thinks, father does," — is constantly on his lips, and mother's ideas are considered visionary beside the father's large experience. There is no calling in which better opportunity is given to men to gain an influence over their children than the farmers, but he must himself be what

he would have his children. If he habitually addresses his dairy as though they were afflicted with original sin, and keeps about him men capable of compiling volumes of profane history between the pasture and the milking barn, to the utter demoralization of the cows' nerves, what can he expect of his boys?

He knows that a poisonous parasitic growth infesting corn has given its name, to language equally poisonous, equally destructive to the young and growing mind, he should guard his children from its smothering contact, teaching them himself the truths they must know in language sacred as his purpose. Boys ought to have a pleasanter home topic to discuss at school with their mates, than "how father drove a sharp bargain on a fellow, with an old, blind horse."

Happy the family that can look with loving reverence to a good father. Mothers have no right to a monopoly of influence, and the truth is, they never had it; the reason the world does not progress faster is because that fact has never been acknowledged; the preaching and advising has all been directed to the mothers.

Influence — the sacred right of influence has been awarded to the mothers as a kind of rebate for taking from them the trials and burdens of political life. But the women of this age love wisely, and will not accept alone the divine prerogative. They are calling to men from all civilized countries, saying: "Accept one-half this divine right of influence and let us take from your weary arms, your tired hearts, one-half your political burden."

In the reaction from the over severity of the past, in the relation of parent and child, there seems danger of going too far. Parents once believed in the natural depravity of the child, and treated it accordingly, much like a convict on parole; now they trust almost entirely to the innate goodness of their own and sometimes other people's children, though if they indulged in a modicum of the old time watchfulness they would see them rush in where angels fear to tread. The goodness of the modern child is subjected to too severe a strain; infants need protection and direction to guard them from that primary source of all sin, selfishness.

A late writer says, "I believe that the idea of duty is more potent for social improvement than the idea of interest; that in sympathy is a stronger social force than in selfishness. * * * The Mammon of injustice can always buy the selfish whenever it may think it worth while to pay enough; but unselfishness it cannot buy."

To redeem each other from the bonds of sin and selfishness is our work, the echo of that prayer uttered on Judean hills eighteen hundred years ago, "Thy kingdom come, thy will be done, on earth as it is in heaven," not with the meek and passive spirit of acceptance of the evils of life, but with the "unhasting, unresting" spirit of the destroyer of evil, the promoter of good; in hope, with justice, listing to the cry of the poor, interpreting for that dumb majority who are not representative men of any interest by virtue of intelligence, worth or public spirit, but victims of failure and hopelessness.

The strength of the state lies in the welfare of its weakest member. May we not all be employed in welding this chain of brotherhood? for we are called to work with heart, head and hand, to "work while the day lasts, for the night soon cometh when no man can work."

DISCUSSION.

Mr. Faville — There is one point I wish to speak of in that paper, a point I have realized ever since I have been old enough to know about it, and that is, that we lords of creation, ought to divide the responsibility and care of this great government with the ladies; and that for no reason, except because of the inherent right of the matter, the women of this country are responsible to this government in all other things, and why in the world should not they have a right to say what sort of laws it should have, and who should make the laws.

Mr. T. D. Curtis — I wish to heartily endorse every word of the paper, which this lady has just read. I entirely approve of the sharp criticism all through the paper, and I

wish we had more ladies who would come into our conventions and give us just such papers as this.

Mr. Philips—I think there is one point made in the paper that has not been thought enough of, by farmers especially. There is no class of men doing business who have more close relations with the help they employ. They are not only with them on the farm, but they are taken right into the house. And if you hire a man that swears, and take him into your family with your children growing up around you, or if you swear yourself, and kick your cows, you cannot be surprised that your children will do the same thing.

AMUSEMENT.

MRS. D. G. JAMES, Richland Center, Wis.

In considering this subject, we find the persons most actively interested are to be found occupying two extreme positions, while a vast number of parents and educators are all at sea and seem disposed to leave the important questions involved to adjust themselves, or what is worse, leave the inexperience of youth to define and limit their individual indulgence, hoping they will come out right, yet knowing that more lives have been wrecked in the pursuit of pleasure, than by all other combined causes. The persons representing one extreme, in their determination to be on the safe side, insist that all amusements are harmful or dangerous and unnecessary for any age or condition in life; a change of employment furnishing sufficient diversion. They are always referring to their own childhood, trying to make the new conditions suit the old theories. This position is much easier to maintain consistly, than to discriminate wisely between the different amusements. The advocates of this extreme have little or no influence, they are simply set aside by those they wish to reach and save.

The persons representing the other extreme, equally anxious to advance the best interests of society, keep open house, encourage amusements usually practiced in unsafe places, hoping to keep their friends from danger. They

welcome all alike without regard to character or habits, unless notoriously bad, expecting to help them by surrounding them with good influences. If they have any convictions or preferences regarding the lateness of the hour or the kind of refreshments served, they are not expressed for fear of giving offense and driving from them those they wish to help. They have observed the effect of uncompromising severity, and think to make amends by granting unlimited indulgence.

They make the existence of a propensity a reason for strengthening it. They feed and foster a love for amusement till it becomes a passion. The tendency of the times is to convert that which might be wholesome amusement into reckless dissipation before the participants find pleasure in it. In this respect those who live in the country have the advantage. The absence of excitement favors an undergrowth of small pleasures, and the visible return yielded for labor, in the response met with from animal and vegetable life, quicken the energies to renewed effort till the mind and body acquires a healty growth which renders exciting surface amusements no temptation. It is to this class of persons we look for great achievements. But even in the country the demon of unrest or, as it sometimes proves, the divine spirit of discontent enters, bringing discord or supplying a larger life to the farm home.

There are natures so constituted as to find life in the country unbearably monotonous because unenlivened by amusement, and no amount of authority that can be exercised will induce them to wheel into line. There is much said and written to convince young men and women that they should stay on the farm, and not flock to town or city for less remunerative employment, but unless more effort is made to meet their requirements socially, the farm will be tilled by foreign help.

There are many homes now in the country which, in evidences of comfort and refinement, equal any to be found in town, and the change, though mainly due to better times and a desire to keep the children at home, is largely the result of the more independent position now occupied by women as

factors in *all* the interests of home making. The same improvement will be observed in the national home when women have equal voice in its government.

Town and country people should exchange visits more frequently. The change would benefit both parties, particularly the children, who would learn to find more enjoyment in the home and less in public entertainments.

There is just enough left of the old idea of authoritative ownership on the part of the parent, and unquestioning submission on the part of the child, to make the confiding friendship that should exist between them, impossible, and accounts for the socially orphaned condition of many who frequent places of amusement.

The young are easily driven from us by irrational restraint. If we show by our sympathy that we appreciate their needs socially, and inform ourselves by actual observation concerning the attractions offered at public places of amusement, we can discuss with them the objectionable features intelligently.

Ignorance of outside influences is not a proper test of parental fitness to guide the young safely to a correct understanding of right and wrong where inclination is involved. "When the dweller upon the prairie sees the fire sweeping toward him, he does not fly out to fight it, he meets it half way by a back fire which vanquishes his enemy by the destruction of that which feeds him." The enjoyments of the younger and older people are essentially different, but would not be arrayed against each other if parents accustomed themselves to sacrifice their love of the chimey corner of time for outside interests.

Prof. Swing says, "animation is the only elixir that can confer perpetual youth," and the want of it is an indication of decay.

Reform in amusements, like other reforms, must begin at home. The parents who cultivate an intimate acquaintance with their children from infancy up, will be able to help them to a healthful development even in the matter of amusement. Right ideas are as contagious as evil if taught with equal energy. Public sentiment is not a far off, undefinable,

unreachable something, shaped by chance, it rests in every community and is molded to suit the requirements of the most active members of society. New demands create new supplies. The questions for the future can not be settled to-day, for the new days will bring their peculiar problems requiring solution; neither can the questions of to-day be answered by reference to the past. Educators must act in the living present or be helplessly side-tracked while the oncoming train passes by, freighted with the supplies which constantly changing conditions demand.

Mr. T. D. Curtis — This paper seems to me to treat of a subject of very great importance. In rearing a family myself, I have realized the difficulty in furnishing the proper amusements at home, and encouraged my children to invite their friends to come in or else go to some neighbor's house where they are welcome, instead of congregating in bad places. You cannot expect a child or young person, when they have got their chores done, to be satisfied to sit down in the chimney corner always, and the question of proper amusement for them is one that deserves a great deal of attention.

DAIRYING OF YESTERDAY AND TO-DAY.

By REV. S. B. LOOMIS, Lone Rock.

For all practical purposes the *yesterday* of any question is valueless, except to show how far on the road to the attainment of the highest, men have traveled.

On the question before this convention, yesterday is far back on the records of history, and "intimation strong as holy writ" makes the historic records pre-historic, blended in the mists that forever environ the childhood of the race.

History sends from the tent of Jessie, the watchful and patriotic youth David, to salute his older brethren in the camp of Saul, the king of Israel, with *ten* cheeses; to present to the captain of their thousands and to take their

pledge. How far those cheeses went in the solution of the question settled at Ephes-dommin, we have not time to speculate; or whether David partook thereof as a boy might, to give strength to his arm, or whether they helped to teach his fingers to fight we know not, but conjecture that if the "dairy interest" had not prevailed, the Philistine might have marched round his six cubits and a span whisking his spear-staff, which was like a weaver's beam, until this day or earlier; on such momentous causes slight effects are hung.

The Bible scholar should, therefore, venerate the antiquity of the cause calling together the people in convention, while the literati will please take note that at about the same hour in the day, of history, Homer was spinning his song for the listening world; we again conjecture, that men could not sing, even Homer, without cheese. Certainly not, if David could not get the Philistine under without (if not the staff of life) the crutch of it in his father's ten cheeses.

During the dark ages history was so taken up by minor issues, settling the succession, kings surveying the boundaries of states, making and unmaking kings, queens and drones, decorating knights, and settling the salaries of the reverend fathers of divinity; in short, take up in civil service reform that the weighty matters of how to feed the people were forgotten; how to place them, they always knew. How dark those ages must have been, such silence emphasizes.

To come down the steps of time to the dawn of the modern dairy within these realms, many it may be within these walls, will find themselves cotemporary; somewhere in the 30's we would locate the yesterday of recent date. To be sure, cheese had always been to a greater or less extent manufactured in a small way by small farmers, six, eight, and ten cow dairies. They filled a want, in exchange for tea, tobacco, possibly a little New England rum, but as a source of larger revenue the dairy had not become prominent.

Sometime near the time above mentioned, in the north part of the settled portion of Herkimer county, cheese-mak-

ing was resorted to as a main source of revenue, the country was cold, subject to deep snows holding into the lap of summer, corn could not be relied upon, wheat had become unprofitable, barley had found a larger area traversed by the new Erie canal and fallen in price, something else must be done on the ground, or the great west that men daily dreamed of then, must be reached in exchange for the familiar and sacred home acres. Those old hills flanked on the north by the visible Adirondac mountains, on whose lifted brows the baptisimal mists lay heavily, to be returned by fleets of clouds in frequent rains; the North woods came down to their pasture lands, across which the hunter travelled eighty miles or more, ere he touched the home of the citizen again. With a soil especially adapted to the grapes; on these hills men sought revenue from the dairy. The hills on the north of the classic Mohawk, rose gradually to 1,500 feet, and then spread out into a rocky plateau region of 3,000 feet above tide water.

Numerous streams of water run among the hills tributary to the East and West Canada creeks emptying into the Mohawk river. The formation of the soil on these hills geologically was the Utica slate, dissolving readily by the action of frost, and giving the very best foot hold for the grapes. Now, as we have said, was the modern dairy system commenced. The comparative success attendant on their new departure, led their neighbors to adopt on either side, and so the little cloud came to fill the whole land.

In 1838, a neighbor of my father's said, "I have mortgaged my farm for money to buy cows, I am going to dairying." The same year my father doubled his herd of twelve cows, they had heard from the north side of the river, visible from our south side hills. About that time the Elder Bursill and a man whose name if I remember correctly was Bates, appeared as buyers of cheese, a new phenomenon. Subsequently Doolittle and Perry appeared; cheese sold readily for from 3 to 4½ cents, and then the buyer occasionally failed and the price became nix. After a time cheese rose to the high water mark of six cents per pound for gilt edged. At that price my father said he would make a life

contract, but could get no takers; he lived to get the highest war price.

To make the best cheese was a commendable strife, and many were the experiments to reach a golden level. A. L. Fish read an essay before the state society of New York, for which he was awarded a premium, setting forth the substance of the present method, if I mistake not, of cheese-making in '48 or '49. That yesterday had a hand-rake and a hand scythe to keep company with the cheese basket and wash tub, changed into a cheese tub, the cheese press of yesterday was constructed of square timber loaded with cobble stone that ought to have pressed whey from a miser, but did not always and altogether from the cheese.

The cheese of yesterday were transported to market in the autumn of the year in casks of bass wood where from four to six had fellowship of themselves beside large families that were on perfectly good terms; the casks won the pseudonym of maggot coffins. That yesterday brought the bleak hills of Herkimer to be profitable to their owners, so profitable that a fortune would be required to buy a forty-cow-farm to-day.

The wife and daughter of yesterday were the cheese makers, dividing their time between the spinning wheel and cheese tub, between the cradle and the milking stool, the fittest survived; and, I believe, in as large numbers as now overcome the skating rinks and progressive euchre. Yesterday dairy cows were line back, brindles, and white faces and were estimated more for their *milk* than their *blood*, more for being Americans than for being either Dutch or British.

The dairyman of yesterday had *faith* in their own cheese that would span a whole twelve month for they knew there was no swine's flesh in them, that they were made *wholly* of milk. They did not own skimmers to any large degree, they were not yet grown wise as a serpent. Added to this *faith* there was *persistency* in finding the best markets, and a *laudable* pride in seeking to hold them by the quality of their goods.

The to-day of dairying is fast grounded on *methods* of

labor saving and *market securing* facilities, that are largely in advance of those of yesterday, in addition to which there is attained a *uniformity* of quality, that the consumer is measurably assured ere he tests it, that it will be cheese instead of chalk.

The duty of all that are interested in the future of the dairy system is to increase the demand, particularly the home demand. Chemists have declared cheese to be nutritious; experience has proven it. Our duty is to demand at all public tables that it should be served not in homeopathic doses to be nibbled, but as food to be consumed.

Your programme speaks of your essayist as a "venerable back member in cheese making," a slight mistake, had they written cheese consuming I would have been content. I have been but a "looker on in Venice," if you will allow such a *watery* suggestioned in connection with your craft; the subtle chemistry, the careful manipulation necessary to success has never fallen to so poor material, it has gone to better hands.

Still, allow the exhortation that success in cheese-making requires *honest* cows, cows that will not swallow frogs in their greed to get too much water, cows that abhor tallow from Texas steers and are Jews in their aflhorence of swine fat, they should be clean cows carefully and strenuously refusing to *give down* to the persuasion of the milker until their lacteal reservoirs are cleanly, cows that will kick over each and every pail of milk into which dirt has fallen. Our dependence is on the cow, for there is but little hope from the average politician that essays to do what we exact from the kine.

The above demand upon the cow to-day is to foreshadow the to-morrow when the cow shall own the man instead of the man the cow, when the sanctuary privileges of yesterday shall be forgotten in the longer exactions of the herd, when the social delights of the neighborhood shall be surrendered to the imperial call of Holsteins and lesser cattle. "Is a man greater than a sheep," or an imported cow.

The increase of the ten classes of the son of Jessie, are they not written in the chronicles of the census of 1880,

while the cattle on a thousand hills declare that to-day is far more abundant than yesterday, and exacts corresponding gratitude from this dairymen's association.

Convention adjourned to meet at 9 o'clock A. M. January 27th.

MORNING SESSION.

Convention met pursuant to adjournment at 9 o'clock A. M. Wednesday, January 27th, 1886.

Hon. Hiram Smith in the chair.

The Chairman — Our first paper this morning will be by Prof. H. P. Armsby, who is professor of agricultural chemistry at the state university. He has with much labor, worked out some feed problems that are of great value to the farmers. We are apt to think that farmers do all the work, but for the last two years I should not care to exchange with the professor. He does a great deal of work, making experiments, so as to get facts, not to guess at it as we too often do.

DOES RICH FOOD ENRICH THE COW'S MILK.

PROF. H. B. ARMSBY, Madison.

Mr. President, Ladies and Gentlemen — This subject of feed and its influence upon milk is such a large one, that I shall hold myself pretty closely to my text, and speak to you only of the influence of the feed upon the *quality* of the milk, and leave entirely to one side any question of its effect upon the quantity of milk produced, and as it is desirable that we should know just what we mean, when we talk about the quality of the milk, I will ask your attention in the first place to this set of samples, intended to illustrate the composition of average milk, as determined by the chemist. This bottle shows the bulk of one pound of milk, and these other six bottles show what that pound of average

milk is composed of. In that pound of milk there is about eighty-six per cent. of pure water, about four per cent. of fat, about three and a half per cent. of casein, the basis of cheese, a very little albumen (.2 of one per cent.), about two per cent. of ash and about four per cent. of milk sugar.

Now, when we talk of the influence of feed upon the quality of milk, we mean, usually not so much its influence upon the taste, the flavor of the milk, as its influence upon the proportions of its ingredients. That is, does rich food make any difference in the chemical composition of the milk? Does it make it any more or less watery? Does it cause it to contain any more or less fat or casein?

Having stated the question in this way, I will ask your attention in the first place to this table. I have selected these results from some trials made at the Experiment Station last winter, simply because they are results obtained near home.

PER CENT. OF FRESH MILK.

	Total Solids.		Fat.		Casein.	
	Observed.	Calculated.	Observed.	Calculated.	Observed.	Calculated.
Nibbie.						
Period I	15.92	15.92	6.15	6.15	3.44	3.44
Period II	16.65	15.61	6.35	5.95	3.50	3.42
Period III	15.92	15.30	5.96	5.75	3.31	3.40
Period IV	15.00	15.00	5.56	5.56	3.38	3.38
Sylvia.						
Period I	15.81	15.81	5.59	5.59	3.56	3.56
Period II	15.92	15.91	5.72	5.75	3.78	3.56
Period III	15.98	16.00	5.98	5.91	3.94	3.56
Period IV	16.10	16.10	6.07	6.07	3.56	3.56

These figures show the results upon two cows. Nibbie is a pure Jersey, and Sylvia is a high grade Jersey. Both are "standard cows." They were fed four different rations The first and fourth were substantially the same, and consisted of what hay they would eat, with seven pounds of corn meal and five pounds of bran per day, in two feeds,

with a very little clover ensilage as a sort of relish. In the second period they had instead of seven pounds of corn meal and five of bran, four pounds of corn meal, three pounds of new process oil meal, and five pounds of bran. In the third period we added on what corn meal we took off in the second, so that the grain ration consisted of seven pounds of corn meal, three pounds of oil meal, and five pounds of bran. In the fourth period they went back to the same feed as in the first. The milk of both these cows was analized for nearly every day of the experiment, over ninety days. The table shows the average composition of the milk for the last week of each period, when we may suppose that the effect of the ration had established itself.

The first column shows the per centage of solid matter in the milk. In the first period Nibbie's milk contained 15.92 solid matter; that is to say, the sum of all the ingredients, except the water. In the second period it ran up to 16.65; dropped again to 15.52 in the third period, and in the fourth to 15.00.

Sylvia's runs as follows: 15.81, 15.96, 15.98, 16.10.

Our third column shows the per centage of fat, and the fifth column the per centage of casein in the same way for each of the two cows in each period.

In the two middle periods the cows received what may be considered richer food, although they did not eat as much hay in these two periods as in the other two.

The per centage of total solid matter in Nibbie's milk in the first period was 15.92, and in the fourth 15.00, on the same ration. If, now, this ration had been continued through all the four periods, we may safely assume that the per centage of solid matter in the milk would have decreased at a nearly uniform rate from 15.92 in the first period to 15.00 in the fourth; that is, as a little calculation will show you, at the rate of 0.31 per cent. in each period.

In the second column of the table, under the head of "calculated" is shown what the per centage of solid matter would have been in each period upon this assumption. The fourth column contains the results of an exactly simi-

lar calculation regarding the fat, and the sixth column the same for the casein.

Now, if we compare what we may fairly suppose the composition of the milk would have been in these two middle periods, with what it actually was on a different feed, we shall get the effect of the change of feed. You will see in the second period that the percentage of total solids is a little over one per cent. greater under the influence of the oil-meal than in the first period. The fat too, shows a gain of about 0.4 per cent. That is, the fat actually found is 0.4 greater than that calculated, on the assumption that the proportion would have run down at a uniform rate. With the casein, on the other hand, the differences are very small. Now, the effect on the composition of the milk in this case was, that the richer feed in the first place increased the percentage of total solids. It made the milk less watery, by about one per cent. in this case, and it also increased the percentage of fat by 0.2 to 0.4 per cent. In other words, the richer feeding in the second and third periods made the milk richer. There was more solid matter in it; there was more fat in it. Let us compare these results with those of the other cow. As you notice, the observed and calculated percentages run very close together. There is a difference of only .02 to 0.05 in the solids, and at most of 0.07 on the fat. Here we have a striking illustration of the individuality of cows. The same changes of feed made Nibbie's milk richer in solids and fats and did not affect Sylvia's so far as these analyses show, except in the matter of the casein. Apparently the milk contained a larger percentage of casein than the calculated percentage, but I do not lay so much weight on that because the determinations of casein were less numerous.

As I said at the outset, I have presented to you the results of these particular experiments as an illustration of the effect of richer feeding upon the quality of milk rather than as a proof of it. The results of one single experiment like this are to be accepted with considerable reserve. But there are a large number of cases on record, chiefly as the result of German experiments, in which rich feeding has enriched

the milk, making it contain more solid matter and more fat, and as the combined result of all these experiments we may consider it proved that rich feeding, especially with feeds rich in protem, does usually enrich the milk.

Let me now ask your attention to this second table, which shows what the composition of this milk would have been if it had all contained eighty-five per cent. of water:

MILK WITH 85 PER CENT. OF WATER.

	Fat.		Casein.	
	Observed.	Calculated.	Observed.	Calculated.
Nibbie.				
Period I.....	5.79	5.79	3.24	3.24
Period II.....	5.72	5.71	3.15	3.29
Period III.....	5.76	5.63	3.20	3.34
Period IV.....	5.56	5.56	3.38	3.38
Sylvia.				
Period I.....	5.30	5.30	3.38	3.38
Period II.....	5.38	5.42	3.55	3.36
Period III.....	5.66	5.54	3.70	3.34
Period IV.....	5.66	5.66	3.32	3.32

The comparison of observed and calculated percentages in this table is made exactly as in the first table, and I think you will be surprised at the close agreement of the two sets of figures. With Nibbie there is a difference of only 1-100 per cent. in Period II, and only 13-100 per cent. in Period III, and those for Sylvia run equally close, and the same is true of the casein of Nibbie's milk, and I had that table prepared to show you this important fact, that the gain in the quality of the milk in that experiment was simply due to its being made less watery.

If you reduce it to a uniform percentage of water, then you find that the fat did not increase any faster than the other ingredients. In other words there was a gain of fat simply because the milk was made less watery. These experiments so far as they go, then show that by rich feeding you can make milk less watery, but that usually you cannot change the proportions of fat and casein to each other to

any great extent, and this conclusion like the previous one, is supported by the results of many other experiments. In conclusion, I wish to call special attention to one or two points. The first one is the difference between the effect on these two cows. Nibbie's milk was made less watery and Sylvia's was not. There is always the individuality of the cow to be reckoned with in feeding cows. Usually richer feeding makes the milk less watery, but not always, and of course there must be a limit to that. You cannot go on and make your feed richer, and richer, up to the greatest possible amount, and expect the water to keep growing less. There probably is a limit, depending on breed and individuality. The other point to which I wish to call your attention, is the fact that in certain cases, a one-sided increase of the fat in the milk is produced. Here we did not find anything of that sort, but there are a few experiments on record in which, by richer feeding, the fat has been increased faster than the other ingredients. There are, I think, only three or four such cases on record, and I think only two feeding-stuffs that have had this effect. Those feeding-stuffs are palm-nut meal and malt sprouts. With a few animals, these feeds have caused a one-sided increase in the fat of the milk, while with other animals no such effect has been observed. Here we meet again the important question of the individuality of the cow, but this branch of the subject has been so little investigated that I do not feel justified in taking time to consider it further.

Finally, to make my story short, you will notice that I have based all that I have said upon the results of chemical analysis. Now, that does not always determine the value of milk. To the butter maker it is not the total fat that is in the milk, but what he can get out of it in the form of butter which is of value, and the proportion of fat that you can get out of milk in the form of butter is one that has been very little investigated. A year ago we found one cow which showed some interesting results in this respect. When feeding her cotton seed meal, we found difficulty in churning the cream, we had to raise the temperature, and even then we got a considerable less proportion of butter

than we did when feeding the same cow on corn meal, while another cow standing beside her and getting the same feed showed no difference at all. I should like to take up that subject, and consider it in connection with what I have said, but at present our knowledge in this direction is so meager we are obliged to draw out simply conclusions as to the effect of feed in quality of milk simply from chemical analysis of the milk.

DISCUSSION.

Question — What time elapsed between the beginning of the first period and the end of the fourth?

Answer — Thirteen weeks. The experiment began about the first of February and extended until the second day of May.

Question — What kind of hay did those cows eat?

Answer — It was mixed hay, clover and timothy.

Mr. Hoard — You speak about individual differences in cows; by that, you mean, do you not, that cows have individual differences of proportion of butter fat, for instance to other solids, or casein to other solids?

Answer — Yes; and so far as these experiments have gone, there has been no change in these proportions with a change of feed. The experiments have shown this, that while you can make the milk less watery, and thus get more butter, as a general rule you cannot change the proportion of the fat and casein by changing the feed.

Mr. Hoard — Princess 2nd gave forty-six pounds twelve and a half ounces of butter a week. It must have been that her proportion of butter fat was larger than these we have seen. Is it your opinion that that same proportion exists where we usually get fifteen or twenty pounds of butter a week?

Answer — I should dislike to discuss that question. I have not experimented with that sort of cows.

Mr. Hoard — I want to get at this idea, whether you are convinced that feeding richer feed increases the proportion

of butter fat alone, or the proportion of butter fat, and at the same time that of all the other solids?

Answer — The latter has been the usual result. There are a few cases on record with particular feeds and breeds of cows, where the butter has increased somewhat with reference to the other solids of the milk.

Question — Did the cows give more milk in the second period than they did the first?

Answer — Nibbie gave less in the second period than in the others, and both cows ate considerably less hay in the two middle periods.

Question — Now, was that diminished quantity that Nibbie gave, equal or more than equal to the increase in the solids? That is, was the total butter production in the second period greater or less than in the first?

Answer — We got about the same total production, measured either as milk or as butter. We got a trifle more total solid matter and a trifle more butter from the second feed than the first. You are getting now to the question of quantity, which I did not propose to touch.

Question — In other words, the feeding did not pay?

Answer — Yes, the feeding did pay. You will find on the last page of this bulletin, No. 8 of the Experiment Station, the cost of feed per one hundred pounds of milk.

Question — How did you get at its worth? Did you sell the butter, or what did you do?

Answer — I don't give it any worth. I give the *cost of the feed* per one hundred pounds of milk produced. What it cost in feed to make one hundred pounds of milk containing eighty-five per cent. water.

Question — What do you pay for your feed?

Answer — That is assuming $8 per ton for hay, $2 per ton for a small amount of clover ensilage, $12 for bran, $20 for corn meal and $25 for oil meal, and the figures are as you see them there.

Question — That is simply the cost of feed?

Answer — Yes. The average yield of unsalted butter was the following:

AVERAGE DAILY YIELD OF UNSALTED BUTTER.

	Nibbie.	Sylvia.
	Pounds.	Pounds.
Period I	1.31	1.01
Period II	1.25	1.02
Period III	1.27	0.99
Period IV	1.09	0.98

The amount of milk required to make a pound of butter was as follows:

MILK REQUIRED TO MAKE ONE POUND OF BUTTER.

LAST WEEK OF	Nibbie.	Sylvia.
	Pounds.	Pounds.
Period I	14.62	*15.07
Period II	14.03	15.32
Period III	14.32	14.72
Period IV	16.08	14.72

*Third week.

Mr. Adams says the butter costs twelve cents a pound.

Prof. Henry—I wish to emphasize the fact that those cows were on one kind of feed for three weeks. Now, when a man is feeding a cow like that, and not allowing her to step out of the barn in that time, the natural consequence would be a decrease of the amount of product. And I think in criticising the cost of the feed, that should be considered. The Dr. couldn't do it any different in conducting his experiments. There is no animal so susceptible to change of feed as the cow.

Dr. Armsby — We assumed high prices for the feed.

Mr. Adams — I think that is a pretty good showing.

Mr. Hoard — It depends on the cows you put it into.

WHY WE CHURN—AND HOW.

BY MAJ. HENRY E. ALVORD, Houghton Farm, Orange Co., New York.

Mr. President, Ladies and Gentlemen: It is with great pleasure that I meet you on this, my first visit to Wisconsin. Several previous invitations I have been obliged to decline, and so was the more gratified to find myself able to accept this time. Although most of those present are personally strangers to me, I feel on joining this meeting like entering the house of a friend, so long and favorably has this association been known to me. Then, too, there are personal friendships to be renewed in coming to Wisconsin, because, besides officers of this association, whom I have had the pleasure of meeting before, there are in this state several young men who have been my pupils in years past, one now on his own farm, was with us for a year at Houghton Farm, as a farm pupil.

This Wisconsin Dairymen's Association is well known to us, in the East, as one of the model organizations of its kind. For years it has been written about at home and abroad, and regarded as the foremost dairymen's association of the West. It is especially noted as the first to establish a successful Dairy Show in connection with its annual meeting, and the first to adopt, a scale of points in judging butter and cheese; also for the promptness with which it issues its annual report and the uniform excellence of that publication.

It is the natural order of things for parents to be replaced by their children and for the former to be divided among the latter. The old American Dairymen's Association, the pioneer organization of the country, long so useful, has ceased to exist, and some years ago was decently buried by its friends. It is succeeded in New York, Vermont, Pennsylvania and Ohio, by active state associations. In a like manner it is undoubtedly true that the North-Western Association has passed its best days. In Wisconsin, at least, the State Association more than takes its place, and the time

has nearly arrived when the North-Western should be honorably retired.

State Associations now take the honors of the day, and it is unquestionable due very largely to the influence and exertions of the organization here represented that Wisconsin butter and cheese have attained the reputation for high quality which they now enjoy, and which I trust they will long maintain.

Coming now, gladly, in response to the last invitation of your officers, I do so with no intention of burdening you with any long lecture, or address, but rather to join generally in the discussions of our meeting. I have agreed, however, to especially contribute one fragment to the proceedings, in that branch of dairying to which I have given the most attention and in which I have certainly had the most practical experience.

In the business of butter-making, one of the interesting and most disputed questions, is: *why we churn, and how?*

For the proper discussion of this question, we must consider at the outset, the nature of the material we churn, whether it will be milk, or the cream of it. Butter, our aim and object, is a collection of the fats of milk. The process of butter-making, from the moment the milk comes into our possession, is simply to get these fats separated from the milk and collected into the form of butter.

The physical condition in which the fats are found in the milk and their relation to the other milk constituents, has an important bearing on our mode of procedure. The old idea, generally accepted, and still maintained by many, was that the little particles or globules of fat were each covered with a menbrane or at least a film of an albuminous character. It has ever been a more or less disputed point, however, whether the butter fats were in the form of sacs, little covered balls, or merely free globules of fat. Evidence is accumulating in favor of the free globule theory. The ruptured and empty sacs, which some of us honestly believed we had seen, are probably myths. It is doubtful if any such sacs exist. For one, I am pretty well convinced by the evidence presented, that milk is simply an emulsion — that is

a mixture of water and globules of free fat, the latter held in form and the emulsion preserved, by the presence of casein and other matter in solution, which makes the liquid viscid.

It has been found by experiment that various animal and vegetable oils can be mixed with water and broken up into minute globules of fat, quite evenly distributed through the water, forming true emulsions. Thus liquids can be made closely resembling milk and which act like milk. For a time, and while gently moved, the emulsion is preserved. If left at rest, gravity acts to bring the fats into a mass at the top like cream. And by churning, the fats can be gathered into a kind of butter. In these and other ways, such artificial milks or emulsions, act so very like true milk, that reasoning by analogy, there is a strong argument that cow's milk is simply an emulsion.

If this is true, there is one important clue obtained to churning aright. If there are no sacs to rupture or break, there is no need of the violent beating which was given milk and cream, in former days to compel the butter to "come." Milk being a simple emulsion, and acting like other emulsions made by experimenters, all it needs is gentle agitation, under favorable conditions, to cause the fats to collect and form butter.

Here we have corroborative testimony, in the changes which have taken place within a few years, in the style and action of churns. These radical changes surely have not been the result of mere whims, theory or fancy. Even if the reasons have not been known, there certainly have been reasons for these changes, and they now appear philosophically correct. The theory of milk as an emulsion is sustained by the practical results which fully justify the substitution of empty barrels and boxes for churns, in place of the old beaters and dashers.

The highest qualities of grain and flavor in butter are obtained by the least possible disturbance and change of the fat globules of the milk in the processes of butter making. Gentle means are wanted to collect the butter fats. Hence, for quality I believe in creaming by the old, quiet, gravity

method, rather than by the use of centrifugal force, and in churning by gentle agitation. Let me be understood as referring to quality alone, in the opinion that cream obtained by "setting" is better for butter than that from forced separation. There are two sides to this question, and in practical results it is probable that economy will favor the centrifuge.

Churning cream has been assumed as better than churning whole milk. The latter is favored by some, but creaming before churning is plainly more reasonable. There are a few arguments which can be presented for churning whole milk, but all do not overcome the single objection that there is no skim-milk if this system is followed. In the economy of feeding young stock, and indeed in domestic economy, as well as most markets, butter-milk will not take the place of skim-milk, especially sweet skim-milk.

If, as now seems probable, scientific investigations fully justify gentle agitation of cream as the best method of getting butter, for really we only *get* the butter from milk and cream, we do not "make" it. Other questions remain as to the best conditions under which to do the gentle churning.

Temperature is a most important factor in churning. The old fixed rule upon which our dairy thermometers are made, of 62 degrees Fahr., as invariably correct for churning, is manifestly absurd. Agreed that this is better than the "finger test," it nevertheless won't succeed in many cases and cannot be expected to. The study of churning milk, cream and various emulsions at various different temperatures has been laboriously conducted by Dr. S. M. Babcock, Chemist of the New York Agricultural Experiment Station, with very interesting and useful results. It is found that if the temperature is too low, the fat globules harden and their tendency to adhere or collect is steadily reduced. Little butter is obtained by the most persistent churning at a temperature of 50 degrees Fahr., or less. The longer one churns at such a low temperature, the farther away the cream will be from the butter form. If the temperature is too high, up towards the melting point of the fats in hand, the globules are found not to break, but to divide and divide again, retaining their

spherical form but becoming smaller and smaller. The cream then froths and foams, but the fats, by repeated divisions, are constantly moving away from the butter form and making a finer emulsion. Little butter is ever obtained above 80 degrees Fahr. The churning limit is practically between 56 and 70 degrees Fahrenheit. Within these usual churning limits there is still room for much study.

Different temperatures are required for successful churning of cream from cows of different breeds, from different cows of the same breeds, and from the same cow at different seasons and under varying circumstances. The physical character of butter and the melting point of butter fats vary with the season and the milking period, and are affected by other causes.

Experiments *indicate* that there is some law of relation, yet undefined, between the melting point of the butter fats in any given lot of cream, and the right temperature for churning *that* cream. In milk and cream where the fat globules are very large, the melting points of the fat is relatively high. In the butter from pure Jerseys, for example, the melting point is very high, and in the market this butter is said to "stand well." Cream of this character, we know, bears churning at a higher temperature than is usual.

Dr. Babcock is now giving this matter close study, and there is reason to hope that he will pretty soon be able to give us a better answer than we have ever yet had, to the oft repeated question, "what makes the butter come?" If this point is determined, it will be a great advance to our knowledge of the philosophy of churning.

Let me partly repeat what has been said, as I close these remarks. The weight of evidence is now largely in favor of the belief that milk is an emulsion, holding the animal fats which we ultimately collect as butter, in the form of free globules. Milk itself is so complex a substance, that if it is an emulsion, we have a right to expect much light from studying the characteristics and behavior under manipulation of other and simpler artificial emulsions.

The globules of fat in milk vary greatly in number and size. Generally speaking, some breeds of cattle produce

milk with larger globules than others, and the larger the globules, the better the animals as butter makers, and the easier and more economical the separation of the fats from the milk and their collection into butter. But in cows of the same breed and closely related, both size and number of globules are found to vary, and to be charged in the same cow with changing conditions.

This globule of fat in cow's milk, of which we are talking, is a very small thing. Strung along in a row and touching sides it would take at leat 2,000 of the largest size to cover an inch, and in this length there would usually be from 5,000 to 8,000 of them. There are from one to four *trillions* of these globules in a quart of milk. To be more exact, in a herd from which the milk has been closely examined, the range was found to be from 105 to 367 globules, in .0001 cubic millimeter, or 1,050,000,000,000 to 3,670,000,000,000 to a quart.

Studies in this line require so much time and patience and such complete appliances, that my own facilities for such work has been limited and I prefer to rely upon the far more complete records of Dr. Sturtevant and his chemist (Dr. Babcock) at the N. Y. Agricultural Experimental Station. My own experience, however, conforms to the conclusions there reached.

They found at Geneva, with one exception, the largest globules in the milk of a Jersey cow which tested 21 lbs. 2 oz. butter in seven days; but this cow's milk contained fewer globules than any other in eleven cases, with one exception. And the next largest globules, were in the milk of a cow making 19 lbs. 10 oz. of butter in seven days, the number of globules to a given bulk of milk being also comparatively small, in this case. And per contra, the cows which were the poorest butter producers, had the greatest number of globules in a given bulk of milk, these being also smaller in size than any others examined.

Where a cow was milked irregularly, the fat globules were more numerous after the shorter intervals between milking, but when the same cow was milked with regularity and kept free from disturbing influences, her milk was extremely uniform in the number and size of its fat globules.

The practical deductions are that for large butter products we should select animals whose milk is characterized by large globules. And that for evenness of product, great regularity and careful treatment in general, is important.

There is no better indication of a good butter cow than the quick separation of the cream from her milk when "set" in the usual way; this is the result, generally, of large fat globules.

In butter making — or rather in butter *getting* — the whole object of our dairy operations is to secure these little invisible globules of fat. We want them free from the serum of soluble casein and sugar salts in which they are held, and hence resort to different methods of separation.

Finally, we churn, by gentle, constant, regular agitation, under such temperature and other conditions (still somewhat uncertain) as will bring the little globules in contact with one another, freed from the surrounding fluid, so they will gradually adhere. This process of adhesion once begun in the churn, it proceeds until the globules, invisible, microscopical at first, have united in masses sufficiently large to be seen. Then we say, the butter has "come," or begun to come, and the globules have collected into granules.

In this form we can, for the first time, see and handle the butter. And with our greatly improved churns and the high degree of skill acquired in their management, we are able to produce the beautiful golden grains, of almost any size desired, but uniform and firm, as in the fine samples of granular butter exhibited at the convention.

Now "the butter has come," my task is done!

DISCUSSION.

Mr. Hoard — The major says gravity creaming is better for the quality, I would like to have him amplify a little into the philosophy of that.

Answer — Not only do we find that the butter is better and easier obtained from milk where the fat is in large globules but we find that in milk where the globules vary

largely in size, we get a better article of butter from the largest globules in that milk. They come to the surface of the milk first in the ordinary gravity process; in all milk there is a large proportion of very minute globules of fat which are inferior in quality, as whey butter is inferior to ordinary churn butter. In the process of gravitation I have in my own dairy been able to make from the same milk three distinct marked qualities of butter, so that a person entirely ignorant of the manner in which they were obtained, believed them to be from different cows, a different manufacture entirely; these being from the first and second and third skimmings, the third skimming as we call it, in that case, held the smallest globules and was inferior in quality to the butter from the first skimming; those three mixed together of course were not as good. That was tried the same time and found to be so in practice, it was not as good as the cream of the cream. But of course commercially we cannot afford to do it. But when we get large quantities, then the question of our market comes in, and it is a question with me, which is the best for me to make from a given quantity of milk, ninety pounds of butter for which I can get the highest price, or to make from that same milk one hundred pounds of butter, and shave my price a little.

Mr. Hoard — I understood you to say that souring was a step towards decomposition. Does oil decompose by fermentation?

Answer — You have me there in one way. The pure fat remains there an almost indefinite time unchanged, with the exception of the volatile oils, which, in the butter are essential, for there is the flavor of the butter, and there is where I believe we loose in flavor, and that is one of the best points in quality, of course. By holding our cream too long, we allow, not the fat itself to decompose, but we don't have the fat pure, we have an everlasting mixture of these things, and that is what plays the mischief. In the fermentation of those other ingredients the flavor is hurt.

Mr. Hoard — Can you get the full amount of butter from cream which has not become perceptibly sour?

Answer — I think not, sir. That is the very point that we have, between the separation by the gentle gravity method and the forced separation.

Question — Can you come at that better by churning the sweet cream at a lower temperature?

Answer — We always do churn sweet cream at a lower temperature, varying from 58 to 62 degrees. I have churned sour Jersey cream sometimes up to 68 or 70 degrees with satisfactory results. But I cannot treat a mixed cream in that way.

Question — You say the quicker rising of the cream indicates the larger globules. Now, if we are to have animals that throw the larger globules, suppose we have either Jersey or Ayrshire cows; one is noted for large globules, the other for small, now isn't it a question of handling? If we used the same skill in handling the small globules as the large, wouldn't we find the animal just as productive?

Answer — You ask me whether equal skill cannot get as good butter from an Ayrshire cow as a Jersey cow? I do not think you can. I think the quality follows the physical character of the milk. The larger globules of milk give a better quality of butter than the smaller. I do not see any point on which we are ignorant, which would affect the quality in such cases.

Mr. Curtis — Have you any theory why the small globule is not just as rich and valuable as the large one? Why is it inferior in quality?

Answer — Well, this, that the larger the globule, so far as we have examined, the higher the melting point.

Question — Why is that?

Answer — I cannot say. If we go into other kinds of animal fats we shall find that where they appear in the body in a larger form than they do in milk, the melting point is still higher. The indications seem to be that one of the attributes of high flavor, high quality, seems to be a higher melting point which belongs to the larger globules.

Mr. Hoard — As I understand you, and we all believe this is a question of gravity, the coming of the butter fat globules to the surface, as you very well state, the size of the

globule instantly produces a disproportion with the surrounding.

Mr. Hoard — There is sometimes in milk a peculiar viscidity. Have you ever discovered the more acid the milk was, the more reluctant and stubborn the rising of the cream?

Answer — Of course, and that is just what makes the Ayrshire milk the best for the farmer. It makes the Holstein next to the Ayrshire in difficulty of separation.

The Chairman — You spoke of volatile oils. Have you, in your experiments, found any way or system by which you can retain the aroma of butter that we are all seeking after? After the butter is made is there any secret of retaining that aroma, or does that naturally go, sooner or later?

Answer — Diminish as much as possible the surface of the complete butter exposed to the air by impervious wrappers. If it is in print form, of course it deteriorates much faster than butter in tubs, unless it is wrapped in an impervious paper. I think the best way is to consume it before we lose the flavor.

Mr. Dexter — It seems to me that it is probable that we get better butter from the larger globules, because our process is better adapted to it. It is entirely possible that the smaller and larger globules are precisely alike, only our processes will not produce the same results.

Answer—There is the physical fact you have got to contend with. Let me state this: Suppose we have a certain bulk, of course very minute, in the form of a single globule, which we are handling to make butter, and suppose we have another class where it takes ten times that number of globules to form the same bulk of cream. Now, the surface of these ten globules which come in contact with the soluble casein and sugar is very much greater than the surface of the one globule, and the difficulty we have to contend with in making butter is to get those globules together without holding with those as they attach to one another the serum of casein and sugar and salts in the little interstices that occur between them. The danger of holding this foreign matter is very much greater with handling a large number

of little spheres, than it is with handling a smaller number of large ones. I cannot conceive of such improvements in the methods as will make it possible to get along as well with the little spheres as the large ones.

Question — Have you found difficulty in the results by churning when the cream has great variations in the number and size of globules in the same cream?

Answer — Yes, sir

Question —And you obtain less satisfactory results with a lack of uniformity than with a uniform size?

Answer — Certainly.

Question — Have you any experience as to whether the different kinds of feed, or the proportions of feed affect the size of the butter globules?

Answer — Indications, sir; that is all.

Question — But you believe it to be more inherent in the character of the cow?

Answer — I do; I believe it is more dependent upon breed than feed.

Question — More in the same breed than upon individual characteristics?

Answer — Decidedly more so.

Mr. Hoard — In different ages of cream mixed tegether, isn't there a difficulty in securing a uniform condition of ripeness, so as to prevent the running off of unchurned cream into the butter milk? Will not one portion of the cream come to butter before the other, and when it does come, does it not disperse the unchurned portion in the buttermilk?

Answer — I think you will agree with me that there must be a time in the age of cream, dating from the time it came from the cow, when it is in its best condition for churning. Now, if we take the cream from Monday morning, from Monday night, from Tuesday morning, from Tuesday night and from Wednesday morning, and wait for Wednesday morning's milk to be in that correct condition, we will get a long way from that stage in Monday morning's milk. We are in the same predicament if we have the cream from three consecutive milkings, or relatively so. In other words

it is only by having the cream of a single milking, that we can obtain the ideal age at which we churn. Hence that is the very reason why the man or the factory that churns every day, or better still, from every milking, at what he believes to be the best time, gets better results than the one who churns only twice a week.

Question — If your Jersey cow was moved to Delaware or the Lower Susquehanna, would her milk be the same? That is, does the feed and the soft water change the richness and aroma of your butter?

Answer — I have no doubt of a change in the aroma, which comes from the volatile oils, and not from the substance of the butter from feeding. We can flavor butter as we know with cabbage, or onion, or clover, or aromatic herbs, by feeding the cow on these things, but the physical character of the cow's milk, not alone its flavoring quality is inherent in that individual, no matter whether she be in Illinois or Canada, is respective of feeds. As to the size of the globules of her milk. If she is a large globuled cow, she is so, no matter how or where she is fed. The highest percentage of cream we ever got anywhere was from a cow that almost died of starvation.

WHAT IS A FAIR RETURN PER YEAR FOR A GOOD COW, AND CAN WE AFFORD TO KEEP ANY OTHER?

BY C. R. BEACH, Whitewater, Wisconsin.

Mr. President: Our secretary has limited us to one thousand words each. I think he must have been reading Josh Billings, who said, "he did not care how much a man talked if he didn't use but few words." Well for one I am glad of it, I have always claimed that the man who could not tell in fifteen minutes all he knew about any one thing, knew too much. The subject assigned me is to answer to the question, What is a fair return per year for a good cow, and can we afford to keep any other?

I was not present when this programme was made, and can therefore only conjecture what is expected of me, and I

confess that I have lain awake several nights trying to determine. That word *return* is what bothered me. It would seem to imply that something had been furnished for which something in return should be given in payment. And I could not for the life of me determine (nor have I yet) whether I am to tell how much the cow should return to the owner, or how much the owner should return to the cow. Well I have concluded that it will make but little difference which way we understand it.

The cow, if she is good and honest, will return a hundred cents on a dollar for value received. And the owner, if he be wise enough to consult his own best interest, will see that she be placed in such surroundings and furnished with ample means for doing so.

The days of mythology and of miracles have passed. The goose that daily coined an egg of gold out of her own organism, has migrated to land from which she will never return, and the cow that can generate butter out of her inherited tendencies has not yet come to take her place.

If a ton of hay contain only the elements for a thousand pounds of milk, no trick of legerdemain can squeese two thousand pounds out of it. But probably by that word return is meant income, and I am requested to answer to the question: "What is a fair income for a year from a good cow?" In answering the question in this form we must apply the same tests we use in determining the probable income from any other business venture.

How much capital has been used, and how much labor performed?

The interest on capital and the price of labor are the only two elements that enter into what we call cost; and he only gets *fair* returns who receives back the full cost of his venture. It makes no difference whether it be a pound of butter, or a pound of tea, a horse or a locomotive, a yard of cloth or a bushel of wheat, a rod of ditch or a newspaper. The price of each represents the interest on capital used and labor necessary to its production. The per cent. of interest will be determined by the risk involved and the price of labor by the skill required. It is upon this very point. *The*

application of business principles to our farming operations that we as farmers fail more than upon any other. We seem to forget that the cost of our farm products is determined by the same law that governs each and every other productive industry. I know it is claimed (and with much truth) that farmers cannot forecast with any certainty what will be the cost of their products. The rain or the drouth, the tornado or the frost may upset all calculations.

But all business has its risks, everywhere.

"The best laid plans o' mice or men
Gang aft a-gley."

But if the application of business principles does not always insure success, it will at least show the reason of failure.

But this much may be said of dairying that in no other branch of farming can we estimate with so much certainty our probable income.

But to return to our question, what is a fair return per year for a good cow? and in attempting an answer I shall only consider it from a butter-maker's standpoint. W. D. Hoane is my authority for saying that 844,505 cows in the state of Iowa produced 60,670,645 pounds of butter, or seventy-two pounds per cow. That according to the census returns the average, per cow, of butter in Wisconsin is eighty-one pounds per year. I can but hope and believe that errors somehow crept into these reports and that they are too low or at least below paying amount and therefore cannot be considered as fair returns. But before giving some estimates in figures which I have made, I will say that after considerable study, I have reached the conclusion that where lands are worth fifty dollars per acre the butter dairyman, in order to get fair returns for interest on capital used, and labor performed, will need to realize not less than fifty dollars per cow. Which, at last year's prices, will call for about two hundred pounds of butter. He may produce less and still lay up money, for the reason that he may live on a sum less than a legitimate income from his investment; but fifty dollars per cow I consider about the minimum of

fair returns. Larger returns may be realized, but I shall not attempt at this time to determine the maximum of profits. We know that all animals have a limit to growth and power of production, which limit they cannot by any forcing be made to pass, and the nearer you approach that point the greater the cost. It cost more feed to make a pound of butter from Princess 2nd when upon her trial tests than to make a pound from a cow making seven pounds per week.

During some tests made at the university farm last winter, several cows were fed daily fourteen pounds of hay, five pounds of corn meal and seven pounds bran. They gave about twenty pounds of milk each per day, from which was made something over a pound of butter.

I have referred to this simply because I consider it a good, fair winter ration for a dairy of cows giving milk. If they would eat more hay I should give it.

I shall use these rations as a basis of my estimates. And here let me say that in my opinion every dairy cow should go dry not less than sixty days, and ninety would be better. Every living thing, and even the earth itself needs rest to recuperate. Our winters require that cows be kept in stable 200 days. If we feed:

14 pounds of hay per day for 200 days, 2,800 lbs., at $6 per ton	$8 40
5 pounds of corn meal per day for 200 days, 1,000 lbs., at $20 per ton	10 00
7 pounds of bran per day for 200 days, 1,400 lbs., at $1 per ton	8 40
5 pounds of bran per day for 100 days, 500 lbs., at $1 per ton	3 00
Pasturing	6 00
Interest and risk on cow at $50, at 10 per cent	5 00
Making the cost of keeping the cow a year	$40 80
For labor in milking and making butter and care of cow	15 00
Total	$55 80

For this $55.80, if she is a good cow she will give 20 pounds of milk per day for 200 days, and for 100 days she will give 15 pounds per day, making 5,500 pounds of milk.

If you can so plan that this cow gives most of her milk in the winter, 24 pounds of her milk will make a pound of butter, equal to 230 pounds, which at this year's price (24 cents) will bring $55.20, while the sour milk and calf will be

worth not less than $8, making $63.20. She can be made to do better, but I am only asked to say what is a fair return. Do I hear some of you say, "that these figures are chimerical." I trust I will be allowed to make a few confirmatory statements. In the patent office report of 1861, Ladoe Pratt, of Prattsville, New York, reports that a herd of native cows made in a season of about eight months, 217½ pounds per cow, which with the slops fed to hogs averaged him $56.49. The butter was sold at 23 cents. During the summer the cows were fed on pasture alone.

In the *National Live Stock Journal* of March, 1879, there is a report from eight dairies in Western New York. The whole number of cows reported was 117, with an average yield of 257.62 pounds per cow. R. S. Houston of Kenosha, of our own state reported for the year 1878, a yield of 293.4 pounds per cow for a herd of 50 cows. Were I at liberty to do so, I could name six or eight dairies in the counties of Walworth and Jefferson whose average yield will excel my estimate.

In the year 1881 I paid my neighbor Hezekiah Lewis $821.69 as the product of the milk of 14 native cows, this was the net proceeds after deducting the price for making and marketing the same, he having the sour milk which would make his income nearer $70 than $60 per cow. You will also allow me to state that my own income from a dairy of about 30 cows during the past year with the low price of butter and that sold in the open market, through a commission house, has equaled the figures I have named.

So much for the first part of my question. But I shall not have performed my task without saying a few words upon the last. Can we afford to keep any other than good cows? I suppose that I am expected to answer *no*; but I shall do no such thing. We have none to many cows in the state, and if all the cows that don't give good fair paying returns were disposed of, I am afraid there would not be enough left for seed. But I have observed that the poor cows were generally owned by poor dairymen. Whether this happens by a special interposition of providence, or whether it results from the law of natural affinity I am unable to say.

But if anyone has a dairy of poor cows, or any number of

cows, if he will for a year put them on extra rations he will be surprised to find how few he has to discard.

We need first to improve ourselves by getting clearer and juster conceptions of what our best interests require of us, and we shall have less reason to complain of our cows. And until we do so we should fail with the best cows in the world.

The question then of what kind of cows we shall keep, will depend upon what kind of dairymen we are.

I once heard a man in a game of bluff, offer that if anyone would furnish him with twenty poor cows between the ages of five and 10, none of them kickers, and none of them hard milkers, if he could not make from them in a year 200 pounds of butter from each cow, he would pay $50 a piece for them on condition that if he did he should have them for nothing. I felt at that time like backing him, and think I would do it yet. But for all that there is just as much difference in cows as in men.

The last year has been of short production and low prices in all branches of farming, and dairymen have suffered as well as others, and I hear some claim that it were better to sell the cows and do something else. No one can tell another what he better do, and my subject did not call for any advice from me; but were I inclined to give any, I should say don't.

Butter and cheese will always be wanted for the world's consumption, and we in Wisconsin can furnish them as cheaply as any section in the world. Low as prices have been, I claim that there is not a dairyman in the state had he done as well as he might, that could not have shown a fair balance sheet. The fault has been in ourselves and not in our start, if we have failed to make money. Low prices are not always disasterous to business; they may be made to be the means of its advancement. My father used to say that corn needed cold weather to make it grow at the root.

I do not forget that the butter dairymen are confronted with the problem of fraudulent butter, but I for one feel in no sense discouraged on that account. The whole country did. I might say the whole world is too much stirred up to let the matter rest where it is. And the result will be that

all imitations or substitutes will have to stand on their own merits. If the world decides that imitation butter is good, that it is preferrable to genuine butter, and that it wants it, there can be no class that can furnish a better article, or sell it cheaper than the butter dairymen.

But until such verdict has been rendered, and confirmed and ratified, let every dairyman as he values his reputation as a man, and his honor as a dairyman, and now, O, preacher, I should add, as he values his soul's salvation keep his hands from the accursed stuff. It was claimed by the butterine men during the discussion of their admission to the Fat Stock Show, that there were thirty-eight creamery men who were using their materials. But until they substantiate their claim by naming the parties, I for one will not believe it. But if there be but one such, let the curse of Macbeth's witch rest upon him.

"Sleep should, neither night nor day,
Hang upon his pent-house lid,
He should live a man, forbid,
Weary sev'n-nights, nine times nine,
Shall he dwindle, peak and pine!"

You will also allow me to state that my own income from a dairy of about thirty cows during the past year, with the low price of butter, and that sold in the open market, through a commission house, will equal the figures I have named. The year just passed has been one of short products and low prices in all kinds of farming.

But I have wandered from my subject and I am afraid I have used more than a thousand words. If I have, I have told you more than I know.

Allow me, then, in conclusion, to say that under the surroundings of the average dairyman of the state, fifty dollars is a fair return for a good cow a year, and that the fair average cow of Wisconsin, if treated fairly, will yield such income. If any one who from his past experience feels confident that he can do justice to any of these improved breeds, let him, by all means, get them.

DISCUSSION.

Mr. Hoard — Mr. Beach, you spoke of the greater cost of Princess Second's butter, when making the amount that it is alleged that she did, I think there is a chance there for misleading judgment, and I wish to state an experiment of Prof. Henry. He took three cows; to each one of the three cows he gave the same rations in the cost of feed: namely, seventeen cents per day. For seventeen cents one cow gave him one pound and two ounces, for seventeen cents the other cow gave him one pound and nine ounces, and for seventeen cents the third gave him one pound and fifteen ounces. Now then, was not the pound and fifteen ounces made at less cost than the pound and two ounces?

Mr. Beach — That cow was not pushed to her utmost limits. What I claim is that there is a point by which you cannot pass. There is not much danger of our getting our cows up to that point, but the true yield is above the minimum yield, but as you advance above that, there will be a point beyond which you cannot pass.

Question — It depends upon the cow, doesn't it?

Answer — Hoard is authority on that matter.

Song — "America," — Mr. Jules Lombard.

Convention adjourned to meet at 2 o'clock.

AFTERNOON SESSION.

Convention met pursuant to adjournment at 2 P. M. Hon. Hiram Smith in the chair.

VALUE OF RED CLOVER AS FEED FOR HOGS AND CATTLE.

By STEPHEN FAVILL, Delavan.

This is the subject assigned me by our executive committee. I wish they had given me a little more latitude and allowed me to speak briefly of its value as a fertilizer as well as of its feeding value. I will trench upon my orders

so far as to say that when there is not a good supply of manure I regard the frequent sowing of clover an absolute necessity for any one that would maintain the fertility of soil. By frequent, I mean the sowing of clover seed always when any small grain is to be sown, even if the land is to be plowed again in the fall. The fall feed will much more than pay for the seed beside the roots left for fertilizing. But I would not recommend plowing it up in the fall, but leave it and mow one season (two crops) and then plow for corn. This would give a three year rotation of crops, which I think the better plan, as in that way we are securing the best results from the clover as a fertilizer and at the same time furnishing ourselves with good feed for all kinds of stock.

In regard to the feeding value of clover very much depends upon the time it is cut and the way of handling after it is cut. If left to stand till nearly or quite ripe before it is cut and then dried in the sun, it is of little if any more value for fodder than pea straw. While if cut when it is green and cured in the mow it is second only to well cured corn-fodder, and only second to it in the making of milk. For fattening stock it stands at the head of the list of all our hay crops.

I know that many of you are ready with your questions in regard to curing in the mow. I will give you my way of doing, but would say I am not always able to to do as I would like to, but am compelled by the weather to do the best I can. But on the supposition that we are having an average amount of fair weather, my plan would be this. I have said above, cut when it is green. I mean by that if one has much to cut, commence the haying as soon as one-half is in blossom (not wait as was the old plan till all was in blossom and half of the blossoms turned brown). Never commence cutting in the morning till the dew is off. Cut until noon, then if you have a tedder stir it until about four o'clock. Then rake and put into large cocks, be sure it is all done before the dew begins to fall and while the hay is warm, and it will commence to heat very soon, and by the next morning will be quite warm. Then, if the weather is fair throw

open a little while and put into the barn as fast as possible. I shall be asked just here if it won't heat and spoil. I answer yes to the first and no to the second. It will heat and that is just what we want it to do. The heating to about 135 degrees seems to bring about some chemical change that makes it more palitable and better feed. In regard to its spoiling; if there is no foreign water in it, nothing but the juice of the grass, it won't heat enough to hurt it. But if caught with a rain upon it after it is cut, care must be taken to dry the water out. If one has a large amount to cut and wants to drive business faster, this can be done by mowing in the forenoon. You can run the mower from 4 o'clock to half-past six in the afternoon, and then it can be teddered in the next forenoon, wilted and put in the barn. I want to say just here the tighter the barn the better. But an ordinary battened barn will do if the doors are kept shut after the hay is in. It is a good plan after your clover is all in to put a load of straw on the top. This will save hay. If it is not done some of the top of the mow will be spoiled. As I have said before the hay will heat and the hot steam as it rises and comes in contact with the cooler is condensed and falls back, and will wet the top of the hay, and as far down as that moisture goes the hay will be spoiled. Hence the good of the straw to catch the moisture. It will not do to put clover in the stack without more curing than I recommend for putting in the barn.

If my limits would allow (I am limited to one thousand words) I would like to say something of the philosophy of this way of doing, but will only say it is something on the principle of the silo. The clover is put in so green and heavy that it is packed by its own weight so closely together that it excludes the air and so can't burn. I have already indicated my thought in regard to the value of red clover as food for the farm stock to which usually feed hay, but have said nothing of its value as feed for hogs. The profits of pasturing hogs on clover will readily be seen when we remember that an acre of average clover will pasture eight hogs and if extra good will pasture ten, and if the hogs are eight or nine months old and have been fairly well wintered

will put on one hundred pounds each if fed nothing else, but I would advise keeping them entirely on it, but recommend a small feed of corn once a day, feed early in the morning and regularly. Hogs are creatures of habit and will soon get to look for feed only at the regular time. Of course the profit per acre will depend entirely upon the price we get for our pork. But say four dollars per hundred which is as low as it has been the first of September in a good many years and say eight hogs to the acre and we have thirty-two dollars as the proceeds from the acre. More than we can get from pasturing any other kind of stock that I know of. This is no guess work. Two years ago (our clover all killed out last year) we turned fifty hogs that would average one hundred pounds onto eight acres of clover and sold them the first of September and they had gained enough over one hundred pounds each to pay for one pound of corn for each hog daily, that being the exact amount fed. The hogs did not eat all the clover from the eight acres, but three times during the summer we turned in the cattle for a couple of days to help keep it down as the hogs seem to do better when the feed is not too large, to get a good pasture for hogs we must have new seeding and clear clover. I have never been able to make hogs gain much on any pasture but clover. I have thus far spoken only of pasturing hogs on clover; but understand from others that have tried it that they can be well wintered on early cut clover alone. But I am inclined to doubt the wisdom of confining them to an exclusive clover diet any more in winter than in summer. When I have had nice early cut clover I have been in the habit of making it a part of the feed of my store hogs, and when I have hogs shut up for fattening I have been in the habit of carrying them a fork full of clover every day and it would be eaten with apparent relish and in my judgment is very beneficial, if in no other way it gives them a change of food which always aids digestion. I have already gone beyond my limits and so must stop. I would have been glad to tell you how to sow clover seed so as to ensure a good catch, and then about fertilizing so as to get large crops, but will leave this part for other speakers.

Hiram Smith — We will now listen to a paper on dairying, The State of the Art, and I am very glad to state that on that subject we have the highest authority in this or any other country. Prof. L. B. Arnold, of New York, now like myself, advanced in years, but who has devoted long years to the acquirement of accurate knowledge. Knowledge that he freely dispenses to those that desire to hear it. He has, like all other men of energy, met with opprobrium and misrepresentation, but having the courage of his convictions, he now stands without a rival.

Prof. Arnold — *Mr. President and Gentlemen of the Convention:* In correspondence with your secretary, in regard to my coming here, I was informed substantially that the chief object of my visit would be to draw out such information as could be obtained without any previous preparation on my part, by questions and conversation, and in accordance with that understanding I have prepared a paper comparing somewhat the present with the past, or so much of the past as I have observed, in order to show what rate of progress we have been making, not knowing what the secretary had in view, I did not attempt any specific line of discussion.

DAIRYING — THE STATE OF THE ART.

By PROFESSOR L. B. ARNOLD, Rochester, New York.

We can best appreciate the position the dairy interest now occupies by comparing the present with the past, but it must be apparent at the outset that the art which is as old as civilization, if not older, has made but slow progress through the long ages of its existence to be in the depths of darkness it is acknowledged by all to be now groping.

It is now just about forty years I began studying the facts and philosophy of dairying. Without going any further back, a comparison of what was known then with what is known now, may be interesting and perhaps useful, as showing the progress made and the tendency of events in relation to our calling.

Cows gave milk the same then as now, and yet we know but little more about the process of secretion than was known at that date, which was next to nothing. There is in this direction a wide and shady field open for us to explore, which, whenever clearly traced out, will be of immense importance to the practical man, for when we come to know all the changes which transpire in the conversion of food into milk, we shall know better how to produce it, and perhaps, be able to do so without using the body of a cow for that purpose. It would not seem a more difficult task to make milk without a cow than to make butter without a cow. The variations produced in milk by variations in food, by distance from time of coming in, by treatment, by sanitary conditions, by temperature and mental influences, and the influence by breed and individual constitutions, etc., were as well known forty years ago as now, and were as fully discussed by authors, but were not as well known to the average dairyman as at this date. Although we have gained but very little in these matters beyond what the preceding generation knew, we are making a broader use of what was developed before our days.

The fat globules in milk were long ago discovered and known to be the basis of butter, and and very little positive knowledge concerning them has been developed since, until quite recently. Dr. S. M. Babcock, of the New York Agricultural Experiment Station, has lately demonstrated what many others had guessed, that they are globes of fat in a liquid state surrounded by nothing but the visceous matter they are suspended in, and form a true emulsion. This demonstration is a matter of considerable importance, as it gives us positive knowledge for a starting point in the investigation of the secretion of the milk; for the separation of cream and the management of cream and butter; and enables us to understand how butter comes — a point which was not clear before.

In some other directions butter-making has gained some important acquisitions. A point has been gained in the granulation of butter in the churn, allowing it to be cleansed

of buttermilk without working, a circumstance which has largely increased the production of fine butter. Another has been gained in the discovery of the influence of a falling temperature in hastening the rise of cream, and another in the efficiency of intense refrigeration in accomplishing the same end, and the intensifying of the flavor of butter by atmospheric action on fresh cream; all important items of knowledge which have been developed since my labors in the field of dairy husbandry began.

The latest and perhaps the most important acquisition to the butter-making interest is the centrifuge, which threatens to revolutionize the whole business of butter-making by the short cut of an instantaneous and complete separation of cream while the milk is new and sweet. As good butter was made forty years ago as now, but at the present date it is made with less labor, and it is more completely exhausted from the milk, and by these means reducing the cost, but the greatest good to the butter interest and to the country from increased knowledge and improved appliances, lies in a much larger percentage of fine butter and a general elevation of average quality.

What was true forty years ago in regard to butter was equally true in regard to cheese. There was some cheese made then as fine as any made now, but the quantity was smaller in proportion to the total make. The history of the cheese industry in this country differs somewhat from that on the other side of the Atlantic. In continental Europe there seems to have been little change for many years. In Switzerland, for example, the Gruyere, or Switzer Kase, which has probably been more widely distributed among European nations than any cheese and given the best satisfaction to the public taste, was made in as great perfection three hundred years ago as to-day. Its leading characteristics seem not to have been changed at all. The same is nearly true with the celebrated French cheese, Roquefort, which is older still, having been mentioned in history 1,800 years ago, and several varieties of Holland or Dutch cheese as the Edam and Gouda, have run a similar course for several hundred years, while in England the best authorities

agree the cheese, of which there are several noted varieties, do not average as well as they did fifty years ago. In this country the cheese industry is progressive. If we do not make any finer cheese than formerly, we make a much better average. We make it more uniform and at a better profit. When I first became interested in cheese making, cheese was the most uncertain product of the farm because no one had any knowledge of the "whys and wherefores" of his work. Nobody could tell why he used rennet in preference to any other coagulating agent, or whether it served any other purpose than curdling the milk. No explanation could be given for the changes that were taking place in curdling the milk or in the conversion of curd into cheese or whence or how the new flavor peculiar to cheese was produced.

When I began a studious investigation of the part played by rennet in cheese-making, which was over a quarter of a century ago, though nobody knew anything about it, everybody supposed, and took it for granted, because acids would curdle milk, that all the efficacy of the rennet was due to a small quantity of acid it was supposed to possess and usually did possess. My first step in the investigation was to test the truth of this general belief. This I did by putting potash into my rennet jar and into the milk, making both alkaline, with no other variation following than to delay the curdling of the milk three minutes. The quantity of rennet which before had brought curd in fifteen minutes, when made alkaline brought curd in eighteen minutes. Of course this upset the whole acid theory of the action of the rennet, but dairymen hung on to it for a long time, all the same, and there are some who hold on to it still, so hard is it to overcome early impressions. Acid will curdle milk and harden curd, but it never was even an element in converting milk and curd into cheese. I say this understandingly, and in the face of the fact that three-quarters of the cheese-makers of the country regard this as a *sine qua non*.

A rigid demonstration of the fact that rennet not only curdles the milk in cheese-making, but also converts the curd into cheese by virtue of its digestive action, is one of the new and valuable points gained to modern cheese-making.

Great advantage is also gained from the fact that the characteristic flavor of cheese is only produced by atmospheric action upon the substance of the curd, under the modifying influence of rennet. In other words the development of cheese flavor is an oxydizing process, but the breaking down and mellowing of the curd goes on wholly independent of free oxygen, and is controlled entirely by rennet, moisture, and temperature, the condition of the milk being the same.

Another item of considerable value in elevating the cheese-makers art, consists in a successful separation of the coagulating and digestive agency in rennets, and presenting it for use in a concentrated form, of even strength, and durable. The extent to which rennet extract has come into use, and the excellent effect it has produced, entitle it to a place among the modern valuable acquisitions to the art of cheese-making.

It would doubtless be interesting and perhaps useful to the cheese-producing part of the convention, to trace out more in detail the changes which have, in a few years, been discovered to be taking place in the processes of manufacturing and curing, and the causes which influence them, but the length of my paper forbids. I must close this part of my subject by referring to the great variety and excellence of machinery and implements which have been invented to relieve the labor of cheese-makers and to improve the stand- of their products, of which all now in use have been brought out since my memory. We have, I am confident, a better and greater variety of cheese-making implements than any other people in the world, and an essential element in our success they are.

But our progress in cheese manufacture has not proved one of unalloyed success. Some erroneous practices have done not a little to depress the state of the art. For example, the good effects of our superior machinery for cheese-making are nearly counterbalanced by the defective building in which to make and cure cheese. The best modern methods of making good staple cheese require the curd to be aired and kept warm for three hours or more after it is out of the whey, before salting and pressing, the desired

temperature being from 90 degrees to 95 degrees. I think it would be safe to say that not one in ten of the make-rooms, especially in the west, would permit of holding curd at such a temperature for a single hour's time upon any cool day. When unable to carry out the best process an inferior one must be resorted to, and the product sinks accordingly. Curing rooms are defective in the same way. No fact in the cheese-maker's art is better established than that cheese is best cured in an even temperature, and is always injured when it varies, and the wider the variations the greater the injury. Place in a curing-room, the temperature of which runs up and down with every variation in the outside air, cheese defective in make, and you have a combination of misfortunes, which tells on the reputation of the country's cheese, and one which I hold, cheese producers can not afford to indulge in.

Another deadly blow at the state of the art consists in the faulty preparation of rennet. Those only who travel much among cheese factories can appreciate the extent of this evil. In illustration, I will give you an actual fact in my experience as a dairy instructor. I had occasion, not many summers ago, to visit and give advice in eighty factories in one locality, and, as usual, wrote out in my diary a full statement of what I found in each factory and what was done in it. When through with the work, I found, by reference to my diary, that in sixty out of the eighty factories, rennet, in an actual and offensive state of putrefaction, was in daily use, and had been all the season. The remaining twenty were using either good rennet or rennet extract. I have traveled, as you are probably aware, pretty extensively among cheese factories both in this country and in Canada, and I can assure you this is no exceptional case. It is indicative of what is, and has for years been occuring in cheese factories generally. Prof. J. B. Harris, who has probably visited as many factories as I have, assures me that he has found the same state of things wherever he has been, and Col. Curtis informs me that good rennet was rather the exception than the rule in Wisconsin. This is a sad state of things, and one there is no necessity for. It is

not pleasant to speak of or to think of, but in giving you the state of the art I should not be doing my duty to pass it in silence. Nearly the whole of this misfortune comes from the bad practice of soaking rennets in whey instead of a saturated brine.

We count a good deal on the advantages of our co-operative system of making butter and cheese, and, I think, in many respects, very justly, especially by way of uniformity of products and reducing cost of manufacture, but when I reflect how much mischief has been done by the use of sour and stale whey in soaking rennets and in soaking curds, it almost forces a query whether we have not overrated the cheese wing of co-operation. But our course, as a whole, is onward and upward. If our ancestors made some butter and cheese as good as we make, we produce a much better average than they, which is important. We have done, and are still doing a good work in educating and leveling up the average dairyman and improving his products — a most profitable and philanthropic line of labor, and one to be always kept prominently in view.

DISCUSSION.

Question — How would the Professor prepare rennet to get the best results from it?

Answer — The best and safest way, all things considered, is to boil the water, and long enough to kill every kind of vermin or animalculate that may exist in it, and when it is cool, saturate it with the best salt you can get, and soak your rennets in that, stirring them often. Use all the salt the water will dissolve, and a little more. You can get it out a little faster by soaking in a week brine, but I don't think it is best to recommend that, because so many spoil the rennet while the brine is weak. If I was going to use the rennet immediately, I would use one pound of salt to twenty pounds of water, and soak in that, for use right away. But cheese-makers, as a rule, to keep it, had better soak in a saturated brine, and always in water that has been boiled.

Question — How many minutes would you hold your milk and how little rennet would you use on a thousand pounds of milk, for a cheese that is going to come to its finest quality, say in six months?

Answer — I would use the strength of rennet that would begin to show coagulation at ninety degrees in twenty minutes. For ordinary market, I would have it show curding at twenty minutes. That would take less rennet. Having it at ninety saves a great deal of labor, it takes longer to work it but you hold it longer.

Question — Do you get as much weight if you leave it forty minutes before it coagulates?

Answer — You can if you are skillful in working it. I think the flavor does not develope quite as much under the slow working, as under the quicker working.

Question — Is cheese ever cured in a short time, say twenty days?

Answer — Yes, a cheese can be cured in forty-eight hours, fit for the table.

Question — It is pretty near half rennet, isn't it?

Answer — No, sir. It wouldn't vary the quantity of rennet to cure it in forty-eight hours. I would keep it warm. I would not apply any extra heat but keep up the heat longer. You take a curd made in the ordinary way that is expected to be fit for the table in thirty days, if it is kept in a curing room at sixty-five or seventy degrees, and keep it warm for forty-eight hours at ninety to ninety-five degrees and then press it, as soon as it is out of the press it is fit for use. The fact is, a cheese will cure as much at ninety-five degrees before pressing while it is in the open air, in an hour, as it will cure in the curing room in a week at sixty-five to seventy degrees.

Mr. Hoard — The finest cheese I have ever eaten in America was cured in a sub-earth curing room. A seven months' curing.

Answer — Yes, there is great advantage in curing cheese that way for the reason that the flavor remains longer. A cheese is never in the same condition two days in succession. The flavor of cheese is made by the oxydation of the

fat and casein of the cheese, under the influence of rennet, while this oxygen is acting upon it, the flavor is developed, and it is an entirely new flavor, just as new and foreign as the existence of whisky is in rye. It is not in the grain, it is a thing you develope, *de novo*, and if it is moving very slowly, it will be longer in developing, and the fine rosy flavor will stay longer. It does not stay long anyhow, because it is constantly changing, like a fruit in ripening. It is all the time going on towards digestion or decomposition.

Mr. Hoard — Another thing I noticed about this cheese I spoke of, which was so long in curing, was the remarkably low condition of shrinkage, only a pound and a half in a fifty pound cheese in seven months, the gasses passed off so slowly that there was no rupture of the texture of the cheese, consequently it was close and meaty, the temperature was about sixty-five to seventy-five the first three months, and was then lowered slowly. This cheese sold in the spring of 1879 for a shilling a pound in our town and went off rapidly, when other cheese was selling at five and six cents. I never saw as fine cheese made in the United States, as those that were put in that sub-earth room in October, and held steadily for seven months.

Prof. Arnold — They suffered no damage from the rise and fall of temperature. There is where there is a tremendous loss all over the country, in having cheese in curing rooms that do not keep the cheese at an even temperature. One that has never observed it, cannot imagine how much he loses by that condition, and the greater is the pity because it costs but very little to make a curing room, where it may be kept at a uniform temperature. In fact, it is about the cheapest way you can build it. It is only for want of the information and skill in the construction of buildings that these rooms are constructed as they are.

Question — Do you always add the rennet at all seasons of the year at ninety degrees?

Answer — I have made it a rule ever since I have been giving instructions in cheese making to set it at as high a temperature as I could and not cause any riling of the whey, not to have the whey come off cloudy. If you set it

as high as 98, there is a waste that goes off in the whey, the whey carries so much fat and cheesy matter that you don't get a good yield.

Question — Would you set the milk at 90, if it was sour and old?

Answer — I have set it at 90 to good advantage.

Question — How high would you scald in that case?

Answer — I wouldn't scald at all. I would raise the temperature according to the degree of activity from 80 to 90 and hurry the work along, because in the souring you will have too much moisture and would use a little more rennet for the sake of getting a little rennet action in the cheese.

Question — At what temperature would you cook the curd?

Answer — Never above 100.

Question — Would you stir the curd after you got it heated up, before you took the whey off?

Answer — Always keep it so it wont mat in the vat, that is, while it is in the whey; I leave the whey on just as long as I can and not have any sensible acidity develope in the whey, be sure to get it off sweet. When I am manufacturing strong smelling cheese, I draw it just as soon as it is hard enough, so it will admit of being stirred or kept in the vat.

Question — By what process do you prevent the curd from matting after the whey is off?

Answer — Stir it, but not too long, keep it stirred for ten or fifteen minutes, and then the whey is well out of it and it is better to let it mat, stick together and cut it, turn it occasionally, and then grind it. Cheese-makers as a rule will make better cheese that way. Of course that necessitates a curd mill.

Question — How much will an ordinary average rennet coagutate? How much cheese will it make in fifteen minutes?

Answer — It ought to coagutate 400 pounds of cheese, of course it would be half an hour longer before it is fit to cut, so the time from adding the rennet to cutting the curd would be about three-fourths of an hour.

Question — Tell us how to build a curing room?

Answer — I will give you a description of a little dairy room which I had the honor to direct the building of, at Cornell University, last summer. The floor is cement, not a particle of wood about it, the ground was graded to a right grade and cobblestones pounded down until there was a firm foundation beyond all question of any settling by any weight that might be on it. Coarse sand was put on then, and pounded down, and on this foundation a coat of cement was placed, strong enough to bear any pressure that would be put upon it. The sills were laid on a foundation of a grout wall, some eighteen inches thick, that began below the plaster, and came up a little above the surface, but not quite so high as the cement or the floor; that is to say, the cement came up a little above the lower edge of the sill. That was to prevent all currents of air from coming up under. The sills should be laid flat ways so that a sill 10 inches wide may not be more than four inches thick, and the studs on that should set out within an inch of the edge of the sill on either side. In the middle of these studs, say the sills are 10 inches wide, in the middle of these studs was nailed a course of building paper from one side to the other with cletes drawing it up snug so as to make it a perfect diaphram between all these studs, all around the building up to these plates, the plates being the same as with the sills. On the interior and exterior side of these studs was also nailed building paper, making three coats of paper, all very cheap and all put on by ordinary labor. It don't even require a carpenter to do that; on this paper was nailed furring that would come out even with the edges of the sills on both sides, inside and outside, on the inside was nailed narrow siding, all sound pine, and narrow siding so there should be no shrinkage or cracks. This left a space of an inch between the papers and the sill or side; on the outside siding of the same kind was put perpendicularly, and there was also an inch, so there were four dead air spaces in the siding. The joists for the floor were covered with ceiling paper on both sides, under and over and the floor is siding of the same kind as that put upon the side of the building, covering the

joists above and below, making a floor and ceiling overhead that made a perfect safeguard against cold. The roof, or the second story rafters were covered with building paper in the same way, furring put on that, and then that ceiled over, leaving a dead air space between the paper and the roof. The rafters are set a little above the space so that there would be a current of air passing over the plate in between the rafters and the paper, and any warm air that comes in under the roof will be carried out of the ventilator. The space under this was covered with wire cloth to keep any mice or large bugs from getting in. The doors are made the same as the side, and wherever there were any partitions, they were made in the same way and the windows double glazed, and with such a structure, neither the heat nor cold will make any difference. The cost is but a mere trifle and the work can be done by ordinary hands.

Question — At what temperature will this room stand in the summer when it is ninety degrees outside?

Answer — It would be just the temperature of the earth below. The best way to heat in winter such a room or any room is with steam.

Question — If that was used for a milk room with shallow settings how would you ventilate it?

Answer — The ventilation in this room was in the upper portion of it. We sent a shaft down and put a galvanized iron vessel in for refrigerating and ventilating, both, and we could lower the temperature that way, the ice tank was about two feet square, and three and a half feet deep, this was a very small room used only for experiments before the class.

Question — If a curing room is not ventilated very much won't it mould badly?

Answer — No, not necessarily. I like to have cheese mould a little; I would rather fight the mould than have the cheese too dry.

Question — What effect has the light on the quality of the cheese?

Answer — I don't know that it has any.

Question — If you were building a creamery now, would you want it moist?

Answer — I would want the air as near natural as I could get it; I would not want it moist or dry.

Question — If you were keeping milk for skim cheese would you keep it at a high temperature?

Answer — I would not keep it for skim cheese anyhow; if you do keep it, it requires a little higher temperature.

Question — Does a rich full cream cheese require as much temperature as a cheese that is skim, or cheese that is made in the early part of the season, that is not rich?

Answer — It does not; the more fat there is in it, the lower the temperature required to cure successfully.

Question — Can cheese be cured successfully in boxes?

Answer — Yes, it can easily. Cheese can be put in an ordinary cheese box when it is four or five days old, or even right out of the press, box it up, put it on the floor, anywhere where it can keep an even temperature and dry, and let it remain there, turning it occasionally, perhaps once in a fortnight, to prevent the brine from settling on one side of the cheese and it will cure very well; I have made the experiment myself.

Question — Is there any trade that will buy such cheese?

Answer — Yes, D. McPherson, the cheese king of Canada, the owner of sixty-six factories in one combination, made a test of this kind, and put the cheese on the market. And sold them on the top of the market. I will give you an experiment I made once, I ordered a vat of milk made up at the factory, there were six cheese came out of the vat, and I made arrangements to have two of those put into boxes as soon as they came out of the press and put into a neighbor's cellar, the cellar being about sixty degrees; two others were put into boxes at the same time and put on the floor of the curing room and the other two were put on the shelf in the factory and treated as usual, I let them remain there three months, and then they were shipped to me, and I found the cheese in the boxes shrunk twenty per cent. less than those on the shelf, and those on the shelf had developed less flavor. The cheese under the table in boxes were the next in quality

poorer, those in the cellar were the best, there was little difference in the shrinkage of those under the table and those in the cellar, but those in the cellar were the finer.

Question — Mr. Smith and others think it would not do to box the cheese so soon as the cheese would be more mouldy, and not have the bright appearance that is desired.

Answer — Your cheese will mould in the box any way, the cheese that are shipped are invariably molded, when they get on the other side, they have to be burnished up when they get there. Mr. Ballentyne, who is an authority on that subject says, "we don't care whether they are mouldy or not, we have got to burnish them up anyway," there is less waste on rind where you cure in boxes, than out, the flavor does not develope as fast. As the flavor depends on the presence of air, but I think it gets a finer cheesy flavor at last.

Song — "Are you Sleeping Maggie," by Mr. Jules Lumbard.

WHAT IS A COW FOR?

By W. D. HOARD, President of the N. W. Dairymen's Association and Editor of Hoard's Dairyman, Fort Atkinson.

Mr. President — I am instructed to speak on the question, "What is a Cow For?" but I wish first to promise what I am going to say by the enunciation of these questions, at the start, are we dairymen or are we not? Are the men who are here to-day, who are interested in the discussion of dairy questions, are they prepared to accept the finality of this question? Are they prepared to accept the standard of judgment that belongs to a dairy cow? or are they half and half dairymen, standing with one short leg and one long leg? Are they men that are prepared to accept the judgment of hundreds of years as to the machine they are doing business with? It would seem that in a Wisconsin convention, where this subject has been discussed for twelve years, that it ought almost to be a superfluous one, but my friends, it is not. The average farmer of Wisconsin to-day is not prepared to accept the finality of the statement that there

is a dairy cow *per se*. Ninety-nine men out of a hundred will say, "I don't want such a cow; I don't want a dairy cow; I want a sort of preposterous make-up of a little cheese and a little butter, and a little beef; something that they call a general purpose cow." It is a humbug from the bottom to the top and I say that, having in view the cow that you average, Wisconsin farmers have been building from a general purpose stand-point, a creature that you are ashamed of, when the figures are brought up and launched right square in your face. Your general purpose idea of a cow has produced a poor animal, and it has also produced poor dairymen, and the combination of the two have worked to reduce the average profit all over Wisconsin. Now you see where I stand; and if I have anything to say or plead, it will be for a specific dairy cow. Not any particular breed, but that breed, that line of descent, and that combination of blood that has made her just as emphatically a dairy cow as a race horse is a race horse; or a draft horse is a draft horse; and if I could get the farmers of Wisconsin to accept this finality, if they could not reach it in ten years, simply accept the idea, and steadily push forward to the realization of that one single thing in their minds, it would do more to put thousands, yea, millions of dollars into the pockets of our dairymen than any other thing.

According to the most intelligent and liberal estimate that I can make, and I have been engaged at it for a number of years, the average number of cows in Wisconsin, producing cheese, this year, is sixty-six thousand, out of nearly six-hundred thousand, the average yearly milk production of these cheese producing cows does not exceed three thousand pounds per cow. Now, why are men fooling away their time with such a low average of results? When a man enters into partnership with a cow, he goes in with the prospect before him of what we call certain dairy expenses. You are put to the expense of milking that cow; tending her; feeding her; housing her; fencing for her; providing land for her, and if you are going to get your money back, you need to be sure that she is the best machine possible, because in no other way can you get a reward for this expense. To

fool away your time with a three thousand pound cow, when you might just as well as not work your forces towards a six thousand pound cow, is preposterous and a very costly business judgment.

Now here are three cows, for instance, each making one hundred pounds of butter, while on the other side is one making three hundred pounds of butter, does it not cost three times as much to keep those three machines in existence as this one? Isn't it three times as much expense? That low estimate shown by keeping the three cows in place of the one enters into the judgment nine times out of ten, of men who are patrons of cheese factories and creameries. The idea is that they must have a cow, that when they are through with her, will produce a little more beef. The result is, that it is impossible to reach a high average result, because nature has set her flat, and my friends you can't beat nature. Nature runs in straight lines in heredity. With all kinds of animals, if you reach the largest results in any one line, that line must have the majority of the heredity, and it must be so strong that you can count on its reproduction in succeeding generations.

Take for instance, a cow that a man has been milking for eight years, and making one hundred and twenty-five, or one hundred and fifty pounds of butter a year, and which will, at the end of her life, make five hundred more pounds of beef than another that will make two hundred to two hundred and fifty or three hundred and fifty pounds of butter, which is distinctly a dairy cow, with a dairy form, a dairy organization? The last cow will give you, during the eight years enough more butter to buy and sell the beef cow and her product three times over, and yet men fight this idea constantly. I believe their ideas are disastrous to the best dairy interests of the state.

This gives us a chance to speak of what a dairy cow is. A dairy cow in the first place must have a dairy heredity; she must be born from dairy lines, dairy stock, and with dairy lines of breeding. A great mistake that many farmers make is in supposing that a cow that is a good cow, a good milker, invariably breeds a good cow. They forget

that a cow breeds from her blood, and not from her udder; she breeds from what is behind her, more than from what she is herself. To illustrate, in my own county, a gentleman owned a Short-Horn grade cow that was ane of the finest I have ever seen in Wisconsin. She would give sixty-four pounds of milk a day, and made nineteen pounds of butter in one week; she was a wonderful cow. This gentleman said to me, "I have the foundation here of a fine herd of cows, and I propose to improve it." He bred that cow to the best of his ability in the same line of blood, and he never received a decent heifer from her — and she gave him nine — none were worth anything as cows. Why? Because that cow came from a line of beef heredity, that manifested itself in her offspring. She was a digression from the line, but when she came to breed she established that line of descent adhering to the laws of descent. Whatever breed your cow belongs to she must have a dairy descent. Then, again, she must have a dairy form. One of the best writers on this question, says that the Short-Horn men have destroyed, a once grand dairy breed, by breeding for thick thighs and heavy loins, undertaking to carry double, to put more meat into the form, supposing that nature would not wreak her full revenge.

Nature does not work in that way at all; again, a dairy cow must have corresponding dairy care. Let me call your attention to this, gentlemen, a cow, when giving milk, is in a relaxed condition of body. The giving of milk is the mother function of all animals. The cow gives milk because she is a mother, and the secretion of milk, necessarily produces a relaxation of the whole system. It must necessarily follow that she is exceedingly sensitive to extremes of temperature, and particularly towards a falling temperature, she is particularly sensitive to cold housing, cold feed, cold water, anything that reduces her natural temperature, and she takes revenge out of your pocket. She says to you, if you haven't a head good enough to understand your business, sir, I am not here to furnish you with brains; I cannot furnish you with milk and brains both, and consequently I

will take away the milk. I will do what nature compels me to do; protect myself.

Then again, a cow that is giving milk must have a large amount of water, she must have milk producing feed, and on that point there seems to be a great lack of understandgin. I remember last winter, at a convention, when Mr. Boyd said that he was warming the water for his cows, and they gave him twenty-five per cent. more milk as a result, that all over that audience was seen a sneer, and one man expressed it by saying, "we don't propose to baby our cows." These men did not take cognizance of the mother principle in the cow. They were prejudiced, as so many everywhere. They look at the truth through prejudiced glasses and they must in some way be lifted out of that prejudice. Speaking of prejudice reminds me of a story. I was standing in a hotel in Independence, Iowa. It was pretty cold. The stove was red hot, and a man came in who had one short leg. He walked up to the stove and bent over, out of shape, and tried to take a little heat. A man stood by a little drunk, just enough so he couldn't understand why any intelligent man should try to warm himself in that unnatural shape. Finally he spoke up, and says, "My friend, are you a well man?" "Oh, yes?" He looked him over, up and down, and finally said, "Well, all I have got to say is, if you are a sound, well man, you had better get away from that stove, for you are warping like the devil."

Now I have not said one-tenth part of what I would like to say, but I will ask you, my friends, to first face this question, what does it mean to be a dairyman, with dairy ideas of a dairy cow, and her care and feed? When you do this, it will help greatly to solve the question of, what is a cow for?

SIX YEARS AS A CHEESE INSTRUCTOR.

BY J. B. HARRIS, Antwerp, New York.

In several epistles addressed to you as brethren of the Dairymen's Association, I have expaciated more or less at length upon the whole doctrine of the transformation of

milk of kine into that wholesome and exceedingly nutritious article of food designated by the enthorious name *cheese*. After a careful consideration of the condition of the cheese industry of this Province, now flourishing in the light of the new Gospel which many apostils and teachers have shed abroad among you, and which you yourselves by your intelligence and genius have increased to a luminary of the first magnitude, so that now, like the sun, you furnish light for the whole cheese manufacturing world, I have conceived it my duty as a teacher, whose delight it was in former days to preach the doctrine of the true cheese system; to hold forth to you briefly, on the life and experience of those who wander about from parish to parish, and from factory to factory, performing many good works and declaring many a sound truth among you.

Doubtless the Christian church owes its success and the vigor with which its truths have been pushed into the uttermost corner of the earth, as much to the faith, enthusiasm and self denial of its teachers as to any other element in its economy; and I conclude as I believe logically, that your system of instruction is as vital to the growth and progress of the cheese industry as the priesthood has proved to the church. Not to see that a corp of well drilled, faithful, painstaking and enthusiastic instructors, going about from factory to factory, carrying with them a full stock of faith and energy, and depositing new zeal into the hearts, and reviving the flagging energys of the makers in each district, is highly beneficial to all parties concerned, is to be blind indeed. You the people of the province of Ontario, wiser in your day and generation than your brethren across the border or beyond the sea, early saw the force of this truth; you were the first to demonstrate its practicability and power to the eyes of the world, and were first to harvest its fruits. First to profit by, if not to perceive the advantages to be derived from your idea, the dairymen of Scotland inaugurated the practice and now their industry is swiftly climbing to a higher plane and striding vigorously forward on the march to improvement under the power of the new life already infused into it by the new system. Nay, not satisfied with

merely the employment of itinerant instructors, the project of establishing dairy schools wherein those proposing to become makers will be given a full course of instruction, scientific and practical, and furnished at the close, if entitled thereto, with a diploma, is being thoroughly discussed, and I doubt not will ere long be adopted. Because it has been my good fortune, gentlemen, to be an active member in the advanced guard in this movement in the two countries above referred to, there may be some who will impute to me the fault of egotism. To such let me say that truth is truth, even if spoken by an egotist, and upon this subject of organized cheese instruction there is a *hand writing* upon the wall in a language that all may read, and that those who will not profit by its teachings must fall in the rear and take the dust of their more progressive brethren.

The most obvious truth, and one of the fundamental principles of what may be called the science of human industry, is the distribution of occupations. As time goes on and the wants of the human family increase, and as the sons of men multiply on the face of the earth, professions, trades, and occupations increase in number, narrow in scope and require more skill on the part of those who fill them.

In the year 1879, the first itinerant cheese instructor made his appearance on earth in the person of Prof. L. B. Arnold, some where in the province of Western Ontario. In the year following, your humble servant began his ministration in Eastern Ontario, since which time he has continued his labors in this and other fields, with what results, let a discriminating public pronounce. Since we began our labors we have had the satisfaction of seeing others enter the field and we hope as time goes on, to see the family increase in numbers and usefulness throughout the entire dairy world.

CHARACTER OF THE INSTRUCTOR.

The business of instructing cheese-makers is as much a profession as any other, and requires peculiar qualifications and an experience peculiar to itself, like any other. It is not every cheese-maker, I care not how good a workman he may be, who can perform the duties of an instructor success-

fully, for it is one thing to know how to make good cheese, but it is quite another to know how to impart this knowledge to others. There are thousands of excellent mathematicians in the world, who could do nothing as instructors in that science. The work of imparting information to others, requires a natural aptitude and much practice, and especially is this true in the work of educating cheese-makers, not more on account of any special want of perception and astuteness on the part of the pupil, than because of the peculiarities of temperament, disposition and mental structure every where to be met with among them.

In the first place I remark that the instructor should be a thorough master of the science he proposes to teach, understanding not merely the obvious causes and ocular results in the process, but having also a broad, comprehensive knowledge of all the thousand and one secrets and unapparent influences that hover about, molesting either for good or evil the progress of the work. It is this comprehensive knowledge, together with a well grounded faith in all the leading principles of his art that enables the instructor to speak intelligently and convincingly to those whom he seeks to instruct. Again, this knowledge should not be of that peculiar vascilating kind which characterizes the investigator who is constantly propounding conundrums which he has not as yet solved himself, but should be of that clear, positive kind which speaks only of known truths, and that with positiveness and enthusiasm.

In the second place, the instructor needs to be a good student of human nature; he should know how to measure men, how to discover almost at a glance at least the leading peculiarities of the mind upon which he is to operate, and should know how to vary his language, methods and deportment to meet them. Without this knowledge he will be as likely to block the wheels of progress for the day in ten minutes after entering the factory in the morning as otherwise.

In going over a large tract of dairy country, we find among makers great diversity of thought, feeling, and

aspirations and unless we can learn to play upon these harmoniously we may as well go out of the business at once.

Third; the instructor should be a good natured man. A morose, surly, quick tempered individual would not remain long in the business, for we fancy that soon after entering upon the discharge of his duties there would be seen in the columns of the daily, a paragraph headed *missing*, and by and by his mangled remains would be found in the whey vat at the factory, where he met with his first outburst of ill temper. The whole truth is expressed in the familiar, though somewhat inelegant proverb, that more flies can be caught with molasses than with vinegar. A smiling face is indispensable to an itinerant instructor, as is a good suit of clothes to a book agent, the face gaining for the instructor a welcome to the factory precisely as the clothes secures an admission for the agent at the door of the brown stone front.

An instructor should be a patient man. This is highly important. Indeed, we have sometimes thought his compensation ought to be measured by the degree of patience and persistence he is capable of exercising. From the beginning to the end of his duties these qualities are constantly being brought into requisition. Prior to, and during the first year of my mission in eastern Ontario, a practice prevailed among makers of so hastening their work, that by 1 o'clock P. M. they were at liberty to take part in a hunt, game at ball, or to drive to the nearest town for the balance of the day.

This was a state of things impossible to good results, but was altogether too comfortable to be easily broken up and the imagination of a new practice which detained the operations until a much later hour, was the occasion for the use on the part of some of them of unlimited profanity and the exercise on my part of no little patience and forbearance, but thanks to the good judgment and better nature of these men, the practice has now, we believe, pretty generally gone out of use. In Scotland where we taught by classes, and where we often met as many as fifty and sixty, and sometimes ninety persons at a time, and made cheese in their

presence, we think we have often answered the same question as many times as there were persons present. To do this and to accompany the answer with proper explanations and with more or less of exhortation and encouragement, required, I found, the out lay of more patience than I sometimes had at command.

It would require a volume in which to describe all the occasions that present themselves in the course of a season's work, for a loss of temper, or the sacrifice of one's patience in the extremely vexatious work of learning *old dogs* new tricks; to break down old prejudices; to convince men against their will; to indoctrinate minds with principles, which on account of their subtility and obstruseness they are incapable of appreciating; to induce a discipline of the required thoroughness into makers, naturally slovenly and heedless, were things which we found required the exercise of indominable perseverance and inexhaustible good nature.

INSTRUCTORS MANNER OF LIFE.

The life of the instructor is a strangely diversified and checquered one. The cup which Providence prepares for him, like that which she prepares for all her children, is mingled, and we have sometimes thought the preparation of bitterness which she puts in his draught too largely in excess of the sweet. We were never much impressed with the advantages extolled so highly by our parents and early instructors of early rising. In fact from childhood we have found ourselves constitutionally opposed to it, nor has our hostility in the least abated, since during the last six years we have been compelled continually to tumble out of bed while the stars were abroad in the sky, and without our breakfast, bowl away many long miles through the cutting morning air, before beginning our day's occupation. Let him who is ambitious of becoming an instructor consult first of all his stomach. If he finds that organ possessed with unlimited capability to endure privation and grief it is well to let him go on and achieve the glory he dreams of, but if he finds it sensitive and withall a little weak, let him remain at home or the places that knew him,

soon after he begins his work will know him no more. Meals at all hours, at unusual and unseasonable and uncomfortable hours, and sometimes no meals at all; an abundance when we were satiate and when we were famishing, nothing. Sour bread, stale butter, weak coffee, poor tea, salt pork fried in grease, meats cooked too much, and meats cooked too little, meats too hot or too cold, such is a mere abridgement of the unwholesome bill of fare to which the devoted instructor is sometimes expected to do justice. In the main, however, let me say that I have found the housewives, both here and in Scotland, excellent cooks and the tables at which I have taken my meals *well* supplied with an *abundance* of wholesome and nutritious food and the linen and table furniture well kept and cleanly. We have spoken of our hostility to early rising, but there were times in our experience when daylight came not a moment too soon. This is all we have to say on the subject of sleeping accommodation. But then came the days when the sun rose beautiful above the eastern hills when on arising from a comfortable bed and partaking of a delicious breakfast, we took our place in a fine carriage behind a span of fleet horses and while the birds were carroling from the wayside trees, sped away a few miles to the factory to begin our day's occupation; when the building wherein we worked was well made and ship shape; when the maker met us with a smiling face and a cordial shake of the hand; when the milk came in excellent order; when the atmosphere was favorable; when the tools and appliances were in good order and convenient; when the rennet was satisfactory and when all the circumstances seemed to conspire together for good and it was upon these days all too few in the life of the instructor that we thought our occupation a holiday and felt our courage renewed.

In concluding this part of our subject we are only too willing to say that in the main wherever we have been whether upon this or the other side of the Atlantic, we have found the people with whom we came in contact, kind and courteous, polite and hospitable and that in the course of

our experience we have formed many acquaintances whom we would much regret to loose.

PUPILS WE MEET.

In the course of a six years' experience we have met and given instruction to what we estimate, at ten thousand people, and in this number it would be strange indeed not to come across now and again, a peculiarly constituted person.

HALF BREEDS.

First of all, come the half breeds, a set of fellows who, if I may be allowed the expression, seem to care but little whether school keeps or not, who by hook or by crook have learned something about making cheese. They have acquired a superfine knowledge of the old acid system, and this is good enough for them. It secures them fair wages and this to them is the Alpha and Omega of the business. In the course of one or two days by dint of much effort we succeed in convincing them that there is yet another and better way — but what of that, how are they to be benefited by the change? will it increase their pay? If the market be good the buyer will perchance pay as much for our cheese as yours—and so they listen idly to what we have to say, go through with the day's work mechanically and when we are gone make cheese under half the old and half the new system, producing a sort of hybred product that is neither cheese nor anything else in particular. These are a hopeless lot, into whom, to infuse anything like progressive ambition or professional pride is as impossible as to produce a circulation of blood in a marble statue.

PIRATES.

There is another species of the genus who never fail to excite in us, in spite of our best efforts, a feeling of unqualified disgust. They are a sort of pirate who lie in wait for you, and who as soon as you have let fall some ingot of golden truth, pop out from their place of concealment, and greatly to your astonishment present it to you and to the public as a thing discovered by themselves years before.

They are the fellows who, without ever having had an original idea upon any subject in the world, except upon their own astuteness and superiority, turn about and confront you continually with truths which until you uttered them a moment before, they had never dreamed, and who from that moment go forth peddling their stolen goods and pocketing the feloniously acquired proceeds with an assurance and disregard for truth that is simply amazing. Of course, so far as the purposes of instruction go it matters little from whom the improvement springs so long as the community in general realize the benefit, and in nine cases out of ten the community will not be deceived by the empty boasts of such shallow fellows, but we have seen the time, more than once in the course of our employment, when had we not been defrauded by men who ought to have been above such meanness, we could have realized handsomely in honor, if not in something more substantial. The men in the cheese business who are not ashamed to march under a banner and flag and wear laurels purloined from another are by far too numerous and the public by far too apt to render unto Cæsar the things that are not Cæsar's.

THE ENVIOUS.

Closely akin to these are the envious people who cannot endure to accord to another any honor that they do not themselves enjoy, no matter how justly earned, or how poor a reward soever it may be to him entitled thereto. They are the *assassins* of your professional reputation who only wait until your back be turned to put into execution some diabolical scheme for your professional overthrow; perhaps it is the concealment of some important defect in the working of the apparatus or it may be a pail of sour whey introduced into the milk at a time when you are not looking or something of that character slyly done to spoil your day's results, so that when your cheese are made and laid upon the shelves they will compare unfavorably with his own and stand a season's witness of your incompetency and his superiority.

Again, if they cannot circumvent you by such means

perhaps they will turn to something you have written, capable of being distorted by a violent and unnatural interpretation into an intended fling at the intelligence and reputation of somebody and like *Iago* twist your innocent statements into malicious inuendoes against your best friends seeking thereby to turn them against you.

We have in mind individuals of this sort who actuated by this spirit of envy took up our book entitled "Cheese and Butter Makers' Hand-book" and searched its pages diligently for something to which they could attach a handle and having found a paragraph which they thought would answer their purpose, straightway proceeded to use the same as an irritant to the national pride of the high spirited Scot to my disadvantage. The paragraph referred to alleged nothing more censorious of the Scotch cheese makers than in our publications in the Dominion we have published concerning the makers here, and nothing that was untrue. We simply spoke of the lack of knowledge among Scotch makers of the curative effect of rennet and salt and this our pretended friends tried to induce their countrymen to believe an intended attack upon the fair fame of the Scotch people, but one of them when interrogated in the presence of an assemblage of dairymen as to whether prior to the organization of the Scotch Dairy Association he understood that rennet and salt had anything to do with advancing or retarding the curing of cheese? he answered evasively, and said he always knew how *much* rennet and salt to put in. Some twenty years ago and during the dark ages of the cheese business in Scotland, this man had been a shining light in that industry, but for some reason after a little this light had become hid under a bushel. Our friend had degenerated into a very ordinary horse jockey, at which calling he remained absorbed until our appearance in that country, when straightway he forsook the *stud* to reappear a resurrected cheese-maker. One of the first jobs he did upon coming to life was to write a paper upon cheese-making, in which he gave me credit for having achieved a revelation in the business. The appearance, however, of the

volume mentioned aroused his envy, and he seized upon an unjust and unsuccessful means of injury.

But men like these we are glad to say are not numerous among cheese-makers, the only specimen of the genus found in all Scotland being the one referred to.

THE INCOMPETENT.

The number of persons who are to be included under this head is already by far too great, but if a correct opinion may be formed from present tendencies, that number is not so great as it will be in the near future unless measures are taken to close the doors through which they now obtain so ready an access to the business. There are too many persons in the cheese business in favor of cheap help, an item of five or ten dollars per month in the wages of the maker being in the eyes of many, a mantle broad enough to cover a multitude of sins on the part of the employed. Hence it is that a large number of boys with a season or part of a season's experience are brought to the front and given in charge of duties which even they who have grown gray in the business discharge but too imperfectly.

It is one thing to be able to state from memory the rules and process of cheese-making, but it is quite another to have a thorough knowledge of these rules and this process so assimilated and woven into our understanding that they become a part of ourselves and present themselves instinctively when the time comes to use them. A person of ordinary intelligence may learn in the course of one season all the leading features of cheese-making, so that he may be able to state therein the order giving the circumstances of time, conditions and quantity; but this is not enough because when a person assumes the management of affairs, these things which he holds in memory very much as a school boy retains the declamation which he is to pronounce on the stage, are as yet alien to this understanding, and he is liable to forget them and certainly will now and again assist some one of them so that in the course of a season these omissions will amount to a great deal and more than enough by far to pay the extra wages that would have secured a competent person.

Again, the cheese-maker of a season may be a naturally intelligent, and even what we may call a sharp person, but his shrewdness and intelligence, although standing him in good stead here as elsewhere, cannot be made to supply the place of experience because there comes in first the habit of attention which no mind, however acute, can accept as the result of habit, and this habit which must hold the mind of the cheese-maker in its iron grasp from the beginning to the end of his work cannot be acquired in a single season, if indeed it can be in three or four. Second, there is a countless number of conditions and provisos in the business that no memory, however retentive, can garner up for successful use in the course of one season; and, third, no man is capable of taking the lead in the manufacture of cheese who has not had the opportunity of studying the business from the shelves of the curing room; of comparing the work of one season with that of another with a view to atmospheric conditions and climatic influences and with a view to studying the curative effects of rennet and salt, and certainly one season is not enough in which to do this.

As one class of persons who come in to swell the ranks of the incompetent, we would mention those who take up the business as a sort of makeshift and follow it for a time as a temporary employment; these persons cannot have any incentive to excel, and consequently never ought to be allowed to fill any but subordinate positions. Then there are the inapt, the lazy, the intemperate, and a score of others whose short comings and inaccuracies amount in the aggregate to the sum total of all the ills that curse the cheese market and devour the substance of the dairymen as a cloud of locusts eat up the vegetation of the country over which they pass.

THE SLOVENS.

What would the cheese business be without its slovens? those peculiar creatures to whose existence, dirt is as essential, as the atmosphere; who get up and lie down, who eat, drink and sleep in dirt, and yet, are not altogether unhappy, to whom shining tin and well scoured wood-work is an abomination, and in whose philosophy, order is without a

place or name. They are confined to no particular section, place, state, or country; we meet them everywhere and find them charmingly alike in all their distinctive characteristics. There is no discoverable difference between a Canadian, American or Scotch sloven, indeed so uniform are they in all their essential elements, that you cannot say from their products, which is which, although a cheese made by one of them is as easily distinguished from any other, as an Esquimau from an Anglo Saxon. The cheese instructor soon learns to discover his presence upon arriving within smelling distance of the factory where he stays, and upon entering the door, even though he may be absent, he the (instructor) finds confirmation of the evidence of his nose, in everything within. He sees it on the wet and dirty floor, on the stained and beloaded vats, on the cheese hoops vaneered with the accumulated filth of several weeks, and in the general disorder that pervades the whole establishment. It is however, in the curing room that the peculiarities of this species appear in the strongest light. It is here that these artists hang up their master pieces for exhibition. Some of them lean at an angle of fifteen degrees, some are thicker upon one side than the other, some are concave, others convex; they are generally overlaid with a thick plating of filthy strongly colored and highly perfumed grease skippers. Attempt to turn one of them and you will find it glued to the shelf, and if you persist in your effort you will quite likely leave a portion behind. The buyer enters and bends upon them *a rueful glance,* contracts his brow with an expressive scowl, turns upon his heel and departs to return no more. Is this picture overdrawn? I submit the question to the many intelligent buyers here assembled, without the slighest fear of a verdict against me.

THE CONCEITED MAN.

We like conceit when it is not too conceited. We confess to a little of that commodity in our own composition, and we would not give much for the man in whose make-up there is none of it to be found, but when it becomes so dense as to shut out from the mind of its possessor the light of new

truths and operates as an impassable barrier against progress, it becomes an intolerable nuisance and is one of most obstinate enemies with which the instructor has to contend. When we encounter it we know of a surety that unless we can contrive a cunning ambush from which we can leap out upon it and humiliate it, we can do nothing and are willing to depart the field at once.

We have met many of these fellows in our wanderings, and we have it to record that never in a single instance, unless we were able to suddenly overthrow them with a medium-sized thunder-bolt, forged for the occasion, have we been able to induce them to swallow the smallest portion of salutary truth, but have gone away leaving them to worship their contemptible *deities*, according to their own antiquated and fallacious notions. We encountered once upon a time a Scotch brother who, after we had brought to bear upon him every argument our ingenuity could invent to make him see the superiority of our system over his own, met us with this terse but quite expressive remark: "Mr. Harris, I think I could tak ye a leaf out your book and ane or twa out my ain and mak a very guid cheese." Of course the effect of this remark upon me at the time was paralyzing as it must have been to any one, but we found at last a joint in the gentleman's armor, and the same season we had the satisfaction of seeing him take the sweepstakes at the great Kilmarnock Cheese Show under our system.

When we see this self-satisfied individual; the conceited cheese-maker, going through the narrow round of his duties in the cheese room and living out his contracted life with no conception of aught beyond the range of his limited vision; we feel like asking this question: "Sir, had Newton, Kepier, Copernicus or Galileo been gifted with your conceit, where do you think would the science of astronomy have been to-day, and what do you think had Watt, Stevenson and Fulton have been of your mind, would we have done for railroads, steamships and the power that steam now supplies in the world's industry? Watt was willing to glean information from the nose of a very ordinary tea-kettle, while you refuse to receive information from any source. How

contemptible compared with those men does he appear who knows so little and yet thinks he knows it all.

THE WILLING PUPILS.

There is still another and far different class from any yet mentioned, whom it would be unjust to omit while upon this branch of our subject. A class of fellows who upon your arrival at their places of business, meet you with a cordial welcome, saying: "How glad I am to see you; I have heard of you often; how's your health; come in; here are the vats, here the coloring and here the rennet; Bob go and stir up the fire under the boiler. Now Mr. Whiton take full control and we will endeavor to follow your instructions and profit by them to the best of our ability." With the work thus begun, the instructor is conscious of a nameless something in his heart, that prompts him to benefit the man who has thus met him, if it is in his power to do so, his energies are quickened, his hopes strengthened, and as he takes off his coat and addresses himself to his work he feels in every nerve the harbinger of a successful day. Commencing with the character of the milk in the vats, the instructor discourses as he proceeds, the principles of his philosophy enlarging upon his theme as he works, and becoming more and more enthusiastic under the inspiration he receives from the attention paid him by his auditors, and in this way the day passes, and when the work is done all parties are in excellent spirits, and all are conscious of that feeling of satisfaction which never fails to come home to us at the close of a well spent day. These men are the Newton's, the Galileo's, the Watt's and Stevenson's of the cheese business they are the *investigators*, the men in search of information no matter from what source it may come; they are the men to whom a new idea is of more value than any consideration of personal pride, who like Goodyear are willing to make any sort of personal sacrifice for the sake of progress, and they are the men who from the very nature of things will succeed in carving upon the pillars of this age, their names as leaders in the great work of rolling onward the wheels of progress up the steep ascent to the higher plane of excellence.

THE SYSTEM WE TEACH.

It has been asserted by some makers that there is really but one system of making cheese; that the distinction contended for by some between the Cheddar system and the acid system had no actual existence, in answer to which we refer with some confidence to what seems to us a very stubborn argument. We ask such men to consult the prize lists of the various cheese exhibitions held in this and other countries during the last seven years, and see who it is who have borne away the honors on those occasions, and to then say whether there be really any distinction or no. We cannot say with certainty, but we believe nevertheless, that in every year of the seven referred to, the sweet whey system has been awarded superior honors in Ontario, and we do know that at Kelmarnock, Scotland, in the years 1884 and 1885, it carried off nine-tenths of the prizes offered. We suppose by the statements above referred to those who made them meant to say that the acid was just as good as the sweet whey system, and that just as good cheese can be made by the one as the other, and indeed this is the rock which we have found impeding our progress in many places during our six years' experience and especially in Scotland, but thanks to the cheese exhibitions, the arguments they furnished were potent for opposition and have operated effectually in removing the deep seated prejudices against us. We have met many makers who without any appearance of egotism have aserted at the outset their ability to make under the acid system, just as good cheese as we could produce under that which we teach to those we have used this argument; we have explained that the difference between the old and the new system consisted in this, that in the old the acid developed in the whey operates upon the curd very much as does a solution of muriatic acid upon a bone dissoving out of it the mineral portion of its composition, thereby rendering it less complete as a food substance than it would otherwise be, and that by the sweet system this was avoided, but this truth I found in many instances too remote and unapparent for the comprehension of my pupils, and to this day I dare say there are

many of them following my instructions who do not appreciate the difference.

It may seem to you gentlemen of this association, like wasting powder on dead ducks, to bring up in the convention a discussion on the relative merits of the two systems. You have long since settled the question for yourselves and have practically turned the old system out of doors, but in the states and in Scotland, this is not the case and in both countries we believe the old practice is still in the ascendant. In the latter country, at a meeting of dairymen held at Kelmarnock, and Sackerbie, in April, 1884, called for the purpose of considering the question of employing an instructor, a discussion arose on the subject of cheese making which indicated the Scotch idea of the subject, then universally prevaling, the degree of acidity which ought to to be attained in whey constituted the burden of the theme. All were anxious to discover some rule or standard of test, one gentleman suggesting in the course of a lengthy speech on the subject, the invention of some instrument which, like the thermometer in temperature, would indicate the the presence and degree of acidity attained. It would have brought a smile to the face of a Canadian cheese-maker to have listened to those discussions wherein it was taken for granted that acid development was the *sine quo non* to the ripening of the cheese and wherein so patent a fact as the influence exerted by the rennet and salt was not mentioned. We believe that in the course of our two seasons in that country, we met at least two-thirds of its makers and *never* in a single instance did we find one who had the remotest conception of this important truth.

Right here let us pause and reflect. It will be readily admitted that the Scotch people are not inferior intellectually to the rest of mankind, and yet here was a broad fact lying almost on the surface of cheese philosophy which ever since the business began in that country has escaped their attention; they had used salt for all the preserving purposes to which it is peculiarly adapted; they knew well enough its hardening and preserving influence upon animal tissue, and yet the idea never entered their minds that when ap-

plied to curd its effect would be the same. One pound to fifty-six was the inflexible *rate*, a fact which alone proves the truth of what we say. Again, from the beginning every cheese maker knew that the rennet principle was the digestive agent of the stomach of the animal from which it was taken, and that its natural office was to break down and disintegrate the substances with which it came in contact and yet how few there are who look upon it as performing that office in cheese. What we have said of the Scotch in this regard may be asserted with equal propriety of the great bulk of cheese makers everywhere and the lesson to be learned from the fact stated is this; if a truth so apparent could so long escape the attention of people so intelligent, may there not be others equally important and equally potent even now within easy reach of us which we have not discovered.

One more remark and we have done. We have found a strange diversity in the character of milk for which we are at a loss to account. To illustrate. One day at Aswald Grange we made cheese, our milk working much too fast we thought for the good of our product, finishing as we did at noon, while on the next at Tishbeck, thirty miles distant, we were detained until 5 P. M. with two day's milk in our tub. We sought to account for this phenomena in the soil, water, and grasses of the two localities, finding in these a marked difference but nothing that afforded a satisfactory clue to the mystery, and feeling a deep curiosity in the water, we urged the association to have samples of milk from the two towns analyzed, but for some reason this was neglected to be done. Although not always so distinctly marred as in the instance given, a diversity of milk prevails everywhere, and the traveling instructor is kept constantly on the *qui vive* for the pitfalls with which this fact besets his path traps, so cunningly set as to quite alude his notice and of the presence of which he is not aware until he finds himself caught in them, and it is with a view of urging upon this convention and upon investigators everywhere, a diligent inquiry into the subject that we have thus spoken. In this country where the milk of several dairies are brought together and

worked in a single receptacle, the difference is not so marked, because the distinctive characteristics of each dairy are aggregated and neutralized one by another; but in Scotland, the case is different, and I found in going from farm to farm a state of things quite bewildering, the working of the milk on the farm furnishing very little or no clue as to what might be expected on the next. One farm I found would require less rennet, finer cutting, higher scalding, and more salt than another, by reason of an excess of what may be called native moisture in the curd. And so the cases ran on varying a little one way and another throughout our whole circuit, and the only means we found by which to guide ourselves along the difficult course was to examine the cheese at each place, ascertain how it had been made, and shape our course in a way to avoid the errors evidenced in its composition.

ADDRESS ON BUTTER MAKING.

BY HON. HIRAM SMITH, Sheboygan Falls.

Mr. President, Ladies and Gentlemen — I am requested to give a short talk on butter making, and the secret of making butter is very short too, so it will work in together. I have taught four or five bright German boys, seventeen or eighteen years old, in the last four or five years, how to make butter as good as milk can make in one week; there is no great secret about it; after examining all the different systems of raising cream, finally settled on the Cooley system as being the simpler, and more easily taught to another person. And I therefore use the Cooley can submerged in ice-water at a temperature of forty-nine degrees. Which anybody can learn in an hour, just how to do it. The milk is brought in from the stable and immediately strained into a receiving can which has a faucet that runs into another strainer, every can holding about thirty-seven and one-half pounds of milk. The cover goes on, being about half an inch above the top of the can, held there by proper supports, we turn it a quarter around and it catches, and you take the

handles and simply set it into a tank holding four, six, or eight cans according to the size of your dairy; the heft of the tin with the milk makes no trouble, it will sink itself and be down two or three inches below the top of the water; after the tank is filled with these cans about two bushels of pounded ice is put in. Then the cream rises, and Prof. Armsby has made an analysis of the milk and only finds one-tenth of one per cent. cream left in the milk, and as I can get five pounds of butter from one hundred pounds of milk, I am satisfied with the result, that I get it nearly all. Monday night just before milking, I would take off the cream from the milk set Monday morning; it is simply done by holding the can over the spout that runs to the barrel that I keep to put the skim milk in for the calves and pigs. I turn the faucet, there is a rubber hose attached to it and I can set four, six, or eight of these cans running, and go to the barn and go to milking; the milk all runs out and the cream stays in.

When I want to fill these cans again with the night's milk I simply put the cream into a receiving can for cream, and that remains until the next morning, which would be Tuesday morning, then I do the same thing again, there we have two batches of cream, Monday night's and Tuesday morning's which are thoroughly incorporated together and warmed to about 62°, being in a room of the right temperature, then it will be in condition to churn on Wednesday morning. After the two creamings have remained together twenty-four hours we regulate the temperature before putting into the churn, and add a little coloring. This cream is not lobbard, but it frequently commences to thicken a very little, and there is a very slight acidity in the cream, this is put in the churn and the whole attached to the horse power, and the horse commences to churn, it takes about thirty or forty minutes, not often over forty. As soon as the globules of cream break or the little pellets of butter appear on the glass panels in the cover, we stop churning, throw in a little brine, so as to pour off the milk more easily. I learned this from a friend of mine in Kenosha, who had been to Chicago and taken the premium at the great dairy fair. As soon as

I found out who drew the prize, I went to interview the gentleman, and found him ready to communicate any knowledge he had, and he told me how to churn. Before that, my wife and I had worked hard skimming pans, trying to guess at the temperature. The cream ought to be churned, and labored unnecessarily hard, in order to wash up the pans, standing sometimes thirty-six or forty-eight hours in a cold time. There would be two hundred pans of milk to skim and wash up, and get ready for the next milking. Well, this was pretty hard work, and if there was any better way I wished to learn it. He told me about setting the milk in submerged cans, about stopping churning when the butter pellets appear, and the rest. I went home and told my wife, we had made a discovery, and I hoped to make better butter. We went to work. The churning stopped at the right time, and we undertook to draw off the butter-milk, and as we had put no brine in — I had forgotten that part of the directions — the butter-milk and the butter was all mixed together, it spattered over the floor some, and my wife made the remark that she didn't believe in this new fangled notion of churning. Not long after I met the gentleman on a train, and I hardly wanted to expose my ignorance, and I told him, a gentleman in Sheboygan county had undertaken to churn his new way, and he had found out he didn't like it. I told how it was done, and he says "why didn't the darn fool put in some brine?" That let me out, and I have had no trouble since.

When the butter-milk is drawn off, we then add cold brine. It should be about 50° so as to harden these little pellets of butter so they can be moved without breaking their surface, and come in a mass together. We move it very gently and after this brine has been added and the butter-milk all expelled will let it stand to drain ten or fifteen or twenty minutes, and we then add about an ounce of salt to a pound of butter. Some times more. The butter only takes up a little film of brine that surrounds each pellet of butter. There never is too much or too little. The flavor of salt goes out in the swill barrel where the hogs are crying for it, and ought to

have it, so it does not hurt to put in any quantity of salt. After this salt is put in and washed around with the paddle and the salt is dissolved, it is taken out, put upon a butter worker, and a few light pressures of the lever press out the extra brine that is not needed in the tub, and if the butter is the right temperature, it is packed. This, I think, saves much of the aroma for which people are willing to pay. You see the whole thing is very simple.

In regard to washing the cans, we occasionally wash them in summer more frequently, because if a few drops of milk get on the outside it should be washed off. There is nothing on the inside of the can but pure, sweet, clean milk, at a temperature of 45°. I have remarked that it was cleaner than any man's dish towel, and perhaps than any woman's. So it is no use to wash the can. So you see in many ways a large amount of labor is saved, and the quality of the butter is always uniform. I do not tell it to boast, but only to show the excellence of the system. For the last five years not a pound of butter has been made at my place, but what was fit to enter for a premium at any fair, and it has been done by novices in the matter.

The young man that made the butter that I exhibited at the dairy fair, in Milwaukee, in 1882, which won over $250 in premiums, had been working only about ten days before he commenced to make the butter for that fair. So you see that it is easily learned, and when learned it can be pursued from day to day throughout the year without any regard to the weather. I would impress upon every person that desires to make good butter, never to go more than two days with the cream after it is separated from the milk, and not over two milkings in the summer. I will say, in raising the cream, you will get a greater bulk of cream by lowering the temperature; you will raise all the cream in an hour or two by putting it down nearly to the freezing point, but you will have a greater per cent. of the milk with the cream. We cool the milk to about the same, winter and summer.

We have a warm dairy room double lined, filled with sawdust, and we keep it about as comfortable as a sitting room, we pay no attention to the weather outside.

Question—I have got a spring that runs into one end of my tank with water at forty-eight degrees. Do I need any ice?

Answer—You will lose a little at forty-eight, but ice is cheap. I would have ice. It would take very little.

Mr. John Boyd—I believe that a running stream at forty-eight is as good as ice at forty-five.

DAIRYING FROM A WOMAN'S STANDPOINT.

By Mrs. E. S. ROBERTSON, Viroqua, Wis.

When a year ago I was left with no alternative but that of working my farm myself, as an immediate disposal of it at that time to any advantage was out of the question, I at once set to work *in earnest* to carry out the plans for winter dairying already begun, and although I do not aspire to do as much as the Hon. Hiram Smith does with each acre, I do intend to make my ten acres of cleared land together with fifty acres of wood-land pasture and timber entirely support forty cows. This I expect to do by clearing a certain number of acres of the timber each year, having had ten done the past year and put in condition for this year's corn crop, and I shall see the last grand old tree felled to the earth without any compunctions of conscience or apprehensions for the future in the timber line, for I am sure the next generation will find no more trouble in getting a needful supply than I have in getting rid of an excess of it. Of course I except some shade trees that must be left for the comfort of the cows.

The kind of help necessary to be kept for dairying must be hired by the year, and in order to make it pay every acre and every hour must be improved, for unlike grain raising, with the idle six months eating up the profits of the other six months' labor, the summer can be passed in preparing for winter, and the winter in converting the summer's work into butter, pork, etc. The first step towards dairying was the preparation of the soil for the crops, and in that work too much cannot be said in praise of the Acme harrow, so slow-going, because

doing the thorough work of crushing, pulverizing and levelling at the same time, that your neighbor who farms on the slap-dack system will never trouble you to borrow it but once; and your hired man, who also likes to work rapidly, will give you all sorts of excuses for not using it, insisting that it will kill your horses, etc., etc., but you attach the third horse and instruct him to keep on until he has made it as fine as can be, then when he is *all through* have him go over it once more. In this way bur seed beds for the roots were made and also the ground prepared for sowing ten acres to flax, with grass seed for a permanent pasture. The flax, though exhaustive, was a paying crop; the straw containing much of the seed furnishing feed that has been greedily eaten by the young stock that have been by it, kept in a thriving condition, but on account of so much wild mustard seed sown with it, it will be my last experiment in flax. I think that many acres of rye would give better results as successive crops could be grown on less rich soil; it, like clover absorbing the gases from the atmosphere; it would be especially valuable for our hillsides where its turf-like mat would retain the soil and water and prevent washing. As it is ahead of clover by several weeks, it would give us a soiling crop that would fill the gap between an empty hay mow and a short grass field. Being entirely ignorant of the use of all farming implements, and invariably getting as answer, a "dun no" to my questions of how will we do this and that, I was obliged to depend almost entirely on the directions accompanying each, that are now made so plain that any one of ordinary intelligence can follow with little trouble. After sowing the seeds for carrots and mangels, with seed drills and cultivating first with hand cultivators, then with the horse hoe, followed our corn planting, as early as possible, on land made rich with barn-yard manure, harrowed until it could be worked with plows and "laid by" as we say, *early*, so as to give it time to mature. This treatment gave us the *best* corn that I ever saw raised in the whole neighborhood. After that the haying began. As soon as a few heads of clover blossoms were turned brown,

it was cut, cured and stowed away after the rules prescribed by the best hay doctors and though the smoking hay-mow was the scene of oft-repeated visits from myself attended by many misgivings as to the wisdom of such treatment—and a private visit to the insurance man, the hay came out in prime condition and is highly relished by all the stock. All of it, except that left out a day or two too long on account of our Fourth of July celebration, the patriotism of foreign born help for our American holiday being simply astonishing. The holiday business being their great hobby, I have decided to give them Christmas week another year, even if I have to learn to milk myself — an accomplishment neglected in my youth and excused now on the ground of being too old to learn. You will doubtless be surprised to hear that one who professes to be a dairy-woman cannot with any sense of safety get in close proximity to the heels of her cows, but who sees in the face of each, a pet and a friend in whom her future hopes in dairying are grounded. After the forty acres of grass are cared for, we harvest the flax, then the barley grown on the ten acres; that with the surplus milk from feeding the calves and the buttermilk will fatten hogs that will buy all the bran required for the year's feeding. The importance of feeding bran does not seem to be understood as it should be. I do not stop with feeding all *growing* animals, but feed the grown ones as well. Young and old, sick and well, cows, calves, pigs and even the chickens are treated to it. Thanks to Prof. Armsby and the experiment station, we are now able to explain why we defend the new process bran from the attacks of those who compared it to saw dust, after feeding it with such good results last winter. Was also glad to hear the result of feeding oil meal, as when I resorted to it last spring as a substitute for roots after they were gone, my cows eyed it askance, and seemed to regard it about as they would what it most resembled, a dried poultice — that I had, must have been wet or heated. My experience with a refractory well and geared wind-mill would be more amusing to you perhaps, than instructive, so I will leave it with the old year and turn to the new as it comes to us freighted with farm

papers and catalogues that will help us to plan for coming crops of roots, grass and grain, and for the success, that well directed efforts always bring, together with the comfort and happiness of our country home, that the harassed business man of the city would find indeed beautiful, with its freedom, its health, its winter evenings with the family circle around the fire.

Many women too, who have by necessity become bread-winners, might well adopt this, as the most healthful, interesting and profitable work they could engage in — taking it up like many of us have, not to be dropped at any time when circumstances shall favor; but as a life work, recognizing the fact, that pretty much all of good that comes to us, comes through our most earnest endeavors.

DISCUSSION.

Mr. J. M. Smith — After many years' experience, I am satisfied that Mrs. Robertson is on the right track in regard to a root crop. What variety of carrot did you raise, Mrs. Robertson?

Answer — I grow the orange Belgian.

Question — What is your soil?

Answer — Heavy clay soil that was turned under the fall previous, without any manure, and I never saw finer carrots grown than they were.

Maj. Alvord — Mr. Chairman, while commending generally the course pursued by this lady, it seems to me that she has set us a very worthy example of courage in attempting to make roots an essential part of dairying at the present day. After a good many years' trial, believing that roots were an essential of winter dairying, I have come to the conclusion that unless one has unusually good rich land, it is a mighty scarce article in the country, unless they have means of hiring labor vastly cheaper than I have been able to find it. In the last ten years we cannot afford to grow any roots for milch cows. Good as the feed is — none better — I am fully convinced that I cannot afford for making the highest priced butter, to grow roots, since I have so thoroughly demonstrated to myself that I can entirely replace

them to my own satisfaction, and the satisfaction of the cows by the silo and ensilage crop, and by the way, I must express my surprise at the small appreciation of the silo that I find here in Wisconsin. The main thing the silo will do, is to take the place of roots. I have figured this matter very closely, and have satisfied myself that I could save enough from feed corn ensilage in place of roots, to build me in the first year a good silo for that corn crop, and that its substitution for two years would build me a masonry silo that will last me years and years.

I want to speak of one other point, and that is the treatment of manure. I have as much respect for barn yard manure as anybody else, but I think the great value of it is the way in which it is handled. Manure from the stable cannot be economically handled unless it be for a garden or a garden crop, more than once. Consequently true economy indicates the carrying of the manure from its place in the stable directly to the soil where it should be applied, whether it is January or July, I cannot afford to let my manure remain until it is in poor condition. I am forced on a large farm to handle my manure only once, and to spread it from the vehicle on which it is drawn from the stable. I should be afraid to put it on leachy soil; but if I was going to put it on land plowed last year, I would sooner scratch in a little crop right on that for the purpose of saving my manure that I put on in the winter, than to pile my manure, then spead it in the spring.

Question — What would be the best for our winter dairying, to raise roots or buy corn at fifty cents a bushel?

Answer — The money you pay for your corn will raise you a crop of ensilage and store it in the silo, and one does not take the place of the other at all. That corn is a feed that corresponds to hay, helps out a short hay crop. It don't take the place of the succulent feed by any means. It is easy enough to make a silo that does not cost more than twenty cents a ton of the material that is to be stored.

Mr. John Boyd — I am a strong believer in roots. I can raise enough roots on two acres of ground for thirty-five head of stock from the first of November to the first of May.

We raise mangels entirely. Give one feed a day, and we can easily see the effect of it in the butter and the flow of milk. I have raised beets that weighed twenty pounds withont any very great work. We did not even weed them. Worked them with a horse hoe.

Mr. H. Smith — It is a matter of little consequence that there have been some little mistakes made; the fact remains that this lady has entered on the work of farming and has shown an example that will be of lasting benefit. We have learned a lesson that will go home with us, and from it I hope progress will be made. It is a good starting point that we have had here to-day, and I hope we will appreciate it as we ought.

Mr. Alvord — I am obliged to leave to-night, and I wish to say one thing. I am obliged to differ from others here on the question, at what point you will get the best results from our cows for the feed we give them. Up to a certain point in the feeding of every cow, the feed that we give goes to keep the machine moving, and every ounce we give that cow over and above that point brings us the best results in production. If, for instance, we feed a cow all she will eat of hay, and five pounds of grain per day to keep her in good flesh, where she will give an ordinary mess of milk, and she is making say five pounds of butter a week, and then by additional feed we succeed in getting five pounds more from her a week, I believe that those five pounds are the cheapest butter that we can make at an expenditure of feed, and I might say that same idea applies to your public institutions. I have been for the last few weeks visiting numerous experimental stations in the several states. I have been in some states where they are generous to them, and in other states where they go to just about that point of furnishing the station money enough to live, and then they cut it off, and the station is able to live, and that is about all it is able to do. In other words, they are giving the workers at those stations just a maintenance ration. Now, it is the dollars, the hundreds of dollars on top of the maintenance ration that is going to give the best return for the money expended.

President Morrison — When we adjourn it will be to the

Skating Rink for the evening session, where the ladies of this village have gotten up a fine banquet for every member of this Association.

Convention adjourned to 9:30 A. M., January 28th.

BANQUET.

The banquet always a prominent feature of this association, was a grand affair. The ladies and citizens fairly outdid themselves in their efforts to make the occasion a splendid success.

Every member of the association was furnished a free ticket to the banquet which speaks volumes for the liberality of the citizens of Richland Center.

Nearly 500 hundred plates were spread and that was not sufficient without repeated setting of the tables.

Music, singing and toasts followed the supper. Every detail was perfect and not a break occurred during the evening.

MORNING SESSION.

Met pursuant to adjournment at 9:30 A. M., January 28th, 1886.

President Morrison in the chair.

Myself, with others, would like to know something in regard to the practice of making cheese on Sunday.

Question — How do you get along with the extra milk Monday mornings?

O. Brown, Canada — We have plenty of vat room.

Question — Don't you get some bad milk Monday morning?

Answer — Usually do. Some patrons are negligent about keeping the milk. We send it back generally. There is no trouble keeping the milk if they cool it down, and keep it in a cool place and keep stirring it. Of course if there is a thunder storm, or the weather is damp and muggy, milk won't keep.

Prof. Arnold — Canadian cheese-makers have three ways of disposing of their milk to avoid working on the Sabbath. The first method is to take Saturday night's milk and set it for butter making, to supply the family. I should think as many as half of the patrons take that course. Then another method is to make up Saturday evening. The third method is to take special pains with ice or cold water and keep the whole of the milk from Saturday night till Monday morning and make it all up into cheese together.

Question — Can you make as good cheese Monday with all that milk as you could to make it every day?

Prof. Arnold — They make a little better cheese, actually.

Question — Is it not a common thing in market reports that first class cheese is quoted the highest price on every other day cheese?

Prof. Arnold — I don't know about that, but it is a fact that it is often better where the milk is well kept. It is, perhaps the difference in management. Under certain circumstances it is better to give the milk age. Most of cheese-makers who work with the methods which apply to every day cheese making, cannot vary the circumstances because they don't know what changes are taking place or how to avoid or encourage them. It is a common practice in Canada to work up the Saturday night's milk, and when I was acting as public teacher there, it was often after midnight before we finished the cheese making. But, I saved the boys a great deal of trouble before I got through with the Saturday night cheese-making. We kept the milk warm until it all came in, then we set it with a pretty good supply of rennet; we got the curd scalded and worked it until it was ready to pack. Then we let it lie until morning, then ground it, salted it and put it to press, and it worked splendidly. It was only just a chore in the morning to finish that up, and wash the remainder of the dishes, and then they could go to bed in season, and get through in the morning in time to go to church.

Question — Can you make good cheese after acidity has commenced in the milk? Prof. Arnold, will you answer that question?

Answer — Not as good as I can before it commences. I never have been very skillful in making cheese out of sour milk. I can make one out of tainted milk that will please you. I have got over the difficulty of handling what is called tainted milk for making cheese, so that it does not offer any serious objection to the quality of the cheese.

Question — I would like to hear how you would handle tainted milk?

Answer — I would not begin any different way than what I would other milk. I would not make any variation in the amount of rennet nor in the temperature, at which I set it. I draw the whey a little earlier and I cut a little finer. I draw the whey a little earlier in order to get the curd dry, so I can handle it as soon as possible, and as soon as it gets hard enough, so that I can get it out into the vat, to separate it and get whey off of it; I do so, and then I simply expose it to the air, and keep it warm. I let it lie until the pin holes begin to start in the curd, and then I grind it, and keep it aired and warm. It is a very essential point that you keep it warm; if you follow that up long enough it will take all of that scent out of it, and you will get a nice, clean flavored cheese. This odor which you call taint is no taint at all. The cheesy matter in that milk is just as good as the cheesy matter in any milk. This odor is a volatile oil that is native in the milk, always more or less of it, but more, under some circumstances than others. It forms in the cheese and makes it porous, as the carbonic acid gas acts in raising dough. I expose it to the air and keep it warm, because oxygen combines with carbon more rapidly when it is warm than cold, and in a little while I burn up all that oil and have a clean curd left. The cheesy matter of the milk is no more injured by the presence of this strong smell and oil than it would be if you had scented it with so much peppermint oil, or something else that makes it disagreeable. It is simply a volatile oil that can be burned out of the whey. I have burned out leeks and onions, and cabbage and turnip, and strong scented clover, simply by that process, keeping it warm; but you must draw your whey sweet.

Question — What temperature would you do it at?

Answer — Ninety to ninety-five.

Question — How many times would you grind it?

Answer — Well, it depends on the strength of the smell; if it don't go away fast enough, I would grind it two or three times. I have ground it four times. When I first undertook to carry out this flavor, I did it on a vat of leeky milk. I asked the cheese maker to change vats with me when I found he had leeky milk, and he was very glad to do it; then I explained it to him. I said: This flavor is changing, I will follow it up till dark until I get that oil out, and we followed it up till candle light, and it was a nice, clean smelling curd. We worked at it about five hours; kept it warm and it was a splendid cheese when we got through.

Question — Is it possible to handle that amount of curd successfully without a curd mill?

Answer — It would be possible, but not convenient.

Question — According to what you say, I don't see any use of ever sending home any poor milk if it would make better cheese than good milk.

Answer — That depends altogether on who handles it.

Question — Have you ever tried salting cheese in the whey instead of the curd?

Answer — Yes, but I wouldn't recommend it. It wastes salt by salting the whey, and there is no advantage in it whatever. About sending milk home when it is bad, if the cheese-maker cannot make it, he should certainly send it home. If he don't know what he can do with it, he should not take the risk.

Question — Isn't it a dangerous principle to advocate to patrons that you can make up poor milk?

Answer — Is it a dangerous principle for a woolen manufacturer to take in dirty wool if he knows how to cleanse it? The trouble is the factory men don't know how to handle it.

Question — You would not recommend patrons to deliver poor milk?

Answer — Oh, no, sir; but I will say this, there is more milk spoiled by cheese makers not knowing how to handle

it, than there is by patrons not furnishing it in good condition.

Question — What causes white spots on cheese?

Answer — The color is generally taken out by souring. Sometimes the spots come by imperfect coloring. You never find them on a curd that is drawn with the whey sweet.

Question — I understand you to acknowledge that tainted milk makes extra work for the cheese maker, and it rather, if anything, lowers the flavor of the cheese, so there is no advantage to the patron to deliver bad milk?

Answer — Certainly, that is so.

Question — If you were running a cheese factory and had several patrons that brought that kind of milk, would you always take it and not say anything about it?

Answer — I should be very likely to speak about it, because I never cared about that extra work.

Question — Do you consider that you can make as fine a cheese and as much to the hundred pounds of milk from tainted milk as you can from fine milk?

Answer — Just the same, there is no appreciable difference.

Question — And the flavor?

Answer — You wouldn't discover any difference.

Question — I never have seen a cheese, but what I could detect it.

Answer — I took you to be an average cheese maker. You may be better than the average.

Question — I think I could tell it every time.

Answer — Well, I can pick it out, I think.

Question — Will the cheese buyer pick it out?

Answer — No, they cannot tell the difference. They can pick it out the way it is ordinarily made, but if it is made after the process I have told you, they will never notice it.

Qustion — Where does the good cheese go to?

Answer — I would like to know where it comes from. I have been looking for some good cheese for a year, and have not found it yet.

THE CHEAP RATION.

By JOHN GOULD, of Aurora, Ohio.

My purpose is merely to lay down a few facts for your consideration on the subject of ensilage. I am afraid the time has come in dairying when the dairyman must have a sure crop. The dairyman has lost his grip on high prices, and in future he must reap his success by having better cattle, which may be fed with abundant, yet a cheaper ration. In other words, he must produce more cheaply, and yet find his margin of profit. In Ohio we have been afflicted about once in every three years with a drouth. So we are compelled to look up something as a substitute for the hay and clover crops, which have been so light. More than that, we realize that we must make our dairies continuous, and thus make up on the high prices of the winter, for the low prices of the summer. And that is what has brought about the silo in Ohio. We feel we must have cheap winter feed. Within a circle of three or four townships around me, seventeen dairymen are now using ensilage for the production of milk.

WHAT IS A SILO?

It is simply a box made large enough to hold from one hundred to six hundred tons of green feed, and so made that it is air tight at the side and bottom, and when it is filled with succulent feed, clover or maize, or millett, that it can be covered over, so it is shut off from the influence of the air, and then in the winter it furnishes the cows in addition to the other ration, with succulent feed, in the place of roots; of course the expense depends on how cheaply you can raise your ensilage crop, but it is not an extravagant claim to say that twenty-five tons of ensilage can be raised upon an acre of good ground.

HOW MUCH WILL IT COST TO PUT THAT INTO THE SILO?

It is demonstrated that the actual cost of raising, is about $8 to $10 per acre, including the seed. I know of perhaps

two thousand tons that were put into six silos at a cost of from 12½ to 17 cents per ton. It is done thus cheaply by systematizing the work. If we go at this ensilage business, we want to raise just as big a crop as possible.

HOW SHALL WE GROW THIS ENSILAGE CORN?

We prepare our ground just as thoroughly and fertilize it just the same as for field corn, then we drill it in with a common drill, four feet apart, using not over a bushel of seed to the acre. This will give about three inches in the row. Use a harrow and drag it several times, and at last ridge up towards the corn and go over it with the drag once more. That pushes the soil under the stalks. Whenever it it is ready to cut, which will be about the 10th or 15th of September, at about the roasting ear stage, when the younger leaves have begun to change slightly, then the work commences. Across the street from me is the largest silo in Ohio, and if you take that as a sample of how corn ensilage should be put up, I think that will answer questions for all the rest. The corn is cut with a Champion reaper, that leaves it in heaps, and two men are provided with a low truck wagon, and the man who rides goes along and picks up a heap of corn stalks, and places it upon the rack; it is not bound. Each man is expected to bring during the day, ten loads, of a ton each. We in Ohio pay for such help $18 per month and board, and each teamster cuts in the morning what ensilage will be brought up during the day. A team is provided for the cutter, for the tread power. My neighbor's silo is fifty-four feet wide by two hundred long, and sixteen feet deep, with two partitions cross-wise. An ensilage cutter is provided with a carrier and it is set near the silo, at one side, and to-day twenty tons will be placed in pit No. 1, and to-morrow, twenty tons in pit No. 2, and the day after twenty tons in pit No. 3, then the carrier is swung around to the other end, and the filling commences at No. 1 again. During these two days the ensilage will have warmed up to about 100, sometimes more than that, so we go crosswise, backwards and forwards until the ensilage pits are full, or until the ensilage corn is all cut. So you see by

this, that two men at $18 per month each, and the man who owns the pit will put in all this ensilage corn at an outlay of exactly $48.00 not including his own work, and the work of his teams. When the silo is full, there is of course, a great pressure, and that excludes the air, but keeps gradually pressing down as you work at it, and it can be kept full. The old idea was to put it in all at once, and then as it pressed down, it would sink down five or six or even seven feet. We leave our silo two or three days to warm up, then we scatter over a little straw, and lay on boards, scatter a very little wet clay over the mass, and the silo is finished.

I believe that ensilage is bound to be a great aid to the farmer in the matter of feed. You cannot afford to feed hay when you only cut a ton from an acre; but if you get twenty-five tons of ensilage corn you have an equivalent of eight tons of hay to the acre. This seems like a pretty big story, but it has been demonstrated over and over again. Three ton of this ensilage has been demonstrated to have the same feeding value as a ton of hay. Of course feed in connection with hay and grain rations, and it is the finest thing yet fed for increasing and maintaining the flow of milk throughout the winter. The cow will usually take about fifty pounds of this ensilage a day with a small feed, but if you are only feeding it as a part of a ration, they will only need twenty-five pounds, and you will get a uniform result through the winter.

A neighbor of mine who, two years ago, failed utterly on his hay, had thirteen acres of very fine ensilage corn, and he wintered sixty head of cattle without purchasing a dollar's worth. Where would he have been without his ensilage with hay at $22.00 a ton? The cows were only fed the ensilage, or the fodder corn from corn stalks, from six acres of field corn, and he wintered about forty-five cows and fifteen head of young cattle. He opened his pits in November and they were fed right through the winter until they came out on grass in the spring.

Question — Do you ever put any salt in the ensilage?

Answer — If you want to rot it right down, put in salt.

Question — What do you do if it rains into your silo while you are filling it?

Answer — Your pits have a railroad depot roof over them; you have to keep the storm out.

I think the timber silo will be more largely used in the future, for it will be built at less cost than the cement silo, and it is only a question of how long it will last as compared with the cement silo. By the old system the pit was filled so fast and so much weight had to be put on top, that it made a great latteral pressure, but by filling slowly the mass packs slowly, and there is not near as much latteral pressure, and consequently the great strength is not necessary. I cut the corn stalks into three quarter inch lengths. Clover is not necessary to be cut at all, but if the corn stalks are not cut up, it leaves air holes which must not be allowed, and you have to put extra weight. Some silos are in the ground and some are in banks. We are very largely using bank barns in Ohio — stone basement barns. We build up the stone work on the side of the hill. Our cattle are put in the basements and the silos usually cut right into the bank so that the bottom of the silo and the feeding floor of the stables are on a level. It makes much less work. If you were building it in a barn you would have to put in a row of three by sixes and three by nine studding, then on the sides you would get a solid place in which to spike your plank, but otherwise I think the timbers of your barn would hold it all right. The side walls of your silo should be true on the inside, so that the mass will fall down evenly day by day, as you take it out. It is not necessary for your silo to be in the ground, but you must have it air tight.

The ensilage will not freeze when you are taking it out. You will find it not far from 85°, and I have never known them to freeze more than an inch from the outside. The door is made double in three sections, then you will use the top door first, then down to the next, and in filling when you have got your silo full, shut your doors. Make a little plaster of some kind; I have seen stiff clay used. Plaster it up on the outside, and that makes it heremetically sealed. When you begin to use the ensilage you take out the planks

and pile them up, and let the air work slightly upon the silo, and if there is extreme acidity it takes it away; the smell very largely disperses. The corn I use is a sweet corn, that comes from Virginia, very rank, grows very high, with a great mass of foliage upon it, which is very largely charged with sugar. It grows about fourteen feet high. The seed costs us delivered $1.10 per bushel, fifty-six pounds. We buy of Mr. Burrill. You had better order from Cornish, Curtis & Greene, of Fort Atkinson, they are the agents now for this part of the country. We don't use any weights at all while we are filling, nothing but its own pressure, one batch after another, and it settles down as the hay in the mow settles down. The advantage of ensilage over dry hay or other feed is that it holds the succulent character of the feed. It will cost you just as much to set up your poles and get your corn put in shape where it will keep out doors as it will to put it in the silo. And in the silo you can control it; you can keep it in succulent form and the weather has no effect on it, and you will find that you will have more milk and more cream if you feed it in the form of ensilage.

Prof. Arnold — The point is simply this, that in the green the albumen and other matter is to a large extent, already in solution in a condition in which, when it is separated from the fibrous matter, it can be taken right into the circulation and appropriated.

In the other case all this matter is dried down into a hard condition, and must have water to re-absorb it; freshen it up and dissolve it, which requires a good deal of time and a good deal of extra force. If you take an apple you will find the nutriment all in a soluble condition, and when you take it into the stomach, it is ready to go into the circulation at once. If you dry that apple all the nutriment becomes like raw hide, and it must be soaked up, and when you have done that you have changed its condition; you never can get it back in the same condition it was before the drying was done, and it takes extra energy and force to digest that dry food, than in its green state; that is the pith of the whole matter.

Mr. Faville — If this dried feed was cut up and wet for twenty-four hours before using, wouldn't that help?

Answer — It will help considerable, but it would not overcome the change which the feed undergoes in the desiccation and soaking up again.

Mr. Gould — There certainly must be a natural value in the natural juices, that is not in the dried hay, because it has been demonstrated that three tons of ensilage has a feeding value of a ton of hay, and we know that a ton of ensilage only weighs about nine hundred pounds, by the time we get to using it, and a ton of hay weighs eighteen hundred pounds, and a large percentage of the corn is water.

Prof. Arnold — The nutriment or the sugar are not necessarily changed by the evaporation of the water, but it is simply breaking the chemical union of the water with the rest of the compound, and that chemical re-union has got to be restored by the energies of the stomach, which makes extra work and makes it slow. In feeding a cow you want to give her what she can eat in a given time. A dry feed may contain as much nutriment, but you cannot get as much out of it because it takes so long to do it that the animal has got to support itself while it is being digested.

Prof. Henry — Four years ago I hung up in the court house of your city a chart of a silo, and gave you the first talk on ensilage that you had had in this place; from that day to this I have been more or less in favor of the silo. It won't make a shiftless man thrifty; it won't make a poor man rich; but it is an adjunct, I think, to successful farming; to concentrated farming; to a man who has but little land; and that is the kind of farming that I hope we are getting toward. Mr. Gould has shown the advantage of putting a tremendous big crop in condition to feed it, but you must remember that if you grow a tremendous big crop, and feed it properly, and keep it properly, you still have a good thing; of course the ensilage keeps the water in the fodder, there is about seventy-five per cent. of water in the ensilage. I believe that ensilage is far superior to root growing. I don't think you can afford to raise roots, if you get only twenty-

five cents a pound for winter butter. I believe the silo is a good thing; I believe that the growing of a big crop of corn is a splendid start towards successful farming.

Mr. Hoard — I want you to tell us your experiment with the twenty-six rows of corn-fodder, and the percentage of increase of butter and milk, by changing from the dry corn to that.

Professor Henry — I cannot give those figures. Now, farmers, you have come, some of you, a long way to this convention. I want you to take home something practical that you can use, and I believe that the one thought that Mr. Gould has brought here is worth more to you than the whole expense of this convention. You want to go home and think it over. Talk it over. If you don't want a large silo, make a little experimental silo with old boards. Try it one year and, if you think it is going to work, make a good one. If you go to work and put two or three hundred dollars into a silo you may regret it.

Mr. Beckwith — Did you have better results from that large corn you spoke of than the corn you sowed this year — the Stowell's Evergreen?

Answer — I sowed the large corn, some four acres of it, and fed it before the Stowell's Evergreen was large enough. Along in July I think the Burrill corn is best, but after it becomes more mature, the cows eat too much of the stalk.

Convention adjourned to meet at one o'clock P. M.

AFTERNOON SESSION.

Convention met pursuant to adjournment, at one o'clock P. M., January 28th, 1886. Mr. Adams in the chair.

SOME OF THE TRUTHS TAUGHT AT FARMERS' INSTITUTES, THAT CONCERN DAIRYMEN.

BY J. M. SMITH, Dairy Editor *Cedarburg News*, Cedarburg.

Out of the many lessons that have been taught in the Farmers' Institute, considering the time, and some money

that has been spent to attend them, by the hundreds, and in the aggregate, the ten thousands that gather to hear the truths dispensed; and from the pains taken by the *Milwaukee Sentinel*, and the *Herold*, its Germany contemporary, and by the local press wherever the Institute is held, to report a good share of the juice of the proceedings, the people of the state, ought to get, and I believe are getting, a liberal addition to their stock of valuable knowledge. But still there is great danger that much will be lost, because of the negligent habit so many have of putting this fact and that fact in proper relation to each other, so that the whole lesson the parts teach is comprehended to the end that practical knowledge, and better practice results.

One fact, many times brought out is, that a highly fertilized acre planted to common field corn, and cultivated as the modern cheap and easy methods prescribe, harvested and fed in the best manner, yields an enormous amount of good feed for cattle, when properly admixed with other foods—more many aver than any other forage crop heretofore generally raised in Wisconsin. In connection with this it has been shown that an acre planted with mammoth, sweet or ensilage corn, yields more and better fodder still, indeed so much, that its bulk and weight and feeding value is immense; so great as to be hard of belief; but still it is below the truth to say that any acre that will grow a crop of fifty bushels of shelled corn, will grow not less than twenty-five tons of ensilage corn—weighing it in the green but nearly ripe state, or when fit to cut; and those twenty-five tons have a feeding value, after being cut to half-inch lengths, and properly siloed, equal to eight tons of best meadow hay, that is cut, cured and fed in the usual way.

It has also been stated in connection with this, that though there are only 900 pounds of dry solids in three tons of sweet corn ensilage, and there are 1,800 pounds of dry solids in good hay per ton; still the 900 pounds of silo food is its equivalent in feeding value. This seeming absurdity was not at first satisfactorily accounted for. The feeders knew the results, but science later on, came with its light and showed that it takes an expenditure of what is called "force" in the animal

economy, chiefly gastric juices of the mouth and stomach, to prepare the dry food for assimilation and use, and so much fails to be fully digested or utilized, and so is so far lost for the purpose of making milk or meat, that what remains from the 1,800 pounds of solids, in a ton of hay is only equal to the 900 pound of solids and three tons of corn ensilage, the silo having so thoroughly done the work of preparing and keeping the food in a digestible condition that none of the so-called force is wasted in useless efforts in masticating substance that is not assimilated. This view was substantiated by Dr. J. J. Bunn, the eminent physician and scientist of Sheboygan, in the Institute held at Sheboygan Falls, and has also been fully endorsed and explained in this meeting by Prof. L. B. Arnold.

Some yet say that in holding up such pictures of such great crops and the results of feeding them, the dreamers theorize and warn the uninformed that there is some delusion about the business, and aver it is not certain the claimed results would materialize. But the presence of 6,000 silos in the United States, and the facts in relation to their results are now so patent that the skeptical are only advertising their own lack of information. It is now conceded that twenty-five tons is not an unusual yield. This twenty-five tons of green ensilage will not shrink more than ten per cent. in weight in the silo, and so will leave 45,000 pounds of succulent food.

We will assume so much as settled and go on. Although it has been found that such silage, made of the more mature maize than the very green and succulent kind that was tried at first, will, if mixed with some grain feed, make a fairly good ration for cows. Still, it is yet held it is better to have some dry hay or straw fed each day; although it is conceded the cows eat but little of such dry food, even when they have a chance. But as a correct rotation of crops should be commended, let it be supposed that an acre of barley, and an acre of clover is given elsewhere on the farm to be used to make what the feeders call a "balanced ration." With such farming as is commended 45 bushels of barley weighing 2,160 pounds and containing an equal weight of straw

will come from one acre, and 6,000 pounds of clover hay from the other acre. This will give, in round numbers, 55,000 pounds of food mixture.

Another fact, often aired at the Institute meetings, is that clover, independent of this ensilage question, yields a vast amount of food for all kinds of stock; and, for the reason that it takes seven-tenths of the elements of its growth from the inexhaustible air, has a great wealth of fertilizers in its roots, that are useless for any other purpose, and will therefore abstract fertility from the air, and add it to the soil on which it grows, but adding most, if plowed at the time it reaches maturity, which is at the time of its first or second full blooming, the next year after the germination of its seed.

Another fact is that between the times of raising the corn and clover on the same plat, there should be a crop of small grain, oats or barley, raised with which to sow the clover seed, and also to furnish through its grain a larger per cent. of protein, and a less proportion of carbon than the others furnish. It has also been thought that to sow plaster when the grass seed is sown, makes sure, almost, the life of the tender clover plant.

All these crops should be raised to the end that the forage and the grain may all be utilized on the ground by feeding them to animals, and thus have the least bulk and weight to buy or exchange, to get the oil meal, or both, that should be used to more properly balance the rations, and give variety thereto.

We now have, as previously shown, the crops all grown, and weighing 55,000 pounds from the three acres, and are ready to feed, say two really good butter cows, weight of each, 900 pounds. It has been fairly estimated that 100 pounds of such a mixture, one-fifth of its weight in the dry state, will feed the two cows one day. In 365 days they would eat 36,500 pounds of it, and would thus leave the value of the rations for 185 days, to be exchanged for bedding, bran or other food. Is there anything loose or loony so far?

Now the ration above, supplemented with the value of what the uneaten part will pay for in the bran form, will make a

good butter cow yield the milk that will make 250 pounds of butter per annum, and she can't help herself, if decently treated; and she will give you a calf, within the time, besides. The two cows will give 500 pounds, or the land, thus used, will yield 166 pounds of butter per acre.

It will be seen that the regular corn crop, or the ensilage corn crop, the small grain, the clover crop, and the feeding animals, whether for dairy purposes or other uses, are all inter-dependent, all essential links in the complete chain. By this I mean that you want the whole series. You can't do anything profitably with the silo food, but feed it on the ground, and as it comes out of the silo. You can't raise the big crops without the animals to convert the "roughage" into manure; and you can't rightly fertilize the manure without some grain ration added to the "roughage." Each is a part of the whole; and you can sell nothing for an income, but animals, and their products of meat, milk, or wool, as the case may be, and that is just what it should be, when farming high-priced land, or that which has been depleted through exclusive grain-raising. If you enter upon the course with intelligent driving, you will certainly win the race; if you don't, you may be a "stint farmer" and will ride the "distanced" horse.

If it be objected to this "lay-out" that it leaves pasturing out of the programme, it is replied that this as near as may be, and still have small share for exercise during fine weather is, undoubtedly, the better method on very valuable land. Many Wisconsin farmers now know that the pasture grass their cows crop on tillable land is the costliest food they consume. But it is rare a farm that has not on it some land that would not be suitable for such a rotation, as has been noted, and that could be taken for steady pasturing, and partial soiling practiced.

Or, if all the land was arable, and a farmer could not advance beyond the pasturing, then he could pasture half of his clover field till he was converted to the belief that he was making a mistake by so doing, which would not be long if he kept strict accounts and kept his eyes open; that is if he was farming arable land worth $50 an acre. So Horace

Greeley said long years ago. But whatever he might do about pasturing, he wants the big crops in the rotation named, and the saving of all the liquid and solid manure to apply as fast as produced to the corn land, and then he will find that the fertility of the farm will so increase that his changes will have to be more months to consume the products of the land, and more warm stables to shelter dairy growing or fattening stock, according as his tastes and judgment determine.

Now if the testimony of many of the most intelligent farmers in the state, as they have given it in at the Institute meetings, and corroborated by the able helpers from outside the state, is worth anything, then the end, in due time, of such a way of farming, is just as certain as the beginning; and a second farm, when measured by the increased fertility, can be piled on the top of the first one, far cheaper than to buy and skin another one, outside the area of the first. The added beauty of this whole method is that the more run down the farm, the more the farmer needs to begin at once, and the greater per cent. of increase over the present good farmer will he get.

As the bulk of the farmers of this state now work, they do not make more than 125 pounds of butter or 325 pounds of cheese, or get the growth of a steer from two until he is three years old, on each four acres of the farm. If they do not run to neat stock, and depend upon selling grain, it don't take but a few years to deplete their soil so that they have even less earnings per acre than from keeping a cow on each four acres. The yield of butter is now less than 35 pounds per acre; the yield of cheese 80 pounds; and wheat land not fertilized by some means, yields about 10 bushels. That history would describe the bulk of the farming in Wisconsin and would not greatly belie many of the farms that lie right around and among those that accomplish more and better things. Now take the better method of raising big feeding crops, in correct rotation, feeding them on the ground in warm, clear, airy stables, saving and applying the manure rightly, that is made through such a course, and compare the results.

You will see that is many fold above the averages of today; and to rise to the accomplishment of even half so much would both put money in the farmer's farm and in his purse, and would enable him to solve the starving problem that confronts us all — how to cheapen production.

Of course this does not cover the full bill of particulars, but the farmer who can comprehend and really do so much as the general plan involves, will not be slow to learn the smaller principles of success, to wit: the best seed, cultivation, time of culture, methods of harvesting, housing and feeding; the absolute necessity of warm barns, and the non-sheltering of stock in the fall or spring, during rain or snow storms; the treatment of the fertilizers; the right kind of stock to feed, and what to do with the milk or meat.

Best of all, the farmer, who has achieved in a fair degree the results outlined will have improved the stock of humanity in himself, increased the sum of his knowledge, which is better than gathering diamonds; will have elevated himself from the drudge to the realm of the thinker, and from the just profits arising he would be the independent man, rather than the slave of toil and embarrassment; could enlarge the world in which he lives through the reading of good books and papers, through travel and commingling with his fellow men, could wear off the angularities of the man of mere muscle, and feast upon the wonders of nature and art, as he never would if he did not get the aid of an enlightened brain to help him earn the money it costs to know something. No man who has to pay his own bills can take any true comfort in spending more than he does now, unless he can honestly make his gains greater, and to help the farmers of the state to do the latter is one of the high aims of the Farmers' Institutes of Wisconsin.

SECRETARY'S REPORT.

Mr. President and Members of the Association:

During the past year I have paid out for office expenses $109.17. This has been paid out for postage, stationery,

freight and express on reports, telegrams, etc. A bill of items furnished the Executive Committee.

The reports that are not sent out by mail are distributed through the president of this association, at the Farmers' Institutes, the utmost care being taken in their distribution.

I had hopes at our last meeting of reporting the premiums due this association ($400.00) from the World's Exhibition, at New Orleans, paid, which would have paid nearly all of our outstanding indebtedness, incurred in making the exhibit last winter. It has not been paid, nor any portion of it.

At a meeeting of the Executive Committee it was thought best to pay up all of the accounts which has been done.

For the past year the Executive Committee have been trying to devise some way, with the means at their command, the best way to instruct the creamery men, and cheese factory men how to make a better quality of butter and cheese.

The following resolution was passed:

Resolved, That the state be divided into three cheese factory districts for the purpose of a system of factory inspection and instruction. The headquarters of District No. 1, be at Sheboygan Falls; District No. 2, at Fond du Lac; District No 3, at Fort Atkinson; that for the purpose of this system the Dairymen's Association hereby appropriate six hundred dollars; two hundred dollars to each district, provided that a like sum be raised in each district. The association appropriation to be equal in all cases to the sum raised by the district and *not* to exceed two hundred dollars.

The districts will be made at the meeting of the Executive Committee in April.

Respectfully submitted,
D. W. CURTIS.

TREASURER'S REPORT FOR 1885.

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 hand of treasurer as per last report	$91 74
Feb. 27	Memberships	173 00
	Entries to Dairy exhibit	4 50
April 30	From state treasurer	1,000 00
		$1,269 24

DISBURSEMENTS.

Feb. 26	F. F. Morgan, printing	$2 50
	Mrs. Kelly, hotel bill	19 02
March 4	J. A. Smith, expenses attending Arcadia meeting	8 00
11	Premium, Arcadia Creamery Co	10 00
	Stephen Favill, expenses attending Arcadia meeting	17 45
17	Premium, Miss Joshua Rhodes	8 00
19	Mrs. Kelly, reporting meeting	50 00
24	W. D. Hoard, printing	23 50
April 9	Executive committee meeting, W. H. Morrison	5 00
	Executive committee meeting, S. Favill	5 00
	Executive committee meeting, W. D. Hoard	5 00
	Executive committee meeting, C. R. Beach	5 00
	Executive committee meeting, A. D. DeLand	6 20
	Executive committee meeting, H. Smith	6 20
	Executive committee meeting, H. K. Loomis	6 20
April 9	Room at Plankinton House to hold executive meeting	2 00
30	W. H. Morrison, advertising cards	3 50
May 5	A. D De Land, for work of C. Delow, at New Orleans,	10 00
5	D. W. Curtis, salary as secretary for 1884	75 00
Aug. 1	D. W. Curtis, for use of office	25 00
4	Freight and reports	80
4	Drayage on reports	15
1886.		
Jan. 11	D. W. Curtis, use of office	15 00
11	Robt. McAdam & Sons, on box cheese	7 15
23	E. Casswell, for two boxes cheese	13 54
	Postage	30
	Exchange on drafts	1 40
	Hiram Smith, expenses attending exposition at New Orleans	106 00
	H. D. Fish, expense attending exposition at New Orleans	100 00
	A. D. De Land, labor collecting exhibit for exposition,	100 00
	D. W. Curtis, labor collecting exhibit for exposition	100 00
	W. D. Hoard, printing	37 75
	D. W. Curtis, for office expenses	35 98
	Exchange on drafts	65
	Postage	08
	Balance in hands of treasurer	457 87
		$1,269 24

Respectfully submitted,

H. K. LOOMIS,

Treasurer.

On motion, the report was adopted.

SUCCESSFUL DAIRY FARMING IS DEPENDENT ON THE THREE R's, R's, R's—RICH THINKING, RICH SOIL AND RICH FEEDING.

Hon. HIRAM SMITH, Sheboygan Falls, Wis.

COMMON SENSE IN DAIRY FARMING.

It is difficult in this inventive age, to construct a sentence to which different meaning may not attach. If we speak of an incident where a man exercised good judgment, we say he used common sense. If we speak of common lumber, it is understood to mean a poor quality. The legislature of New York enacted a law that it was a crime to sell fraudulent butter; or a substitute for genuine butter; but the court of appeals of New York said that to sell fraudulent butter as a substitute was no crime, but to sell imitation butter for genuine butter was a crime; although they knew, and everybody knows, that the substitute was a fraudulent imitation of butter, and could only be sold to the consumer by gross deception, which is a crime. Therefore I will not attempt to define the meaning of common sense in dairy farming; but simply describe two systems of dairy farming, and you can decide to which system common sense ought to apply. About fourteen years ago I was engaged in dairy farming with 45 cows on 200 acres of land, keeping them as most dairymen did at that time, and many do still, mostly on pasture grass in summer, and on hay in winter. The cows came in about the first of April. The milk was made into cheese in the summer and a very little butter in the fall, and the cows dried off on the approach of cold weather; many of them were dry three or more months of the year.

No adequate provision was made for watering the cows in the barn yard during the winter, and frequently the water in the shallow wells would fail. The cows then had to be driven one mile to the river, where holes in the ice were cut and the cows had to get down on their knees to drink ice

water, subject to be driven away by master cows, and many returned to the barn without procuring water at all that day, greatly to their injury in health and comfort. Becoming enfeebled by exposure to cold, and starved for the want of water, the "cow doctor" had to be employed to cure what he generally called "Murrain," a disease he knew as much about as he "did about the supposed condition of the Lost Angels." The stables, could not without great stretch of charity, be called anything but a "wind break," and the frozen manure was thrown out of the stable windows, there to remain until the following autumn, or until the ammonia had escaped by the fermentation of the pile in summer, and the phosphate in the form of a salt had been washed out by the rains and the eve droppings from the eves of the barn. This manure originally had but little value for the want of bran, oil meal, or some nitrogeneous food, that should have been fed to the cows, and when it was eventually put upon the land, it made so little demonstration, that the farmer would say his land was rich enough without manure. It was so rich, he would say, you can't tell where the barn-yard manure was spread. Well we know now that the farmer told one truth and one lie, and you will have no difficulty to determine which was which.

Manure that has lost its phosphates and its ammonia is like mortar that has lost its lime and water; it is but a rope of sand to depend on. Fertilized manure is as essential to a thriving farmer as capital to a business man; without them they both go to the wall. The dairy farmer who depends entirely on pasture grass for his cows in summer is usually forced to pasture his meadows, which year by year deteriorates, so that he can obtain only one half a ton of hay per acre. The profits of this kind of dairy farming are nowhere, and can only exist during war prices for products. It was largely practiced fifteen or twenty years ago in northern New York, on the western reserve, and throughout the northwest, and is still practiced by a very large proportion of dairymen east and west, and any innovation from this old method of dairy farming is styled by the "Old Fogy" as dude farming. There is another system of dairy farming

now being introduced, by a different kind of dairymen, who are ready to substitute the demonstrated facts of to-day for the conservative guesses of the past; who have sufficient intelligence to welcome discovered knowledge, relating to his business, whether that knowledge comes through his hired man, or some professor of agriculture. It is the knowledge he desires and not the vehicle through which it is conveyed. He recognizes that an enriched soil is the substratum on which all successful farming rests, hence he studies and experiments how he can most cheaply fertilize his manures. He knows as a business man knows that if he checks out money from a bank he must first make a deposit; it is no less true with the farmer; if he check out productions from his farm he must first make deposits of such ingredients as will produce the crop. The observing dairyman has learned by experiment that the solid and liquid manures combined will double the crop. The chemist tells him that it is because with solids alone manure is one-sided; that it requires a combination of the solids and liquids to get the full benefit of either, and both.

The strength of a chain is determined by its weakest link. The real value of manure is determined by its combinations. The observing dairy farmer has learned that manure made while the cows have been liberally fed on bran, oil meal and other nitrogeneous food, and taken daily from the stable to the corn land has three to six times the value of manure when cows are not so fed. The agricultural chemist tells him that the fertilizing value-of feed is not diminished by first making use of its feeding value; so that the dairyman using freely of nitrogeneous feed for his milch cows gets double value, one its feeding value, and one its manureal value, either of which is equal to its original cost. The progressive dairyman, after having learned the first great lesson — how to produce cheaply large crops — he is then anxious to learn an equally important lesson—how to mix the carbonaceous and nitrogeneous feeds so there shall be no lack of one or excess of the other. This knowledge will avoid all waste of the productions of the farm. If there has been an excess of rough feed produced the purchase of

oil meal and bran mixed with the rough feed will make a profitable ration for any kind of animal. Having learned how best to produce and how best to mix feeds, he will be anxious to save what has been profitably raised and properly mixed. This experience will teach him to provide warm barns for winter and cool stables for summer, and an abundant supply of pure water at all times, in the yard or field, or both. The next important question to settle is, what kind of cows will produce the greatest value in butter or cheese from the amount of food consumed. This will be the better learned from experience than from advertisements. If the progressive dairyman has learned all of the above, it will require no great stretch of intellect to have his cows give their greatest flow of milk when prices are at their highest. If he is farming for money and not for fun, it will not take him long to determine that on high priced land, soiling and silos will add to his gains.

After having brought the details of dairy farming down to the production of milk, the question is, how shall it be manufactured? Experience has taught me that if forty or more cows are owned by the dairyman, on the farm is the best place to manufacture. If butter is made the cream can be separated from the milk by rapid cooling of the milk in ice water, and the milk remain sweet for growing pigs or calves. The cream when separated, should be tempered to sixty-two degrees, and remain to ripen twenty-four hours before churning, with no unripe cream added during the last twenty-four hours before churning; the churn to revolve with a steady motion until the cream breaks, when a little cold brine should be added to cool the butter and separate the butter from the buttermilk. Draw off the buttermilk, wash the butter clear from the buttermilk with cold brine, let it drain a few minutes, add one ounce of salt to every pound of butter, while in the churn. A few revolutions of the churn brings the butter in a mass, after which it can be taken on to the butter worker and slightly worked. If the temperature of the room is at fifty, it can be packed as soon as it is not too hard or too soft, to work pleasantly. It

should be stored in a refrigerator and sent to market every week in the year.

I have patiently if not carefully described two systems of dairy farming, and will leave to each one present to designate to which system common sense belongs.

It may be pertinently asked if this latter system of dairy farming will pay? for that is the true test of all business transactions. In reply to such question I will state that fourteen years ago I was keeping forty-five cows on two hundred acres of land on the first system of dairying described, and the gross sales from the farm were about $1,900. At the present time I am keeping sixty-seven cows on the same farm, and the net receipts are $2,100.

DISCUSSION.

Question — I would like to ask how much you get for your butter, and where you sell it?

Answer — I get thirty cents, and sell it in Milwaukee, by the year.

Question — I would like to ask about how much butter you get to the acre?

Answer — Under the old system I got about forty pounds of butter to the acre, on the two hundred acres. In 1884, I got sixty-two pounds of butter to the acre on the two hundred acres, and carried some young stock besides. The true test of what a dairy farm is producing is how much butter do you produce on the acres you own? It is no fair criterion to say how much a cow will make, because I don't know how many cows a man has on his farm, but I want to know how much butter he is producing per acre, that brings it to a definite point, and settles the question of profit or loss.

Question — Is thirty cents a fair price for good first class butter, where we have to send to market to be sold through a commission house?

Answer — The year before my present contract commenced, I sold to a commission house in St. Louis, and shipped every week, on the condition that I was to draw the highest quotations of the Elgin market, and it averaged

thirty and one-half cents, during the year, and butter was higher at that time than this year.

Question — You say if you feed your meadows in the fall, that you will run out your meadows. Do you lay that down as a fact in Wisconsin?

Answer — I lay that down as a fact worked out by eight or ten years positive knowledge.

Question — I have meadow that has been down eighteen years, and this season have cut as heavy hay from it as I ever did, more than two or three tons to the acre.

Answer — I couldn't afford to make grass, if I couldn't get more than three tons of hay from it. It is in the nature of the clover plant to run out if it is not re-seeded, and where the cows eat it all off, there is no seed, but where it is re-seeded, the crop is replenished.

Prof. Arnold — You said something about putrified milk, Mr. Smith, did you ever have a case of putrified milk in our factory?

Answer — I have had more than a huudred lots of it.

Prof. Arnold — Then you have had something that I never saw. Milk that was sweet and yet putrid. You have had bad smelling milk, but do you know it was putrid?

Answer — We will come together by applying the word tainted.

Prof. Arnold — No, I don't accept that. I wish to be precise now. As is stated this forenoon, what dairymen are in the habit of calling taint is not putrefaction. It is simply a strong smell, and is as far from taint as the admixture of strong smelling oil like peppermint oil would be in the milk.

Mr. Hiram Smith — It has been a great source of trouble to factory men all over the northwest that their patrons have so often brought tainted milk to the factory. If the sentiment goes out from this State Dairymen's Association that the cheese maker is to blame, he can make good cheese out of it if he wants to, it puts another goad into the hands of the patrons to be more careless of their milk. I take the ground from twenty years experience that in the climate I am in there is not the slightest necessity for tainted milk or impure milk of any kind. It should be brought, and it is

brought, to more than one hundred factories in the county of Sheboygan, and not a floating curd among that lot. Simply because they have learned how to take care of the milk. It is much easier to teach a patron how to take care of his milk than it is to teach here and there a scientific gentleman how he may fight total loss. It may be an interesting discussion between professors of agriculture how they may save tainted milk, but it would be an expensive luxury among the factory men and patrons of Wisconsin. The patrons should be impressed with the knowledge that on their shoulders rest the responsibility of furnishing good milk, which they can do.

Mr. T. D. Curtis—I have not understood Prof. Arnold as recommending the delivery of tainted milk, as you call it, to the factory. He has simply said that with a great deal of work and skill it can be made into goood cheese. Not fancy cheese; but then what right has any purchaser of milk to accept double labor in the production of an article, or extra skill in its production. I want to ask my friend Smith how many acres he thinks, of his land, ought to sustain a cow?

Mr. Smith—I think two acres will do it.

Question—What is a fair average yield of butter for a cow, take the herd through?

Answer—About two hundred pounds.

Question—Then, one hundred pounds would be a fair average per acre, wouldn't it?

Answer—It would.

Mr. Hoard—If you had cows that were making 250 or 300 pounds instead of 200 pounds, it would be an advantage, would it not?

Answer—I couldn't very well deny that. I hope to reach that. But I am here to report what I am doing at present. I am working up to a higher point all the time, but I have nothing to report beyond what I have said.

Question—How much plaster to the acre do you use?

Answer—I use a half a bushel of plaster to sow on every acre of grass and corn ground. I don't put plaster anywhere except on meadows and the fodder corn. I sow the plaster

the fore part of May, just as the grass begins to start. If it is a wet and warm season, perhaps I do not see the good effects of it as much as a dry season, because I should have good clover without the plaster, but I have nobody to ask whether it is going to be a wet season or a dry one, so I put the plaster on.

THE VALUE OF CORN STALKS FOR PRODUCING MILK AND BUTTER.

Prof. W. A. HENRY, Madison.

I see in the back part of the room a large number of those whom I judge to be High school scholars, lads and lassies. Prof. Smith has kindly dismissed school to permit them to come here; if I could be with those scholars in the school room or meet them here, I would like to spend a half an hour talking with them about our future, their future and my future. Only five years ago I left the school room myself. I graduated in 1880. They called me an old boy in the class, but I felt young. I was twenty-six years of age. Boys, when I started to college the second time, after having started at nineteen the first time, and had to stop when my money gave out. I started to save the first dollar to put me through college when I was twenty-three years old, and by working at days work on farms, I managed to get through.

I remember a boy in the next class below me, his father owned a plantation in South Carolina, near Columbia. The boy was something over six feet tall, dressed in a rather shabby business suit, and his hair was not cut the way the Northern boy's was. I judge his mother had worked on the job; he was rather an odd specimen. I said "Holmes, what brought you North?" Well, he says, "down where I live the farmers are miserably poor, and I have come North to study agriculture, and if I can go back South and help those people, I am perfectly contented with my life work." He landed at the Cornell University with fifteen dollars in his pocket, but he managed to stay there and go through college although he had to eat his dinners, as I have seen him, from

a barrel head. That young man is now at one of the southern universities, doing just what he proposed to do, and at a good round salary, and he is highly honored by the southern people. I tell you this to impress one point upon you, don't any of you ever say, if you have health, and no peculiar family duties to perform, that you cannot get an education. But, if you can't go to school or college, through any unfortunate circumstances, you can still be a student at home. The most essential factor in a boy or a girl to lead to success is an inquiring disposition. They must be hungry for knowledge, and any boy or girl can cultivate that. I had a young man write to me a short time ago, "I cannot come to college, I want you to help me." So I marked out a course of study for him, and I am getting just such letters very frequently.

We have in the State University this winter, something that may interest some of you. We have a short course of agriculture; there are twenty-two in the class, and Dr. Armsby went back last night that he may talk to them to-day. We are giving them each day a talk upon agricultural chemistry, botany, etc. They are studying grasses and drying specimens. They stay three months. The total expense is about $60. We have a very successful class and a pleasant time. That $60 includes board and tuition and books. The oldest student is twenty-seven, and the youngest nineteen years of age. Then we have a four years course, in which two young men graduate next June, one is the son of Mr. Beach, who read a paper here yesterday.

You may ask me what is the use of studying, specially if you are going to be a farmer. I think that you can see from the discussions here that these men are constantly needing more light, the best of them, and this friction of minds has greatly helped along towards the development of such knowledge. I wish that we had more young men to fall in the line of experimental agricultural work and teaching. I am constantly receiving letters asking for teachers in agricultural schools or competent young men to take charge of farms. I believe that a young man taking an agricultural course in one of our colleges has about the broadest course

in the college. I am just as proud in my position as the professor of Greek is, dealing with his subjects two or three thousand years old, with all respect to those old temples and gods, and I want these boys and girls to feel that the farm is just as big a place, and that it will pay just as good interest or percentage on the investment of study and intelligence.

CORN-STALKS COMPARED WITH MIXED HAY AND CLOVER HAY FOR PRODUCING MILK AND BUTTER.

Prof. W. A. HENRY, of the Wisconsin Agricultural Experiment Station, Madison.

The following described experiments were conducted to ascertain:

1st. The relative values of corn fodder and mixed hay for producing milk and butter.

2d. The relative values of corn fodder and clover hay for producing milk and butter.

3d. The amount of milk and butter an acre of corn will make when fed to milch cows.

4th. The value of an acre of corn when turned into milk and butter.

All the materials fed were good of their kind, the corn-stalks being from a lot described further on, cut early, and well cured in the shock and bound into bundles, after husking the fully matured ears. The mixed hay was about one-third clover and two-thirds timothy. The clover hay was from medium red clover, cut early enough to preserve the leaves and heads in good condition. The corn-meal was from Kansas corn, thoroughly dried and ground fine. The bran was Minneapolis new process.

The hay and fodder were fed long, thus necessitating much waste with the corn-stalks, which might have been avoided by running the stalks through a cutter, but as this

was a preliminary trial, it was deemed best to take each fodder in its simplest form, leaving other tests to show us the loss by feeding in this way.

Four excellent butter cows were selected and divided into two lots of two each, of equal capacity for producing milk and butter as near as we could judge. During the trials they held their weights and maintained their appetites so well that no further mention need be made of these points.

In every trial a week's preliminary feeding preceded the two weeks of actual test, this time being considered necessary for accustoming the animals to their diet, and to get the full effect of the food on the milk.

In the first trial the ration of Lot I was five pounds of corn meal and seven pounds of bran per cow daily, in two feeds, fed dry, and as many corn stalks as they would strip of the softer, finer parts. The ration for Lot II was the same as that of Lot I, except for the corn-stalks, mixed hay was substituted, a full supply being kept before them. After feeding carefully for a week the ration was continued and the milk and butter product saved for fourteen days. At the end of this period the hay and corn-stalks of the two rations were changed about for the two lots and the trial repeated. The two cows of each lot, therefore, were on both sides of the trial, thus eliminating largely the errors due to the difference in individuals.

Six weeks were required to complete the test with mixed hay and corn-stalks, and, this done, the whole trial was repeated except that clover hay was substituted for the mixed hay, the corn-stalk ration being continued.

The tables here given show in a condensed form the results:

FIRST TRIAL—CORNSTALKS VERSUS MIXED HAY.

Two cows in each lot; each period 14 *days.*

	Numbers of the cows of Lots I and II.	Amount of cornstalks fed.	Amount of mixed hay fed.	Refuse weighed back.	Amount of cornstalks eaten.	Amount of hay eaten.	Amount of corn meal eaten.	Amount of bran eaten.	Amount of milk given.	Amount of butter made.
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.oz.	lbs.oz.
First period, Jan. 9–25.	1&2	1186	.....	436	750	.....	140	196	640.9	29.13½
	3&4	.....	300	26½	.....	273½	140	196	480.8	28.10½
Second period, Feb, 4–18.....	1&2	.....	455	11	.....	444	140	196	583.7	27.7
	3&4	1188	.....	367½	820½	.....	140	196	480.3	27.3

SECOND TRIAL—CORNSTALKS VS. CLOVER HAY.

Two cows in each lot; each period 14 *days.*

	Number of the cows of Lots I and II.	Amount of cornstalks fed.	Amount of clover hay fed.	Refuse weighed back.	Amount of cornstalks eaten.	Amount of clover hay eaten.	Amount of corn meal eaten.	Amount of bran eaten.	Amount of milk given.	Amount of butter made.
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.oz.	dlbs.oz
First period, Feb'y 26—Mch. 11—	1&2	922½	.....	348	574½	.....	140	196	607.13	25.12
	3&4	.....	366	49½	.....	316½	140	196	497.13	25.8
Second period Mch. 19–Apr. 1.	1&2	.....	276½	19	.....	257	140	196	561.4	29.0½
	3&4	944½	.....	298½	646	.....	140	196	471.6	26.6½

Comparing cornstalks with mixed hay, when supplemented by 280 lbs. of corn meal and 392 lbs. of bran, we find —

2,374 lbs. of cornstalks yield 1,120 lbs. 12 oz. milk, making 75 lbs. 0½ oz. butter;

755 lbs. of mixed hay yield 1,063 lbs, 15 oz. milk, making 53 lbs. 1½ oz. butter;

or, 56 lbs. 13 oz. milk and 15 oz. of butter more from the stalks than from the mixed hay.

Comparing cornstalks with clover hay, as in the previous instance we find—

1,867 lbs. cornstalks yield 1,079 lbs. 3 oz. milk, making 52 lbs. 2½ oz. butter;

642½ lbs. clover hay yield 1,059 lbs. 1 oz. milk, making 54 lbs. 8½ oz. butter;

or, 20 lbs. 2 oz. more milk, and 2 lbs. 6 oz. less butter from the cornstalks than from the clover hay.

Taking into consideration the fact that the milk and butter yield are both larger from the stalks than from the mixed hay it is fair to say that the corn stalks were worth one-third as much as the mixed hay; that is, one ton of mixed hay is worth three tons of stalks fed as these were.

From the second trial we see that one ton of clover hay was worth somewhat more than three tons of cornstalks fed as described.

In the two trials 4,241 pounds of stalks were fed, and 1,450 pounds weighed back as coarse parts that the cows refused to eat. This is over 34 per cent. of the whole amount of the stalks, by weight, lost by feeding in this manner. Whether the part thus lost is proportionally as valuable as that eaten, and what amount can be saved by passing the stalks through a feed cutter is work for future experiments.

Arranging our figures in another form, we have the following:

Food required for 100 pounds of milk when feeding cornstalks;
193 pounds of cornstalks.
25 pounds of corn meal.
35 pounds of wheat bran.

Food required for 100 pounds of butter when feeding cornstalks:
3,880 pounds of cornstalks.
514 pounds of corn meal.
719 pounds of wheat bran.

Food required for 100 pounds of milk when feeding mixed hay:
71 pounds of mixed hay.
26 pounds of corn meal.
36 pounds of wheat bran.

Food required for 100 pounds of butter when feeding mixed hay:
1,348 pounds of mixed hay.
500 pounds of corn meal.
700 pounds of wheat bran.

Food required for 100 pounds of milk when feeding clover hay:
60 pounds of clover hay.
26 pounds of corn meal.
37 pounds of wheat bran.

Food required for 100 pounds of butter when feeding clover hay:
1,179 pounds of clover hay.
513 pounds of corn meal.
718 pounds of wheat bran.

From the data here given one can easily calculate the cost of food necessary to produce one hundred pounds of milk or butter. Supposing hay is worth $8 per ton, then the cornstalks would be worth $2.66, or one third the value of the hay, as shown by these experiments. Suppose further, that bran can be had for $12, and corn meal for $15 per ton. Assuming these prices we will find that the food necessary to produce one hundred pounds of milk costs, as the average of the before detailed experiments, about sixty-six cents, and the food to produce one hundred pounds of butter costs about $12.84.

In considering these experiments the reader should bear in mind that during each of the four periods lasting three weeks each, including the week of preliminary feeding, the cows were upon one variety of food, and that only. Variety in food is as essential to beast as to man, if we wish the best results, and these results may be looked upon as the lowest we should receive from these food articles, rather than average or high results. Any careful feeder of dairy cows has observed that the cow is the quickest of all animals on the farm to appreciate and respond to variety and a change of diet from time to time.

The cornstalks used in these experiments were from a plot of ground 3.27 acres in area. This corn was grown upon tile drained land that in former years had been of little value owing to crops drowning out almost every year.

The corn was of the Pride of the North variety, a small

stalked, small eared, early yellow dent corn. The 3.27 acres produced 14,684 pounds of stalks and 16,160 pounds of ears, or 4,490 pounds of stalks and 4,941 pounds of ears of corn per acre. This was 68 bushels of 72 pounds each.

With these facts and those of the experiments before us, let us attempt to estimate the butter that can be produced from an acre of corn land.

For this purpose let us assume that the 4,941 pounds of ears from an acre would make 4,000 pounds of corn meal allowing for shrinkage and grinding about twenty per cent. which is fully enough for corn as dry as this at husking.

Now most farmers would be unwilling to trade a ton of corn meal for a ton of bran, but let us substitute bran for corn meal, pound for pound in part, so as to have seven pounds of bran for each five of corn meal. The two tons of corn meal then would give us 2,334 pounds of bran and 1,666 pounds of corn meal.

By our experiments we have shown that by feeding as described, 193 pounds of cornstalks made 100 pounds of milk and for 100 pounds of butter 3,874 pounds were required; also that 25 pounds of corn meal and 35 pounds of bran were required in addition to the cornstalks for 100 pounds of milk; and 514 pounds of meal and 718 pounds of bran for 100 pounds of butter.

From this we see that an acre of land produced sufficient grain food for 6,664 pounds of milk, or 324 pounds of butter, and sufficient cornstalks for for 2,324 pounds of milk or 115 pounds of butter.

Valuing milk at $1.00 per 100 pounds and butter at 20 cents per pound (winter prices) we find that one acre of land produced sufficient corn stalks for $23.24 worth of milk, or $23.00 worth of butter, and meal sufficient for $66.64 worth of milk, or $64.88 worth of butter.

It will be noticed that about three acres of corn stalks are necessary to supplement the corn from one acre, as we fed it. Practically the farmer can grow hay in part for coarse feed, thus giving variety and maintaining the balance between crops so essential in successful farming.

During the coming winter it is designed to continue ex-

periments in this direction, using the feed cutter to reduce the corn stalks to a condition in which they can all, or nearly all, be eaten.

REPORT OF COMMITTEE ON RESOLUTIONS.

Your committee beg leave to submit the following resolutions:

Resolved, That this convention place itself on record as emphatically demanding laws, both state and national, which shall regulate the traffic in counterfeit and substitutes of dairy products; to the end that the dairymen shall have their commercial right upon the one hand and the consumer upon the other shall be protected from imposition, so that all products of the cow shall be sold upon their individual merits, and we, as a convention, call the attention of our law-makers, national and state, to this most important matter.

Resolved, That this association gives its hearty endorsement to the spirit of the bills lately introduced in congress, placing the manufacture and sale of all counterfeits of butter and cheese under the control of the United States revenue department, whereby they may be made subject to a special revenue tax, and we hereby ask our representatives in congress for their earnest co-operation in securing the final passage of a law embodying such provisions.

Resolved, By the Wisconsin Dairymen's Association, that the interest of both producers and consumers of dairy products would be best served by the stamping of cheese and butter packages with the date of manufacture and the name and address of the makers.

Resolved, That in view of the momentous fact that the dairy products of the state have reached in value to the enormous sum of $20,000,000, this association respectfully petition the next legislature for the passage of a law similar in its provisions to that enacted by the state of Minnesota, providing for the appointment of a dairy commissioner and the appropriation of a sufficient sum of money to suppress the illegal sale of all counterfeits of butter and cheese.

WHEREAS, The Illinois state board of agriculture at its late fat stock and dairy show in Chicago, invited the dairymen of this state and the northwest to make a competitive exhibit of butter, cheese, and dairy cattle, and by their subsequent truckling to the butter counterfeiter's interests showed plainly that they cannot be counted as friends of the dairy interest, therefore

Resolved, That in the opinion of this association no self-respecting dairyman can afford to be again caught in such company, as it might be rightly inferred that we were birds of like feather.

Resolved, By the Wisconsin Dairymen's Association, that the railroad companies of this state in granting reduced rates upon their roads to all in attendance upon the sessions of this association, have manifested an intelligent sympathy with the producing interests of the commonwealth, and are entitled to our sincere thanks, which are hereby extended,

Resolved, That in the broad, generous and intelligent hospitality extended to this association by the people of Richland Center and Richland county there has been a most complete recognition of that friendly and divine sentiment, that it is more blessed to give than to receive, and that we shall recollect with special pleasure the gentlemen who have so liberally contributed their time and their money, and the ladies who have rendered our stay in this community so delightful by their tact, their grace and thoughtful care.

Resolved, That as dairymen believing in the special mission of the dairy cow, we have lost confidence completely in the friendliness of the Illinois State Board of Agriculture towards this mission and the vast interest which rests upon it. We believe the time has come for the organization of a permanent dairy and dairy stock show in the northwest at some available point, and the secretary of this association is requested to forward copies of this resolution to all dairy associations in the United States and Canada, and invite their co-operation to this end.

Resolved, That the thanks of this association are hereby tendered to its officials for their wise administration of its affairs during the past year.

Resolved, That the secretary of the association is hereby instructed to prepare suitable blanks for petitions to congress for the passage of a law in conformity to preceding resolutions and forward the same to every creamery and cheese factory in the state, with request to secure signatures of their patrons to the same and to be returned to the secretary and by him forwarded to the several members of congress from our state.

W. D. HOARD,
JOHN GOULD,
H. C. ADAMS,
Committee.

Resolution unanimously adopted.

A committee consisting of W. D. Hoard, Fort Atkinson, D. W. Curtis, Fort Atkinson, N. L. James, Richland Center, H. C. Adams, Madison, were appointed to carry out the indicated in the resolutions relative to a permanent Dairy and Dairy Stock Show in the Northwest.

HOW SHALL WE IMPROVE WISCONSIN CHEESE ?

A. J. DECKER, Fond du Lac.

If we note carefully the condition under which the cheese in Wisconsin is now made we may suggest some improvements.

"The system almost universally practiced in Wisconsin in cheese factories is to make the cheese on a co-operative plan. The factory doing the work of making the cheese and furnishing the materials of manufacture for a given sum per pound. Usually one and one-half cents per pound. The cheese maker agrees to warrant his cheese to bring the ruling price. The patrons who furnish the milk receive credit for the number of pounds of milk they deliver with little reference to quality and receive the returns from the cheese in proportion to the amount of milk furnished. If the cheese maker suggests to a patron that his milk lacks strength or quality, the answer usually is, "If you do not like it I will go to the next factory or I will build a factory myself. Add to this the idea held by some patrons that the cheese factories are making the largest share of profits. Factories in many localities have become so numerous that they have become weak. The small amount of milk received at each factory compels retrenchment in expenditures and a low-priced cheese maker; cheaper materials used in cheese making are tried. The old vat that has been patched and mended until it has become a stink pot to contaminate every batch of milk that is put into it, because the factory has not made enough to buy a new one.

This same influence applies to the patrons and their old cans. I have been at factories when the milk has been taken in and often one-half of the cans in which milk is brought, should never receive a batch of milk again.

These patched cans when the milk is empted are filled with sour whey, and taken home and often remains in the cans during the entire day, and at milking time is empted and rinsed out with cold water and the warm milk turned

in. This is I think the general practice, and the result is, tainted milk, when the first requisite of good cheese is good milk. Another practice is, commencing to bring milk when they get a good ready in the spring and quitting in the fall by the same standard without notice or consideration of the factory's interests. In this a grand mistake is made for the success of the patron is based on the success of the factory. The patrons should feel that the factory is theirs and to make it give them good returns they must give it good healthy support in quantity and quality of milk.

Patrons, watering and skimming milk is a willful practice that depreciates the quality of Wisconsin cheese to a large per cent.

One of our factories in Fond du Lac county that was receiving 3,800 pounds of milk, detected a patron skimming the milk he brought to the factory. The next morning the cheese maker told each patron as he delivered his milk, that a skimmer had been detected and he was going to be exposed and prosecuted, but did not tell who it was. The next day, the cheese product was fifty pounds more than on previous days, although the amount of milk was not any greater.

The solution to this problem was very plain. It showed that skimming or watering had been a regular custom to the amount of twelve per cent. of the cheese product of the factory, which was shown by the abrupt stop put to the practice by fear of detection.

Many factory men know that this state of things exist, but say that if you go to rooting round to find these fellows you will loose their patronage, and the factory can hardly live as it is, and besides the law is so complex and uncertain that the chances of correction are slim. These things exist, but what are you going to do about it?

The subject of this short paper is to answer that question.

The question of producing rich milk by good rich food, and good rich milk producing cows is but a question of time, and is being pushed to a higher standard by the leading farmers and dairymen, led by the agricultural and dairy organizations of the state.

To keep the milk pure until it is delivered at the factory, a system of paying according to its cheese value and not by the weight of the full bulk delivered, must be adopted. It has been plainly shown that different cows vary forty per cent. in the richness of their milk, and the amount and quality of cheese it will make.

One patron may furnish one hundred pounds of milk that will make twelve pounds of cheese; another patron furnish one hundred pounds of milk that will make but eight pounds of cheese, and both receive the same amount of money.

One man looses two pounds of cheese, while the other gets pay for two pounds that he did not deliver. While if the system of paying according to the cheese value, each would have received pay for exactly what he had delivered.

Another man adds ten per cent. of water to his can and gets paid for the water according to the present system. But if he received pay according to the cheese value, his watering or skimming would injure none but himself. This system would not only correct the injustice of scaling down good milk to make up the deficiency of poor milk, but would effectually prevent watering or skimming, and thereby give Wisconsin a richer, purer milk, from which to make cheese, than we have had before.

The great Ailesburry company, of London, who furnish great quantities of milk, test their milk with alcohol and ether which separates the solids from the water, and the percentage of each is shown in fifteen minutes. A company in Saint Louis, is making a similar test with similar results. I had hoped to be able to learn the exact formula before the time of this meeting, so I might be able to make practical tests here. But I have been able to make certain results plain by simply coagulating the milk and filtering, which gave the range of difference in quality referred to. The question may be raised that the average cheese-maker will not be competent to make these tests of figures the proper percentage for his dividends. But the cheese-maker that is not competent and will not learn to come up to the highest point of the profession should be dropped and never reinstated unless he advanced with his business. By sifting out

indolent and ignorant cheese-makers it will improve *Wisconsin cheese.* The system of paying for making the cheese is one-sided and defective. It matters not whether cheese is five or ten cents in the market the making is the same.

The interests of the patron and factoryman should be alike in producing the best results and both showing in the profit or loss. As it is there is often an antagonistic feeling and interest between the factoryman and patron. The factoryman works for his regular price per pound and feels perfectly safe, while the patron feels if the price is running below the cost of produce it invites watering, skimming or any fraud that may appear likely to make his loss good. Often lack of care in milk will send poor milk to the factory. The cheese-maker does not detect it in time, and a sour, bad flavored batch of cheese is the result. The cheese-maker, not feeling that he was to blame keeps the bad flavored cheese out of sight in boxes or elsewhere when the buyers comes to inspect them. But when the shipment is made, they are substituted for an equal number of those accepted, and the fraud is not detected until after the cheese have been delivered and paid for. This creates a question of fraud between buyer and salesman, and the factory suffers in reputation.

Establish a system of dividends based on the price received and make the cheese maker a salesman, and you will make a co-equal interest in quality that will raise the standard of Wisconsin cheese.

There are too many small weak factories whose profits will not pay a good intelligent cheese maker and boys of a few weeks' practice with small pay is considered all they can afford. The boys work to a disadvantage by having not milk enough to work to advantage.

The buyers, as a rule, avoid the small factories, and the cheese is often left on the shelves until past the proper season, and an uneven lot is the result and the lowering the average of the state product is the result.

Establish a standard of skill in manipulating. A knowledge of the elementary principles of chemistry sufficient to

know, when, how, and where, the chemical changes take place in the formation of the cheese.

HOW TO CARE FOR AND CURE CHEESE PROPERLY.

Have a state superintendent that would visit the factories and examine into the cheese maker's qualifications, and give or hold certificate as the case may require, give directions as to the proper methods of operating, and after the first year no cheese maker would be qualified to accept any position without the certificate of the superintendent. This will raise the standard of Wisconsin cheese.

The question of expense of an instructor, and the arbitrary rule of compelling the cheese maker to leave his business is brought in question.

But careful thought shows that the opposition to this plan is penny wise and pound foolish. We felt keenly the fact for several years past that Canada was selling her cheese product at a cent in advance of what we were selling ours, after Mr. Harris had spent several seasons instructing their cheese makers. Add one-half cent to the product of Wisconsin cheese, and you would pay the salary of a competent superintendent, and leave a handsome sum of profits in your treasury.

In times of depression in business, profits lie only on the highest points of success, and manufacture must reach high to get them.

The Wisconsin State Dairymen's Association has raised Wisconsin dairying from a low disgraceful grade to respectability. But more work is yet to be done, and I fairly believe that in the near future the clear-headed dairyman of Wisconsin will adopt measures in substance of the suggestions in this paper and Wisconsin cheese will stand preeminently the model of elegant perfection and bring the prices that such goods merit. And any factory man that does not push ahead with the tide of advancement, must keep in the old rut and continue to take the same old scrub price for his goods.

DISCUSSION.

Question — I would like to know a little further about the employment of women in the cheese factory. Can a woman manage a cheese factory without any men to help do the lifting and attend to the pressing of the curd?

Answer —They do do it, and yet it is generally pretty hard; harder than I should want a woman to do. Yet, if you have got to have two in the factory, have the woman always first and a man to help under her direction.

Question — Isn't that a little woman's rights?

Answer — I believe that woman should have every right that is given to a man, no matter what it is. They are better than men, or else let the men come up to the standard of the women, and we would have a better government to-day.

Question —What wages can a woman get at the head of a cheese factory? What are they getting now in your county?

She ought to get precisely what any competent man can in the same position, and a woman that could not earn just as much for the same work as a man, I wouldn't have in the factory. They are actually getting about $40 a month, and cheese makers who perform the same service are paid $50, $55 and $60. That is $40 and board in most cases.

Question — Have you tried these experiments you spoke of, with two or three samples of the same milk to start with?

Answer — I have not.

Prof. Henry — In all chemical work, Dr. Armsby always starts with two samples, and if he doesn't come out within two-tenths of each other, he says "my work is worth nothing." I would suggest, if you were testing, that it would be better to compare two samples nearer together.

Answer — My experiments were crude, but it merely showed a point to start from.

Prof. Arnold — I have been over that ground very carefully, and made the tests just as accurately as I possibly could, and repeated them, and I found that in making the

tests without evaporation there is no reliance to be placed upon the results; you would be surprised at the wide differences it would lead to, in the little amount of moisture that would be left in one sample more than another. It looked so reasonable that I took the same view of it exactly that Mr. Decker does, but when I came to work at it practically, I found it impossible. I sometimes got ten per cent. out of the way, would find ten pounds in a hundred difference.

Mr. Decker — One reason that led me to make these experiments was that there is a company in London that make their tests in that manner; they determine the amount of solids in fifteen minutes. In St. Louis there is a company following the same methods. I thought I was closer than five per cent., at any rate I reached the conclusion that I thought was practically correct.

Prof. Arnold — I would like to speak about the combination or connection of different factories such as was suggested. This subject was studied over in Canada, and being somewhat under government control, they could operate a little more efficiently then they could otherwise. They have a fund from the government, and the proposition was, at their last convention, to employ a superintendent for, say twenty factories, let him be a competent maker, and let him dictate how the cheese shall be made in all the factories over which he presides. They propose to empower him to look after the milk through the agency of the several cheese makers; also as to the rejection of poor milk, and other questions that may come up, and he will be assisted by the cheese makers. If, in one out of twenty factories he finds a good one, he can explain his ideas, and he will tell the rest, and in that way they will make good work of it. The plan looks very feasible if you have a fund at command, or if the cheese makers themselves will bind together, and pay such a man, they will find that the improvement in the making of the cheese will pay his salary ten times over. It is like a school system, and I would not allow any cheese maker to make cheese that could not get a certificate of his ability to perform his duties, after the first year, and he must be in a position where he can say, "I am ready to warrant all the

cheese I will make, if I have the privilege of sending home all the milk that I don't want."

Mr. Beckwith — I want to say about the Stowell's evergreen corn. I used ensilage corn for two years. It was planted on a field that had been a pasture. It had manure very thick over the whole field, so that the ploughshare cut through and turned it under. I put this corn in with a corn planter. I wanted a large yield of stalks that year, and I got a tremendous crop. I had enough on that field to feed into April. I did not take it out of the field. I tied it up in large bunches, and set it up nicely, and my corn was nice and green in the winter. I had forty tons per acre of this ensilage corn, and consider we were raising double the quantity of ensilage that we got of the Stowell's evergreen. I have not a silo, but, as soon as I am able, I shall get one. I like the Stowell's evergreen in the fall of the year when you can feed right along, but after that I prefer ensilage or fodder corn.

REPORT OF COMMITTEE ON DAIRY PRODUCTS.

Your committee to whom was assigned the duty of judging the butter and cheese, beg leave to submit the following report:

Each one of the judges worked separate from the other, and held no consultation whatever until the work was completed.

CLASS I.—*Premiums on Butter.*

C. F. Fargo, Lake Mills, first premium	$10 00
Harris Bros., Spring Prairie, second premium	5 00

CLASS II.—*Print Butter.*

Mrs. E. S. Robertson, Viroqua, first premium	$5 00
Mrs. Adell M. Bragg, Viola, second premium	3 00

CLASS III.—*Granulated Butter.*

N. L. James, Richland Center, first premium	$3 00
C. F. Fargo, Lake Mills, second premium	2 00

CLASS IV.—*Chedder Cheese.*

Excelsior Factory, Sheboygan Co., first premium	$10 00
Harris Bros., Spring Prairie, second premium	5 00

CLASS V.—*Hart Silver Cup.*

T. P. Fish, Richland Center.

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, Centerville, 1882; Marr & Dyer, Whitewater, 1883; E. P. Ingalls, Milford, 1884; H. Z. Fish, Richland Center, 1885 and T. P. Fish, Richland Center, 1886.

Respectfully submitted,

C. F. DEXTER,
W. H. HINTZ,
CHESTER HAZEN,
Committee.

Report on motion was adopted.

TABLE SHOWING THE ENTRIES OF CHEESE IN CLASS IV, AND THE AWARD OF THE JUDGES.

NAME OF EXHIBITOR.	Flavor 30.	Quality 30.	Texture 20.	Salting 10.	Color 10.	Total 100.	Grand total.	Judgment average.
Warren Kimball....	27	29	18	10	10	94		
	20	25	15	10	10	80	247	
	20	23	10	10	10	73		82⅓
H. Z. Fish.....	27	28	18	10	10	93		
	20	28	20	10	10	88	272	
	25	28	18	10	10	91		90⅔
T. P. Fish.....	25	28	19	10	10	92		
	20	30	20	10	10	90	268	
	22	27	17	10	10	86		89⅓
F. E. Carswell.....	28	29	20	10	10	97		
	20	20	20	10	10	80	265	
	27	27	14	10	10	88		88⅓
Harris Bros.....	27	28	19	10	10	94		
	27	25	20	10	10	92	274	
	25	27	16	10	10	88		91⅓
Canada cheese, colored.....	27	27	18	10	10	92		
	28	30	20	10	10	98	274	
	23	25	16	10	10	84		91⅓
Canada cheese, white	26	29	18	10	10	92		
	28	26	20	10	10	94	272	
	25	24	17	10	10	86		90⅔
New York cheese...	27	28	19	10	10	94		
	30	28	20	10	10	98	275	
	23	25	15	10	10	83		91⅔
Excelsior Factory, Sheboygan Co.....	26	28	19	10	10	93		
	28	28	20	10	10	96	277	
	26	26	16	10	10	88		92⅓
H. K. Loomis.....	26	28	19	10	10	93		
	25	25	20	10	10	90	269	
	25	26	15	10	10	86		89⅔

TABLE SHOWING THE ENTRIES OF BUTTER IN CLASS 1, AND THE AWARD OF THE JUDGES ON A SCALE OF 100 OR PERFECTION.

NAME OF EXHIBITOR.	Flavor 40.	Grain 30.	Salting 10.	Color 15.	Style of package 5.	Total 100.	Grand total.	Average judgment.
C. B. Keys	37	27	10	15	5	94		
	25	25	10	7	5	72	251	
	33	24	10	13	5	85		83⅓
C. F. Fargo	37	29	10	15	5	96		
	35	25	10	12	5	87	274	
	35	27	10	14	5	91		91⅓
Mrs. W. E. Bush	35	27	10	15	5	92		
	25	30	10	15	5	75	251	
	32	25	10	12	5	84		83⅓
N. L. James	34	28	10	15	5	92		
	15	20	5	0	5	45	217	
	30	25	10	10	5	80		72⅓
F. E. Carswell	36	29	10	15	5	95		
	15	15	8	5	5	48	233	
	34	28	10	13	5	90		77⅔
Hiram Smith	35	27	10	12	5	89		
	25	20	10	5	5	65	240	
	32	27	10	12	5	86		80
Harris Bros.	34	26	10	15	5	90		
	35	25	10	15	5	90	267	
	34	26	10	12	5	87		89
J. M. Thomas	37	28	10	15	5	95		
	25	15	7	15	5	67	246	
	32	24	10	13	5	84		82

NOTE — The judges were C. F. Dexter, Chicago; W. H. Hintz, Elgin, Ill.; Chester Hazen, Brandon, Wis.; and their markings are in the order named. To get the average judgment the grand total is divided by 3, the number of judges.

TABLE SHOWING THE ENTRIES OF CHEESE IN CLASS V. FOR THE HART SILVER CUP AND THE AWARD OF THE JUDGES.

NAME OF EXHIBITOR.	Flavor 30.	Quality 30.	Texture 20.	Salting 10.	Color 10.	Total 100.	Grand total.	Average judgment.
H. Z. Fish	27	27	18	10	10	92	278	
	28	26	20	10	10	92		
	25	28	19	10	10	92		92⅔
T. P. Fish	27	28	19	10	10	94	280	
	28	27	20	10	10	95		
	25	28	18	10	10	91		93⅓
F. E. Carswell	26	28	17	10	10	91	261	
	20	23	20	10	10	83		
	23	27	17	10	10	87		87
Harris Bros	28	29	19	10	10	96	276	
	27	25	20	10	10	92		
	24	28	16	10	10	88		92

The judges in cheese were C. F. Dexter, Chicago, for many years a commission man in butter and cheese, and judge in cheese at the World's Exposition at New Orleans; H. W. Hintz, dealer in butter and cheese, Elgin, Ill., and Hon. Chester Hazen, of Brandon, Wis., who is one of the largest cheese manufacturers in the state, also dealer in cheese. Their markings are put down in the order in which they are named.

In class 4 it will be seen that there are two Canada cheese and one New York cheese.

The executive committee instructed the secretary to purchase these cheese to compare them with Wisconsin cheese. C. E. Casswell, of Ingersol, Ontario, Canada, a cheese dealer, purchased the two Canada cheese from their best average factories. Messrs. Robert McAdam & Son, of New York City, cheese dealers, purchased the New York cheese marked with the state brand of New York. Will C. Davis, of Sheboygan, Wis., a cheese dealer, purchased a Wisconsin cheese made at the Excelsior factory in Sheboygan county.

All of the cheese in class 4 were numbered, and all brands and marks removed. The judges did not know who their associates were until the judging was completed.

The noted cheese maker, J. B. Harris, of Antwerp, N. Y., was asked to judge the cheese and kindly consented to do so.

He set out a table across the room facing in an opposite direction from the cheese, and samples were carried to him on a fryer, each sample being numbered to correspond with the cheese. In almost every instance his markings corresponded with those of the judges.

He placed the first and second premiums exactly where the judges did, but on Canada cheese he marked a little higher. The executive committee desired to get at the relative merits of the different cheese as near as it was possible, in an impartial manner.

REPORT OF COMMITTEE ON DAIRY GOODS AND MANUFACTURES.

Mr. President—Your committee beg leave to submit the following report on dairy goods:

The old standard rectangular churns, represented by Cornish, Curtis and Green, have been so long in use their merits are well known, and the committee cheerfully recommend them to all who are in need of churns.

The firm also have a large exhibit of butter workers and all tools necessary for the manufacture of fine butter.

Haney & Campbell, Bellone, Iowa, have on exhibition Jacked carrying cans and refrigerator tank for carrying cream. They also have a good assortment of dairy supplies.

F. D. Fargo Co., Lake Mills, have on hand butter coloring; also fine cream carrying tank and parchment paper for covering butter. Such articles we consider worthy of trial by those in need of them.

The patent test churn exhibited by Andrews & Burnap, Dubuque, Iowa, in the opinion of the committee, is the best machine for ascertaining the true butter value of milk or cream yet in use so far as we know.

The Cooley creamer, manufactured by John Boyd, Chicago, acknowledged to be the standard of the submerged system, is so widely known it needs no recommend by the committee.

Samuel B. Davis & Co., Chicago, have on exhibition a sample of their

celebrated rennetine and cheese grease which the committee consider worthy of trial by all manufacturers of cheese.

The Danish Western Cream Separator, which in the opinion of the committee should be examined and tried by all creamery men wishing a centrifugal separator.

Chris. Hansen's laboratory have on exhibit samples of their world-wide known butter and cheese color and rennet extract, which need no recommend by the committee, and should be tried by all factory men.

STEPHEN FAVILL,
H. Z. FISH,
CHESTER HAZEN.

The convention adjourned to meet at seven o'clock P. M., January 28, 1886.

EVENING SESSION.

The convention met pursuant to adjournment at seven o'clock P. M., Ex-President Favill in the chair.

ODDS AND ENDS IN DAIRYING.

By J. M. THOMAS, Dixon.

It is an old adage that life is made up of small things. It is the odd moments of life improved that count. If the odds and ends of business are kept well in hand it is a prime element of success. No matter how well the general plans of an individual may be laid, an inattention to details will result in failure. In these days of sharp rivalry, of active competition, it is the small things, the odds and ends that frequently make the margin upon which depends profit or loss, success or failure. This is applicable in a greater or less degree to all kinds of business, but to none more particularly than to dairying in all its branches. From beginning to end, from the time the cow is placed upon the farm, until the butter is packed in the tub or the cheese boxed, it is a question of constant attention to details, and if these are not well attended to the odds are that the end will be a failure. An indispensable method of keeping the details well in hand, and keeping track of the odds and ends is to keep a strict account of all items of receipts and expendi-

tures. This done and intelligently studied will show a person many ways of improving his business which he would not otherwise have thought of. I do not believe there is one dairyman in ten that at the end of the year can give anything more than an approximate guess as to either receipts or experditures. And there is no business but farming that could be conducted at all in any such slip shod manner.

I shall take time to enumerate but a few odd points that seem to me of essential importance. For instance the cow is the machine the dairyman depends upon to change the food he shall give her into milk. She requires a certain amount of this food to sustain life, this she appropriates at first. If she gets no more than this the dairyman gets no milk. It is the surplus, the odd amount above what is required to sustain life from which he obtains his profits, and the greater the surplus the greater the profit. In fact, after the expense of keeping the cow is paid, each odd pound of milk he can obtain is clear profit. You often in the fall hear such remarks as this, how happens it Mr. A that for the past few days you have been getting so much more milk than you did? Oh, says A, I have just got my cows in the after feed or the corn stalks. Now would it not be a healthy idea for A to take that odd piece of meadow or pasture that yields only a little grass, fertilize it thoroughly, sow it to sweet corn, and give his cows something they can make milk of; then they would not get run down so that a few odd frost bitten dried up corn stalks would create such a magical change. Again, this machine, the cow, is a decidedly sensitive machine to a good or bad treatment. An odd blow with the milking stool may not only lessen the quantity but hurt the quality of the milk she will give. She cannot be kept in prime order as a milk-producing machine without kind treatment and care for her comfort. If she is left out doors with the mercury below zero, or standing in the barn with the window light out and the wind whistling through the cracks, she may do after awhile to work into oleomargerine, but she never will be a

profitable machine for the manufacture of creamery butter no matter what breed she is.

This point of caring for the comfort of the cow, of keeping her well and at all times treating her well, is a most important point and cannot be too deeply impressed upon every person having charge of her. Taken as a whole, it is by no means a small matter, but it involves the necessity of daily attention to small matters. And the essential point is, not that we learn to do this or that particular thing, but that we become fully convinced that the quieter and more comfortable we can keep the cow the greater will be our profits, and that we act upon this belief intelligently.

I have seen a herd of milch cows driven from the pasture by a man on a galloping horse on one wing and a yelping dog on the other. Now everything in this world has its compensation, and cows treated in any such manner will assuredly repay their owner. I have always thought that the benefits derived from these associations were not so much in the particular things we learn as in the stimulus to thought the suggestions we get that lead us to investigate for ourselves.

DAIRYING IN HARD TIMES.

By JOHN GOULD, Aurora, Ohio.

It is not to be expected in an address of one thousand words that one can more than briefly point out a few of the reasons why the times are hard in dairying. Why they are close and unsatisfactory is not my purpose to discuss, so much as to indicate the best I can how they may be escaped from, and bring success when defeat, now to so many, seems certain. That some dairymen are now succeeding, even under discouragements that seem insurmountable to others, is a gleam of hope, that the great mass of dairymen could do far better than they now do, if they would put brains, method and forecast into their business. In enumerating some of the methods that may aid us in dairying at a profit, even in hard times, we first remark, better knowledge of the busi-

ness. Two-thirds of the dairymen in the North to-day, are engaged in it simply from the fact that some one else went into the business and succeeded, and they followed suit without making a close calculation of not only their own ability to succeed as dairymen, but of the adaptation of their farms, and all that goes to make up successful dairying, and after applying the business principles of supply and demand to the matter in hand, accept the balance either for or against and abide the the result. The dairyman to carry his business in hard times must be, not only in love with his vocation, but also be able to analyze the elements that assist in making that business a success, and accept or reject those not favorable towards contributing to the desired end.

Success in dairying must in the future be a studied attempt to attain success, not the trusting to luck to pull one through. It must be controlling circumstances as far as possible, rather than allowing circumstances to control the dairy.

The farm must be a natural dairy farm, or so adapted that it can, without great expense or continued outlays, be made to conform to the requirements of the case. It needs soil on which the best and most nutritious grasses find their essentials of growth. It must have good and abundant water, and where it is wanted, and it must be a farm that has facilities for drainage, for low lands furnish washy and often sour feed, and is usually a soil unless drained, that parches and burns in a drouth. This farm must have well built stables and adapted to the wants of the dairy. Stables are built for dairies, not dairies for stables, and nothing contributes more towards successful dairying than a well appointed stable, contributing towards the comfort of the animals, but also an economizer of food, two elements that go far towards success in dairying, especially if the cows are kept in these warm stables twenty-three out of twenty-four hours in cold weather.

Better cows are demanded, and cows adapted for the wants of the market to which they contribute. The dairy has now three principal avenues of income to the farmer, cows for butter, cows for general factory, and cows for

the city milk supply, and for these, three specially bred cows are needed, and I think it will be found that the general purpose cow, can only be used to advantage to supply some demand outside of these three enumerated essentials. This want, I think, can best be filled by the home bred dairy, that has been shaped by the controlling mind of the farmer. The dairy has no further use for the nondescript brindle cow. She was patented for cheap lands and high prices. Better bred cows means cows producing more milk for the food consumed, for a cow especially bred would transform food into milk, and the other either improperly assimulates her food, or else transforms it into flesh. The well bred dairy has an income from the sale of fine stock that is not possessed by the ordinary dairy. A valuable cow bred to a valuable bull, nine times out of ten brings a valuable calf. Purchased cows from unknown sources in the future, will be a source of loss in dairying. The home raised heifer, should she fail, can be sold at a price about her actual cost, but when the purchased cow fails there is a sacrifice in dollars, that the others must make good to the farmer.

The dairy farm should be as nearly as possible self-supporting. It should be made to grow the supplies needed by the dairy, and the only exception I would make — accidents and drouths excepted — would be in the purchase of bran as an agent in contributing to the manure supply of the farm, and more perfectly balancing the food ration. The farm should be made to furnish its own hay and grain, and thus furnish a ration that has been produced at the cost of labor only. The dairy which could support itself on a purchased ration would, if fed a home-grown food yield a most gratifying profit to the owner. Purchased grains are usually supplied to the dairyman at a price guaged by all the "traffic will bear." It is a problem of cheap food, more than a question of a return to high prices that will determine largely the matter of successful dairying in hard times. We have this silo problem to look square in the face, and ask if these abundantly grown foods, cheaply gathered, and well preserved, succulent in character, making summer in the winter to those who have warm stables, are not one of the

answers to future profitable dairying. Better feeding, more and cheaper food means cattle in the barn, more hours and more months as well as more stock, and this answers the demand for more fertility. More fertility means more and better crops, more grain, and combined, they imply, more profit. The cows must be made to give milk more months. Even if only 60 days was added to the milking season of a cow and this 60 days was only to add $10 to each cow's annual income, an item of profit would be added that would go very far in making dairying profitable.

Dairying to be more profitable must include how, when and where. How to manufacture. The idea of co-operation will have to be made most conspicuous; there must by some means, be a raising of the general excellence of quality. Can the general dairymen continue to make butter-making profitable by continuing the individual practices. By co-operation, we reduce the cost of manufacture to its lowest limit. By co-operation the farmer can mass his product and sell it at the best advantage. If he makes his own butter he must sell it to private customers to realize the best returns for his product, for it will if sold in the general market, only bring the average price which is largely controlled by the sales of the poor butter.

Winter or continuous dairying must also be made conspicuous so that the prices for produce may meet a higher average by the influence of winter prices. Winter prices by the very nature of things must be far higher than in summer. Now why should not the dairyman take advantage of this fact and make his dairy pay at a time when their cost of keeping is the greatest. Now if this can be reversed to a certain extent, and the unprofitable period of keeping cows transferred to a season when grass is abundant and prices are low, then I think a most substantial gain will have been made. Of course this would bring down the price of winter butter to some extent, but summer butter would bear a better price as there would be less of it than now. Its quality would be better, and there would be less competition with bogus butter, which would be to the dairyman's advantage. The taste of the consumer is becoming more educated

towards fine butter, and a fresh made article, rosy and with delicate aroma must sell, and this is a direction towards profitable dairying.

There must be more co-operative selling. The dairyman must place himself nearer the consumer, and thus lend an additional guarantee to the consumer as to the quality and character of the goods. As it now stands every chance for fraud exists. If the patrons of a large creamery or fine creameries were to place that butter in the market, sold from their own store room to the city retailer or consumer, they could inspire confidence that they were dealing in a genuine fresh article, and instead of imposing upon that confidence, foster it and try to please; an avenue of profit could be opened up that would do much to settle the inroads of bogus butter, and it would be one upon which they could not encroach. This could also be extended to the cheese trade. I fully appreciate the work of the great cheese merchants, but the dairyman has his own affairs to first direct and to his own advantage, and on co-operation he finds his greatest advantage.

Dairying to be profitable in hard times must also pay strict attention to butter making, but cheese making and especially the curing of cheese for the market must be made a matter of systematic study, and instead of filling the market with a dish of immature curd, just entered upon its first stages of curing, hold that cheese until it possesses the qualities of cheese and is fit for human consumption. If our cheese-makers cannot make a cheese that will keep until it is cured, then let our dairymen pay such a price for making that shall secure the best cheese makers, and pay them so well that they shall adopt cheese making as a profession, and who shall take pride in the fact that they are skilled workmen, and not hold only to cheese-making until something better offers. The plan must be abandoned of employing the boy who drove a milk wagon this year to make our cheese next season. We must have better curing houses and apparatus for cheese making, and when we make a high average quality of cheese, it will all be eaten

at home, and we shall not watch the cable quotations, but the Wisconsin quotations.

Of legal means to protect the dairymen I have but little to say. This convention has outlined in spirited resolutions its line of policy, and that is for speedy consignment of bogus butter to the internal revenue of the United States government. The great purpose of the dairymen as also indicated by your president's address, is to make as speedy as possible a wide line of *legal* distinction between genuine and spurious or imitation butter, and compel the latter to be sold upon its merits, and at its commercial value. Beyond this point, whether reached by state or national enactment, is a speculation point, which can only be decided as it is reached, and circumstances direct. Dairying in hard times calls for the solving of this problem of bogus butter selling, and that it will be solved, I have but little doubt, but that it will be so legislated upon, as to meet with the extreme views of those who could only see the whole "wiped from off the face of the earth," is to be hardly expected; and I do not think it is wholly desirable; for in this whole business there is an opportunity for the dairyman to rise above the present level of average, and ordinary production, and meet the consumer with an article of dairy product, that shall largely fill the requirements of the market for a better article, and in so much, settle for itself the question of choosing between a fine, high quality of dairy product, or an article of questionable quality, produced in a questionable way, and placed upon the market in a yet more questionable manner.

In these few, brief thoughts, I trust I have outlined some of the matters which must be met in successful dairying in hard times, the dairyman must depend upon himself for more, must in some way get nearer his customers, and cheapen the production at every point, while on the other hand, he raises the quality; then if he keeps aloof of the advice of the state board of agriculture of Illinois, and pins his faith to the idea that ultimate dairying will be profitable if rightfully conducted, I have but little doubt we shall very soon escape from the bondage of "Dairying in Hard Times."

THE JERSEY COW—MULTUM IN PARVO.

By T. A. LLOYD, of Indianapolis, Ind.

During the progress of this meeting we have learned much concerning the management of the cow in the dairy, how to handle the product for butter and for cheese, and it is only fitting that we should for a few moments consider the cow herself, the source from which to obtain the milk that is good, is health and wealth to this great dairying state.

In accordance with the matter given in my announcement, without disparagement to any breed, it shall be my endeavor to present to you the Jersey cow as the true dairy cow—the cow "par excellent," best adapted to the production of milk of superior quality. A milk equally rich in the necessary elements from which to manufacture a superior cheese or containing beyond dispute all that is required to produce butter in marvellous quantities and of a quality unsurpassed. She is small, but her returns for the food consumed is large; yea, the "multum in parvo" in truth. Do they tell you she is a small milker? Then we will point you to Hazen's Bess, that gave 344 lbs. 13½ oz. of milk in 7 days, an average of 49 lbs. 8 oz. per day, and in the following week gave 62 lbs. per day. Ida, of St. Lambert, yields 67 lbs. of milk in one day, and for 31 days yielded 1,888 lbs. Matilda 4th, for the month of January, gave 1,314 lbs., and for the ten months ending February 1st, gave 13,711 lbs. of milk. A herd at Passaic Bridge, Conn., averages 6,254 lbs. in a year. These are a few out of many that may be cited whose annual milk yield will rank fairly with that of any breed in the land, and when we consider the quality, stands unexcelled.

Princess 2d under an official test produces 46 pounds, 12½ ounces of butter in 7 days; Oxford Kate, 39 pounds, 12 ounces; Mary Anne of St. Lambert, 36 pounds, 12¼ ounces; Ida of St. Lambert, 30 pounds, 2½ ounces; Value 2d, 25 pounds, 2 ounces; and Hazen's Bess, 24 pounds, 11 ounces. There are now over 1,000 cows with tests ranging from 14 to 20 pounds of butter in 7 days, and many with yearly tests to prove their staying qualities. We may cite the recent test

of Landseer's Fancy, of 936 pounds, 14¾ ounces; Mary Anne of St. Lambert, 867 pounds, 14½ ounces; Jersey Queen of Barnet, 851 pounds, 1 ounce; Eurotus, 778 pounds, 1 ounce; Pansy, 574 pounds, 1 ounce. Masence, from frequent tests and an accurate record of her milk yield, was rated at 502 pounds for one year. Quite a number have exceeded 500 pounds, and the herd of ten cows at Houghton Farm, New York, averaged 398 pounds of butter for one year.

These are sufficient to attest the quality of the cow that will in the near future revolutionize the dairy. Her persistence at the pail makes her the year around cow, and makes winter dairying not only possible but profitable, giving the largest product from the least consumption of food. She will prove the most profitable because she may be depended upon to reproduce dairy cows, having been tried for this purpose for 200 years. The dairy qualities are fixed in her and will be transmitted to her descendants.

The bull used in a dairy herd is of the utmost importance, while the cows produce but one calf annually, every calf may represent 50 per cent. of his blood, therefore he should come of an ancestry of known butter qualities, particularly should his dam and his sire's dam be cows of the highest dairy type, abundant and rich milkers, capacious udders and teats, and well apart. He should be pure bred. With a vigorous constitution, and masculine without coarseness, a soft unctious hide, not too thin; fine limbs and short; a body long, deep and well flanked down; rudimentary teats should be prominent and well apart; the eye full, bright and placid; the inner surface of the ears yellow, indicating richness, also base of the horns which may be strong but not coarse. Such sire with such an ancestry may be depended upon to produce dairy cows that will increase the average yield of dairy herds to the highest possible standard of profit.

DISCUSSION.

Prof. Henry — In regard to these large tests, I know how they strike a person who has not seen anything of the kind. At the Experimental Farm last year, we had a cow that

made 465 pounds of butter in five months, upon very plain feed. I believe that the average farmer, with the average cow, knows no more about a good butter yield than we know about the interior of Africa as a community. You may say that is uncomplimentary. It may be uncomplimentary that we don't know anything more about Africa. I have upon the Experimental Farm several cows that have tested fourteen pounds a week upon common feed. We can grade up our cows, but you must never make the mistake of using a grade animal as the head of the herd. You have a cow which you think is very choice and you want to save her as a breeder, and you wouldn't take fifty, seventy or a hundred dollars, but you must not fail to remember that the male is half the herd, and you had better sell half your cows and get a good male than keep all of them. Farmers say "I will buy a half blood." That is all right for milk and butter, but it don't do for breeding. There isn't a farmer but can go out and buy a pure blood male at from $50 to $100 that will at once begin to make his herd work to a uniformity, and I hope that one of the outcomes of this meeting will be the improvement of the cattle of this section. One of your farmers in this section laughed at me three or four years ago because I bred in a certain line, but he now says the laugh is the other way. I thought it was when I offered him $95 for a grade cow. I paid another farmer $100 for a grade cow, and she is the cheapest cow that I ever purchased, for practical purposes.

Mr. Hoard—I have a little three-quarter grade Jersey that Mr. Hintz here offered me $75 for, that doesn't weigh but a fraction over eight hundred pounds, and she gives me thirty pounds of milk a day, at the present time. She will make on fair dairy feed twelve and three-fourths pounds of butter a week, and she has made five and a half pounds in three days. As I have said before, this is a question of heredity. This cow comes from a long line of ancestry that means something. Let me give you a little illustration of what the meaning of ancestry is. I was in the veterinary office of Mr. Quickfall, in Philadelphia, in 1865, and he showed me a section of bone two inches long, taken from

the hind leg of a thoroughbred English racing horse. Their breed, you know, descends clear from the Arabian, thousands of years. He had also a two inch section between the fetlock and the gambril, taken from a Conastoga draft horse. The horse had weighed nineteen hundred pounds in his best days. The bone of the draft horse was nearly double in size that of the racing horse, yet the bone from the racing horse weighed the most. I thought to myself away back in the days of Mohammed this little bone started, and it had been held in a line of purity and re-inforced on either side, and up-builded and up-builded with the intelligent judgment of intelligent breeders, pursuing a straight, specific line. The doctor told me that that piece of bone from the leg of the racing horse was stronger than the finest steel that can be found. Those two pieces in the hind legs of the race horse were sufficient to throw him twenty-five feet at a jump, straight along, for a mile, two miles or three miles; and he says, "I tell you there are no two pieces of steel in God's world could stand it." That was breed. There was the hiding of inherited power.

REPORT OF THE COMMITTEE ON ESSAYS.

The committee beg leave to report that they have examined the essays offered, carefully, and are unanimous in their conclusions. They give the first award to the essay on butter-making.

L. B. ARNOLD,
T. D. CURTIS,
W. A. HENRY,
Committee.

BUTTER MAKING.

By MRS. W. E. BUSH, Sparta.

The following essay on granular butter making won the prize of $10.00:

To make good butter, all having care of cows and milk should work interestedly, conscientiously, and harmoniously. Each determining to "do his best, his very best, and do it every day."

Then having good *butter* cows, they may adopt the following plan with success:

1. Keep cows in clean, warm, ventilated stables in winter.
2. Treat gently: feed, water and milk regularly.

3. Food in winter: Corn, oats, ground, mix with bran, scald, and salt occasionally; also carrots, pumpkins, good timothy, clover, and cornstalks. Avoid turnips, cabbage, and decaying vegetables.

4. Food in summer: Good pasture and fodder-corn.

5. Pure water at all seasons.

6. Scrupulous cleansing of all utensils.

7. Milk rapidly, and quietly in pail that strains while milking, or cover pail with folds of mosquito netting; re-strain through both wire and cloth into deep cans.

8. Reduce and hold temperature at 50°.

9. Skim sweet.

10. Keep cream at moderate temperature until thickened, which indicates sufficient acidity.

11. Air by frequent stirring.

12. Churn in summer in early morning every other day. Sundays excepted. In winter not less than semi-weekly. Temperature 60°.

13. Stop churning when in granular state, draw buttermilk and add weak brine. Place pure white, rather than thin cloth in large seamless pan, half filled with brine, then remove butter to pan. Gather cloth with hand, drain, repeat until no trace of buttermilk.

14. Butter still in granules, salt (purely dairy 1 oz. per pound) by sifting evenly, stirring with ladle and turning on cloth.

15. Pack immediately in tubs, previously filled with hot brine, then thoroughly cooled.

16. Cover neatly with muslin, and set in cool, dry place to await shipment.

Report adopted.

REPORT OF COMMITTEE ON NOMINATIONS.

Your committee beg leave to submit the following names for officers for the ensuing year:

For President — W. H. Morrison, Madison.
For Secretary — D. W. Curtis, Ft. Atkinson.
For Treasurer — H. K. Loomis, Sheboygan Falls.
All of which is respectfully submitted,

HIRAM SMITH,
N. L. JAMES,
C. R. BEACH,
Committee.

On motion, the report was adopted.

THE FARMER'S PROFESSION.

By H. C. ADAMS, Madison.

The time has come when the word profession as applied to the farmer's business means something. The old saying that "any fool can be a farmer" is true, but there is a great and increasing force of truth in the modern maxim that "a fool cannot be a good farmer." Any fool can be a lawyer and a large percentage of the idiots that cumber the earth have undoubtedly reached out in that direction, but the close hard work of the profession requires a well trained brain in a sound body. The lawyer destitute of energy or sense goes to the wall and is laid to a financial rest in the same last ditch with the incompetent farmer and the same blanket of debt covers their unfortunate remains. Farms are no more properly asylums for human failures than law offices, dissecting rooms, or the thronged halls of commerce and trade. Farming has become an occupation for brains as well as muscle. Inventive genius has turned the business bottom upward and inside out during the last fifty years. The true philosophic spirit which first saw day in Lord Bacon is turning a flood of light upon every principle and detail of the farmer's vocation from the processes of plant life to the killing of potato bugs. That spirit of inquiry, of research, of painstaking investigation is constantly at work, undermining and blowing up popular humbugs, laying firmly and deeply in right reason and sound sense the foundations of agricultural science, and running leads in every direction for the golden grains of truth that may enrich and beautify the farmer's profession. For farming is a profession. It was not in the middle ages when tillers of the soil were looked upon as human vermin and christendom applauded ignorance and knightly butchery; it is not to-day in Mexico where a forked stick serves as a plow and where it is almost a sin against the Holy Ghost to have a new idea. But in this country where intelligent labor is honored and where laboratories, and colleges and experimental stations and newspapers and the active brains of the

farmers themselves are constantly moving the business to a higher and broader plan it is a profession of such importance and such possibilities that no man should take its name lightly. It requires health, energy, knowledge, sense and grit to be a good farmer. I do not believe that a natural taste for the business is absolutely necessary for the successful farmer. A man can be a good minister, or book agent, or politician, or doctor, or woman's rights man even if he doesn't like it. There may be a little waste of talent perhaps in the clash of sentiment, but grit can fill that gap and the man succeed. Poets may be born to their inheritance of imagery and song, but the farmer who is born into the requirements of his business are as scarce as angels among the business men of Chicago. A business like farming which gives play to taste, fancy, invention, originality in thinking and working can safely be called a profession. The man who pounds stone upon the highway has no profession. There is nothing in the business to call into play his mental powers, and but few of his physical. The workers in the mills and factories of the country move in the deepest and narrowest ruts of mechanical monotony. Numberless farmers drifting around in the back waters of by-gone practices and ideas have no profession, but the active, progressive, thinking man who finds in the accumulated knowledge of agriculture food for his memory, and in the changing seasons and fluctuating markets, the ups and downs of the commercial barometer, subjects for his reason, and in the unexplored mysteries of the soil objects for enthusiastic research, has a profession for which no abilities are too great, and no mental culture too thorough. The farmer's profession has the same inherent nobility that any other respectable occupation has and no more. Honest labor in any calling, whether in making shoes, selling calico, editing newspapers, preaching the gospel, courting a girl, driving mules, or running a great railroad corporation has the same stamp of divine approval. Our so-called republican democracy professedly recognizes no other principle. Practically it disregards and sneers at it to a very large extent as far as social and business life are concerned. While we farmers are very apt to think that we

have about all there is of the dignity of labor, the opinions of other classes often seem to be that the more labor we perform the less dignity we have and we keeping up our score in the foot race of error, fail to recognize as laborers the busy mental workers who filled the learned professions and who make the thronged bee-hives of commerce and trade hum with a ceaseless industry.

The profession of farming can confer no dignity upon a lazy man. It is no more a patent of nobility than a legal diploma and no less. A college student at the close of his course obtains a certificate of graduation. But that certificate is the worst kind of irredeemable paper unless backed by industry and well developed brains. The man who tills the soil follows a calling that has existed since the beginning of human life, but the calling itself can never raise him one iota above the plane fixed by his integrity, his ambition and his own intelligent efforts. There is no more essential nobility about the plowing of corn than the making of corsets, and sometimes not half so much. When the farmer puts heart, brain and soul into his business it becomes noble, when he fails to do that it becomes ignoble. I once heard an eloquent orator in addressing a gathering of farmers, pile up a magnificent rhetorical climax upon the fact that the fortunate possessor of a farm owned something that reached away down to the center of the earth and included all the air that lay on top of it, and from that misty basis he made his appeal to the farmers to love and honor their business. It appealed to a kind of sentiment about as valuable as that of the man who was said to have soarings after the unattainable and divings after the unfathomable, but who didn't pay cash. A man's claim upon the bowels of the earth and the vapors upon the upper air will make him respected by himself and everybody else only when he works that claim as it should be worked. The idea that a farmer's business has any peculiar excellence in itself should be forever set at rest by the farmers themselves who would make their vocation respected among men.

To learn how to perform physical labor is only a portion of the education required for the farmer's profession. It is

an important portion, but not all. The commanding officer of an army is a better general for having served in the hard routine of a private soldier. The successful merchant is largely successful because as a clerk he learned the plain details of his businesss. So the farmer should understand thoroughly all the kinds of manual labor that his business requires. In small operations it is clearly essential and in more extended fields it makes the farmer to properly value the labor he employs. But with the education of the hands should go the education of the head. Trained muscle invariably give way before trained brains.

The superiority of mental power to physical strength is perhaps a threadbare theme, but it is a gospel of truth that should be preached to the farmers of this and every other land until they shall stand equal and deservedly equal to the members of any other class. What is the difference between the Russian peasant and the American farmer? It is not a difference of muscular power which makes the American the more complete man, for the Russian has the advantage. It is simply a difference in mental culture, in mental development. One reads and thinks and works. The other simply works. One is a man, the other a machine and a poor one at that. Every one within reach of my voice knows of some hard-working farmer who is continually pulling a cat by the tail, whose hogs never weigh as much as he expects, whose cows go dry four months in the year, whose hay goes into the barn the color of tobacco, and whose tobacco comes out the color of good hay, who boasts that he don't fool away any money on newspapers, who looks upon an agricultural college as a reservoir of laziness, and an agricultural professor as a monumental humbug, who has griping pains over the airs which his neighbors put on, or rather which he thinks they put on, who never goes to a caucus and seldom to an election, but who continually bewails the corruptions of government, and whose children don't like the farm. Such a man works at a disadvantage. He is constantly trying to raise a weight with the short arm of the lever. The longer arm which gives him a far greater purchase rests in the brain which

God has given him to develop and to use. He does not study the points of his business and his relations to other classes as he would a problem in arithmetic. He does not make farming a profession. The education of the schools is immensely beneficial to any farmer who would work one acre or a thousand; the more thorough and complete the better. The academy can make a better farmer than the district school, the college a better farmer than the academy. The academy, the college and the agricultural school combined give the knowledge and mental discipline to any man who would be best equipped for the work and duties of the farmer's profession.

But, some one says, what does a knowledge of calculus amount to in raising beets, or an acquaintance with the principles of political economy and natural theology when you are trying to teach a calf to drink. Just this—the study of one gives power to think and to reason, a knowledge of the other gives that general information which is intellectual currency among intelligent men of all classes. As the best disciplined army has the best chance in battle, so has the best trained mind of the farmer the first chance of success in the struggle for independence upon the farm.

But while it is true that the best and quickest preparation can be obtained in the schools, true success in farming is often obtained without it. Men who have never been within the doors of an academy have fought their way through the hardships of a farmer's life to financial success, and have exhibited in their business those qualities which are apt to win victories in any calling. These men often claim that they are not educated but they are mistaken. All their lives they have absorbed knowledge as a sponge takes up water. The experience of their neighbors, their own experiments, the never ceasing stream of knowledge that flows over the land through the columns of the newspapers, public meetings and granges and farmers' clubs have been educating influences, giving them mental culture and knowledge and good common sense. These men, realizing their own strength are sometimes inclined to cry down any system of education but their own. They forget that the average

farmer has not the inherited grit and energy which they possessed to begin with; that the less talents we have the greater need for their development in the systematic mental training of the schools. I honor these men for the grand fight they have made in the battle of life against odds, but if we can give their children a better mental equipment to begin with, not money and lands, but minds enriched with the knowledge accumulated by the wisdom of all the men who have gone before them, then let us do so.

The farmer's profession can be elevated above its present standard only as the children improve upon the methods of their parents. Pres. Chadbourne of the Massachusetts Agricultural College, once said, that the way for young men to rise in the world, was to stand upon the shoulders of their fathers. We miss half the wear and tear in life when we acquire the faculty of profiting by the experience of other men. It proves nothing, that some finely educated man has failed in farming or that some uneducated men have succeeded. Education will help a man, but it will never make one. When it can be proved that a majority of educated men upon farms are failures and a majority of the uneducated successful, we shall all begin to question the propriety and value of education for the farmer's profession. But until that is proved we shall believe that the farmer's business stands upon the same basis that supports all other kinds of business, that the general education which is useful to the doctor, the lawyer, the man upon the board of trade is just as valuable to the man who tills the soil, and that professional training in schools of agriculture will have the worth upon the farm that the knowledge and discipline of the law school has in practice before the courts.

One thing more. The circumstances of a farmer's life are such that he is brought into closer, because more constant contact with his family than men engaged in other pursuits. His partnership with the companion of his life is, in a business sense certainly a very close one. Side by side they often perform the same kinds of labor, and the silent partner not unfrequently bears the heaviest burdens. Many of us

in the rush and amid the distracting cares of our business, forget that woman's strength is not man's strength, that a ceaseless monotony of toil takes laughter from the lips, roses from the cheeks and health from the body. No sensible man would desire that farmer's wives should be transformed into useless ornaments; but it should be the aim of farmers who would do honor to their profession, to make their mothers and wives and daughters something more than mere household drudges, to give them an opportunity as far as means will permit, to satisfy those fancies and tastes, to cultivate those graces, and those talents which are the beauty and the charm of true womanhood.

A NARRATIVE IN THREE CHAPTERS.

By W. D. HOARD, Fort Atkinson.

Mr. President, Ladies and Gentlemen: A narrative in three chapters. Now if I should state just exactly what I legitimately think was my best narrative in three chapters, it would be the three stalwart boys that I have. I have three chapters that I hope, with a father's pride, that some day when I have laid down my bundle, will take it up and go on and do their duty by the old farm (which at present is the printing office) just as well as they know how. But I don't believe that my family relations interest you as much as I am supposed to be interested, and I confess to you that I have asked every person here, who evidently had a finger in the invention of this topic, what it meant, and they don't seem to know. They all said it meant Hoard.

Well, now we are about through, my friends, with this long and serious discussion. I can remember when I was a boy that we used to have a fellow work for us on the farm in New York, who used to encourage me a great deal, and

he would say, "Now, boy, you hump into it, and do the best you can, and after dinner you can turn the grind stone to rest you," and I guess they have got me at the crank here. Nature gave me a long face, and a long nose, and an expression to match. Speaking of a long nose makes me think of a story.

I always confess to having a sort of a tender side for an Irishman. There was one old Irish woman in our town that was a veritable old beggar, and she had a nose that when she warmed up, as she did occasionally, would show like the twin lights of neversink. She used to come in and beg a trifle of me. And I would generally give her something as indeed I would anybody that would approach me as eloquently as she did. She would adjure the heavens to make my bed soft, and that was worth a quarter of a dollar at any time.

One cold snapping day she came into my office, wringing her hands with the most woe begone expression on her old face, she said, "ah, God knows what I'll do, what I'll do at all.' I said "what is the matter Biddy, what is the matter?" "Ah, God knows" she says "I'm near gone dead with the freezing. Divil a stick I get, except on the railroad, and I don't know what I'll do." I looked at her for a minute, and the spirit of mischief entered into me, and I thought I would chaff her a bit, though I might have known better, I said, "ah, Biddy, but your old nose has a fine cheerful glow upon it this morning; it looks as pleasant as a coal fire." A change in that old face was but the work of a moment. She turned upon me the worst look of contempt I ever got from any woman, and said, "ah, nose!! nose!! did you say? By the divil, if I had a nose like yours it would take forty cords of wood to keep it warm."

On motion of Mr. Hoard, the president appointed the following committee to confer with other associations in the Northwest, on the subject of a permanent dairy and dairy stock show, as contemplated by resolution No 9. The following committee was appointed: W. D. Hoard, D. W. Curtis, N. L. James and H. C. Adams.

President Morrison — We will now proceed to close this convention, and I feel that the work, the effort that has been participated in so earnestly by the advanced thinkers of the dairy industry, and which will appear in the annual report will be indicative of progress.

Revolutions never go backward. The Wisconsin Dairymen's Association has the reputation of being the advanced courier of pioneer thoughts and methods. It has ever been alert to direct, assist and supply the dairymen of the state with the very knowledge, the practical education they most need to make the dairy the most important of all Wisconsin industries.

The resolution passed this afternoon, by such unanimity declared for a dairy show to be held by the dairymen themselves, and so organized that it will be above all humiliating alliances with any questionable or exceptionable associations, which shall bring down and degrade our fair fame as dairymen, I hold to be the most important action of this body and I trust we shall all go away with a fixed determination to carry out the full spirit of the resolution.

In conclusion, I will say that during the spirited discussions that have taken place, forbearance, harmony, and a just consideration of all has been exercised, and I trust have marked all our deliberations; but if any hot, hasty remarks or rulings have been made in the heat of debate, I assure you they have been unintentional, and as we disperse let only pleasant memories be retained and cherished as well as the useful practical thoughts, ideas and suggestions which exalt and ennoble the great industry we represent. Again thanking you for your attention and the many acts of kindness you have extended, I now declare this convention adjourned *sine die.*