Twenty-third annual report of the Wisconsin Dairymen's Association : held at New London, Wisconsin, February 13, 14 and 15, 1895. Report of the proceedings, annual address of the president, and intere...

Wisconsin Dairymen's Association
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W. D. Hoard

TWENTY-THIRD ANNUAL REPORT

OF THE

WISCONSIN

DAIRYMEN'S ASSOCIATION

HELD AT

New London, Wisconsin, February 13, 14 and 15, 1895.

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

COMPILED BY

D. W. CURTIS, Secretary.

MADISON, WIS.:
DEMOCRAT PRINTING COMPANY, STATE PRINTER,
1895.

LETTER OF TRANSMITTAL.

OFFICE OF THE SECRETARY,

Wisconsin Dairymen's Association,

FORT ATKINSON, May 10, 1895.

To His Excellency, W. H. UPHAM,

Governor of the State of Wisconsin:

I have the honor to submit the twenty-third Annual Report of the Wisconsin Dairymen's Association, showing the receipts and disbursements the past year, also papers relating to the dairy interests, read at the Annual Convention held at New London, Waupaca county.

Respectfully submitted,

D. W. CURTIS,

Secretary.

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OFFICERS 1895.

PRESIDENT.

C. H. EVERETT,

BELOIT, ROCK COUNTY.

VICE PRESIDENTS.

HON. CHESTER HAZEN, RIPON, FOND DU LAC COUNTY,
President Wisconsin Dairymen's Association from 1872–4.

HON. HIRAM SMITH, SHEBOYGAN FALLS, SHEBOYGAN COUNTY,
President Wisconsin Dairymen's Association from 1875–6. Died May 15. 1890.

HON. A. D. DELAND, SHEBOYGAN, SHEBOYGAN COUNTY,
President Wisconsin Dairymen's Association, 1877.

HON. H. F. DOUSMAN, WAUKESHA COUNTY,
President Wisconsin Dairymen's Association, 1878.

HON. Z. G. SIMMONS, KENOSHA COUNTY,
President Wisconsin Dairymen's Association, 1879.

HON. STEPHEN FAVILL, MADISON, DANE COUNTY,
President Wisconsin Dairymen's Association, 1880.

HON. C. R. BEACH, WHITEWATER, WALWORTH COUNTY,
President Wisconsin Dairymen's Association from 1881–2.

HON. W. H. MORRISON, ELKHORN, WALWORTH COUNTY,
President Wisconsin Dairymen's Association from 1883–6. Died December 13, 1893.

HON. H. C. ADAMS, MADISON, DANE COUNTY,
President Wisconsin Dairymen's Association from 1887–9.

PROF. W. A. HENRY, MADISON, DANE COUNTY,
President Wisconsin Dairymen's Association, 1890.

EX-GOV. W. D. HOARD, FORT ATKINSON, JEFFERSON COUNTY,
President Wisconsin Dairymen's Association from 1891–3.

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 this 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 president, 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 be held 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, 1895.

Allen, C. R., Allenville.
Anson, J. F., New London.
Allen, C. L., New London.
Allen, N. E., Beaver Dam.
Andrew, H. G., New London.
Ayer, H. M. Jr., Lodi.
Aderhold, E. L., Neenah.

Boyd, R. M., Racine.
Bussard, R. M., Black Earth.
Bonnine, Herman, New London.
Becker, E., New London.
Bleck, Aug., New London.
Bartlett, T., New London.
Brahan, M., New London.
Baker, Chas., Seymour.
Blank, Jo., New London.
Bowlman, Fred, New London.
Bacon, H. L., New London.
Below, A., New London.
Barnes, A. D., Waupaca.
Barnum, Wm. M., New London.
Buboltz, Fred, New London.
Beyer, Geo., New London.
Buboltz, John, New London.
Burhultz, J., Readfield.
Breteck, C. J., South Osborn.
Buschbauer, Hans, Jefferson.
Benecke, D., Fontenoy.
Brigham, Chas. I., Blue Mounds.
Beyers, W. H., Hawksburg, Ont., Canada.

Curtis, F. C., Rocky Run.
Cornish, Curtis & Green Mfg. Co., Fort Atkinson.
Cooney, John, New London.
Curtis & Zuahn, New London.
Clark, Mat., New London.
Culbertson, J. O., Medina.
Culbertson, H. M., Medina.
Cuff, A., New London.
Church, A., Winchester.
Covill, H. P., Berlin.
Carr, Chas. F., New London.
Cline, Geo. W., New London.
Cushman, Wm., New London.
Crage, Mall, New London.
Clark, A. J., Osman P. O.
Chaplin, H. A., Plymouth.
Crane, C., Albion.
Creamery P. Co., Chicago.
Crosby, D. S., Fond du Lac.
Cook, L. H., Lake Mills.
Cornwell, Chas. B., Richland Center.
Clark, J. J., Berlin.
Carpenter, F. J., Apple Creek.
Chapman, W. C., Oakfield.
Cate, A. G., Amherst Junction.
Cannon, Henry, New London.
Carpenter, E. G., Hortonville.

Dillie, W. E., Chicago.
Dawley, G. T., New London.
Decker, A. J., Fond du Lac.
Dickinson, C. E., New London.
Demming, J. M., New London.
Dickson, W. C., Madison.
Dally, B. H., Milwaukee, Star U. Line.
Downing, H. K., Fond du Lac.
Dox, Geo. G., Drybone.
Dedolph, W., New London.

Eastman, E. L., Saukville.
Ende, A. L., New London.
Ellsner, Ernest, New London.
Eagan, Jerry, New London.
Elared, H. S., Milwaukee.

Farnam, E., Stephensville.
Farrington, Mrs. E. C., Rocky Run.

Firgot, F. C., New London.
Frank, Wm., New London.
Furst, Julius, New London.
Furst, Fred, New London.
Freiburger, J. M., New London.
Fulbe & Lyon, New London.
Flanigan, John, New London.
Fuller, E. G., Brillion.
Frieburger, John, New London.
Frieburger, Geo., New London.
Foote, A. D., New London.
Fults, R. S., Lamertine.
Friday, H. P., Markesan.
Frohcht, W. H., Franklin.

Granger, Dorothy, Bear Creek.
Grandine, J. W., Sherwood.
Gray, John, Sherwood.
Graynor, Robert, New London.
Gaugh, Bill, Sugarbush.
Graupman, Wm., New London.
Green, R. C., Albion.
Germer, Jos., Frazer.
Greengo, A. L., Colgate.

Handschae, J. W., New London.
Harris, P., New London.
Hanke, Aug., New London.
Huchinson, Jas., New London.
Hannson, W. M., New London.
Hidde, Rudolph, New London.
Hebbe, D., Sugarbush.
Hanke, Chas., Sugarbush.
Hyde, T. N., Bear Creek.
Hamm, Wenzel, New London.
Hulbert, W. F., Appleton.
Hills, A. R., New London.
Heubner, E. A., New London.
Heubner, Aug., New London.
Heickey, John, New London.
Hoffman, Jacob, Sugarbush.
Hintz, Wm., New London.
Huchinson, Alex., New London.
Hamblin, H., New London.
Hermann, Wm., New London.
Hoffman, Fred, Waldo.
Horton, R. H., Fond du Lac.
Harriman, Fred E., Appleton.
Hart, J., Neenah.
Hoard, F. W., Fort Atkinson.

Haecker, T. L., St. Anthony Park, Minn.
Hahn, Chas., Cicero.
Hubert, John, Albany.
Hoffman, Gilbert, Jefferson.
Hamblin, H., Sugarbush.
Johnson, C. A., Sugarbush.
Jamison, W. G., New London.
Jepson, Warren, Bear Creek.
Johnson, R. S., New London.
Jones, C. S., Basswood.
Jones, W. F., Burnett Junction.
Jones, Wm. S., Winchester.
Jennings, A. A., Chicago, Star U. Line.
Johnson, W. R., Appleton.

Korb, E., Marytown.
Kuehn, Mrs. J. F., Princeton.
Kasper, P. H., Nicholson.
Kemph, Aug., Sugarbush.
Krueger, G., Sugarbush.
Kuehn, John, New London.
Knabe, Otto, Reedfield.
Kethroe, Henry, New London.
Knapstein, H., New London.
Keith, M. D., New London.
Kickhoefer, Wm., Sugarbush.
Klug, R., New London.
Kamp, Edwin, Neenah.
Kampine, P. E., Seymour.
Kolt, A., Seymour.
Knight, Chas. Y., Chicago, 181 S. W. St.
Kimball, W., Union Center.
Knapstein, T., New London.

Lindsay, Geo., Manawa.
Lipke, Chas., New London.
Lieby, C. M., New London.
Lipke, B. A., New London.
Lutsey, Elwood, New London.
Lipke, W. E., New London.
Lighthart, G., Seymour.
Lee, Frank, Evansville.
Law, Davis, New London.

Miller, A. C., Stephensville.
McKinney, F. M., Kirkwood.
Murray, James, Sugarbush.
Motz, John, Sugarbush.

Meiklejohn, A. G., New London.
Mock, Merton, New London.
McLaughlin, Miss Nell, New London.
Miller, Charlie, New London.
Madison, John, Marion.
Madison, Hans P., New London.
Meyer, Chas., Kewaunee.
McMurdo, James, Hortonville.
Millard, F., Cottage Grove, Ore.
Merrill, S. R., Neenah.
McBride, O., Milwaukee.
Murphy, A. L., Hortonville.
Morgan, Ed., New London.
Mass, Aug., New London.
Meinhart, Aug., New London.
Moder, John, New London.
Millard, Arthur, New London.
Murray, G. E., New London.
Marsch, Bernard, New London.
Meyers, H. F., Greenleaf.
McLeod, G., Chicago.
Miche's, Mat., Calumetville.
McKerrow, Geo., Madison.
Mecker, Albert, Kimesh.

Nelson, Birdell, Dale.
Nussbaum, John, New London.
Nussbaum, Wm., New London.
Nass, Herman, New London.

Oelfe, Henry, New London.

Paul, C., Neenah.
Phillips, W. H., Waupun.
Plath, Aug., New London.
Pape, A. H., New London.
Patton, W. H., New London.
Page, H. H., New London.
Pheatt, H. D., Milwaukee Mercantile Dispatch.
Pribbenow, C., Zittan.
Pribbenow, Wm., Zittan.
Potts, G. L., Appleton.
Peacock, E. C., Sheboygan.
Patton, J. E., Milwaukee.
Protman, Antone, Orihula.

Rusham, Henry, New London.
Roloff, Aug., New London.
Rasmussen, L., New London.
Roloff, Wm., New London.
Roesslar, J. W., Bear Creek.
Robbins, J. H., Elmira.
Rather, W. F., Calumet Harbor.
Robbinson, A. S., Centralia.
Rhods, Richard, New London.
Rust, J., North Greenfield.
Ramm, Chas., New London.
Ramm, E. H., New London.
Rivers, Chas., New London.
Radloff, M. P. E., Hustisford.
Reineking, F. C., Appleton.
Root, W. S., Medina.
Reitz, A. W., Seymour.
Rather, W. F., Calumet Harbor.
Rundell, A. E., Livingston.
Smith, C. R., Zion.

Simon, N., Neenah.
Stuckland, Geo. R., New London.
Stewart, Wm., Sugarbush.
Shamerock, Chas., New London.
Siegel, John, New London.
Spence, John, New London.
Skidmore, H., Stockbridge.
Soltz, A. F., Poygan.
Schmal, J. M., New London.
Stiehman, Fred, New London.
Sullivan, Garrett, New London.
Sell, R. O., Manchester.
Spiegelburg, Carl, Zitta.
Stambel, C. A., Green Bay.
Schmiedel, Emil, Calumetville.
Stangal, James A., Stangalville.
Sette, M., Juneau.
Sweeney, W., Fox Lake.
Sprout, L. L., Juneau.
Schutz, A. F., Poygan.
Shaw, Wm., New London.

Tolverson, Nels C., Cute.
Tate, John G., New London.
Tipler, David, Neenah.
Trayser, A., New London.
Trayser, M., New London.
Trayser, W., New London.
Thearn, John, New London.
Thorp, C., Burnett Junction.
Tullar, F. S., Neenah.

Vashgar, Chas., New London.
Vestrich Bros., New London.

Vogt, John, Orihula.
Vogt, Jo., Orihula.
Voss, Chris, New London.

Wing, R. S., Appleton.
Westphal, G., New London.
Wright, S. E., New London.
Werner, Geo. W., New London.
White, C. A., Fond du Lac.
Washburn, J. R., Oshkosh.
Walker, C. R., Chicago.
Wittke, Robert, Brillion.
Willimann, Joseph, Sterns.
Woodruff, W. H., Green Bay.
Williams, H. R., Ripon.

Young, Geo., New London.

Zeamer, Fred, Sugarbush.
Zeamer, Herman, Sugarbush.
Zahrt, Wm., Stephensville.
Zithske, Wm., New London.
Ziemer, Ferdinand, New London.
Ziemer, Louis B., New London.

TWENTY-THIRD ANNUAL MEETING

OF THE

WISCONSIN DAIRYMEN'S ASSOCIATION,

Held at the Opera House, New London, Wis., Wednesday, Thursday and Friday, February 13, 14, 15, 1895.

PROGRAMME.

Wednesday Morning Session.

I. President Everett will call the Association to order, and the business of the Convention will commence at once.

1. Organization of Convention.

2. Address of Welcome by Hon. R. S. Johnson, New London.

3. Response by C. P. Goodrich, Fort Atkinson, Wis.

4. Annual Address by the President.

Wednesday Afternoon Session.

II. Milk Producers' Session.

At this session will be discussed the best methods in use for the production of milk, including the feed, care and surroundings of the cow. Discussions will follow each paper read at the Convention.

1. How to Breed a Herd of Dairy Cows—H. C. Taylor, Orfordville, Wis.

2. How Shall We Grow the Best and Most Succulent Cow Feed?—C. P. Goodrich, Fort Atkinson, Wis.

3. Soiling Dairy Cows—Prof. W. A. Henry, Madison, Wis.

Wednesday Evening Session.

III. Milk Producers' Session—Continued.

1. Dignity of Labor—Miss Harriet A. Oertel, New London, Wis.

2. Importance of Summer Soiling of Cows—Rhodell Crossfield, Oakland, Wis.

3. Stable Management of Cows in Winter—C. L. Hill, Rosendale, Wis.

4. The Dairyman and the Hog—A. Selle, Mequon, Wis.

5. Address on Farm Topics—T. J. Van Matre, Fayette, Wis.

Thursday Morning Session.

IV. Cheese Makers' Session.

This session will be full of interest to cheese makers and patrons of cheese factories.

1. Hints to Cheese Makers and Patrons—E. L. Aderhold, Neenah, Wis.

2. The Value of Whey and How to Handle it at the Factory and Farm—H. J. Noyes, Richland Center, Wis.

3. The Making of Fancy Brands of

Cheese—Prof. T. L. Haecker, Experiment Station, St. Anthony Park, Minn.

Thursday Afternoon Session.

V. Cheese Makers' Session.—Continued.

1. Some Undesirable Bacteria in Cheese Making—Prof. H. L. Russell, Bacteriologist, Experiment Station, Madison, Wis.

2. The Enemies of the Wisconsin Cheese Industry—Gov. W. D. Hoard, Fort Atkinson, Wis.

3. Reports of Cheese Instructors, W. H. Phillipps, Waupun, Wis.

Thursday Evening.

Banquet.

Friday Morning Session.

VI. The General Session.

At this session will be discussed the Butter Side of Dairying.

1. Shall We Patronize the Creamery or Make Up the Milk at Home?—F. C. Curtis, Rocky Run, Wis.

2. Making and Marketing of Farm Butter—M. T. Allen, Waupaca, Wis.

3. The Record of My Cows for '94—A. G. Cate, Amherst, Wis.

4. The Better Profit of Liberal Feeding—Chas. Meyers, Kewaunee, Wis.

Friday Afternoon Session.

VII. "Free-for-all" Session.

The Association desires any one who wants information on any subject pertaining to dairy matters, to submit in writing such questions as they may wish answered, handing same to the secretary as early in the Convention as possible.

1. The Necessity of Testing a Dairy Herd—W. K. Stiles, Lake Mills, Wis.

2. The Value of a Dairy Record—C. S. Arnold, Lake Geneva, Wis.

3. The Question Box.

PREMIUMS.

Butter and Cheese.

The Association offers the following Premiums on Wisconsin Dairy Products:

Class I —Dairy Butter.....$50.00
Class II.—Creamery Butter....$50.00
Class III.—Print Butter. Not less than three pounds made into prints.
First premium.....$5.00
Second premium.....$3.00
Third premium.....$1.50
Class IV.—Cheese. Cheddars, Flats, Young Americas, Swiss or Brick.....$50.00
Class V. ....Silver Cup

The premiums under classes 1, 2 and 4 will be awarded on the excess pro-rata plan, to all entries in their respective classes scoring over 90 points. Exhibitors will be limited to one package only in each class, and not more than $15 shall be awarded in one class to any exhibitor.

Special Premiums for Cheese.

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; prize to be retained by the winner 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.

Butter from the milk of a single herd of cows owned by one person, firm, or corporation, and made on the premises where the milk is produced, shall be classed as Dairy Butter. Butter from the mixed milk or cream of two or more herds owned by different persons, firms or corporations, and made in a factory habitually using the milk or cream from more than a single herd, shall be classed as Creamery Butter.

RULES.

Butter and Cheese Exhibit.

1. Every exhibitor must be a member of the Association. One dollar secures a membership and the annual report of the Convention.

2. Butter made at any time and packed in eight pound pails, or twenty pound tubs, or over, except in Class 3.

3. Scale of points for judging butter: Flavor 45. Grain 25. Color 15. Salting 10. Packing 5. Total 100.

4. Scale of points for judging cheese: Flavor 45. Texture and Stock 30. Color 15. Finish 10. Total 100.

5. Exhibitors will be limited to one package only in each class.

6. Butter and cheese may be shipped by express, charges must be prepaid, with name and address on each package, to H. K. Loomis, New London, Wis.

Manufacturers, dealers and inventors of dairy goods, are invited to make an exhibit. No award or premium will be given. Ample room provided.

Cheese and butter makers wanting situations for next season, should leave their names with the secretary, written on a card, with their P. O. address.

Dairy and Food Laws

OF WISCONSIN.

OF THE OFFICE AND DUTIES OF THE DAIRY AND FOOD COMMISSIONER.

1. Appointment, term and compensation. [Sec. 1, ch. 452, laws of 1889.] The office of dairy and food commissioner for the state of Wisconsin, is hereby created. Such commissioner shall be appointed by the governor, by and with the advice and consent of the senate, and his term of office shall be for two years from the date of his appointment, and until his successor is appointed and qualified; provided, that the term of office of the commissioner first appointed under this act shall expire on the first Monday in February, 1891, and vacancies occurring in the office for any cause shall be filled by appointment for the balance of the unexpired term. The salary of the commissioner shall be twenty-five hundred dollars per annum and his necessary and actual expenses incurred in the discharge of his official duties

2. Assistants, their qualifications and salaries. [Sec. 2, ch. 452, laws of 1889.] Such commissioner may, with the consent and advice of the governor, appoint two assistants, each of acknowledged standing, ability and integrity, one of whom shall be an expert in the matter of dairy products and the other of whom shall be a practical analytical chemist. The salaries of such assistants shall not exceed eighteen hundred dollars each per annum and their neces-

sary and actual expenses incurred in the discharge of their official duties.

3. Commissioner's duties. [Sec. 3, ch. 452, laws of 1889.] It shall be the duty of the commissioner to enforce all laws that now exist, or that may hereafter be enacted in this state, regarding the production, manufacture or sale of dairy products, or the adulteration of any article of food or drink or of any drug; and personally or by his assistants to inspect any article of milk, butter, cheese, lard, syrup, coffee or tea, or other article of food or drink or drug, made or offered for sale within this state which he may suspect or have reason to believe to be impure, unhealthful, adulterated or counterfeit, and to prosecute, or cause to be prosecuted, any person or persons, firm or firms, corporation or corporations, engaged in the manufacture or sale of any adulterated or counterfeit article or articles of food or drink or drug, contrary to the laws o this state.

4. His powers—Sealing samples—Refusing to sell for analysis. [Sec. 4, ch. 452, laws of 1889.] Said commissioner or any assistant shall have power in the performance of his official duties to enter into any creamery, factory, store, salesroom or other place or building where he has reason to believe that any food or drink or drug is made, prepared, sold or offered for sale, and to open any cask, tub, package or receptacle of any kind containing, or supposed to contain, any such article, and to examine or cause to be examined and analyzed the contents thereof; and the commissioner or any of his assistants may seize or take any article of food or drink or drug for analysis, but if the person from whom such sample is taken shall request him to do so he shall at the same time, and in the presence of the person from whom such property is taken, securely seal up two samples of the article seized or taken, the one of which shall be for examination or analysis under the direction of the commissioner, and the other of which shall be delivered to the person from whom the articles were taken. And any person who shall obstruct the commis-

sioner or any of his assistants by refusing to allow him entrance to any place which he desires to enter in the discharge of his official duty, or who refuses to deliver to him a sample of any article of food or drink or drug made, sold, offered or exposed for sale by such person, when the same is requested and when the value thereof is tendered, shall be deemed guilty of a misdemeanor punishable by a fine of not exceeding twenty-five dollars for the first offense and not exceeding five hundred dollars or less than fifty dollars for each subsequent offense.

Questions of evidence as to sealing and analysis. If there is contradictory evidence concerning the sufficiency of the seal of a sample, and the credibility of the witnesses for the prosecution is submitted to the jury, the defendant is not injured. If there is evidence that a few drops of carbolic acid was added to a sample of milk, and it is submitted to the jury as a question of fact whether this would change the character of the milk, make the analysis impossible or difficult, or in any way injuriously affect the sample for the purpose of analysis, the defendant has no cause of complaint. Commonwealth v. Spear, 143 Mass., 172.

It is observed of a similar statute that it is intended to secure a fair examination and analysis, by providing the defendant with the means of making an analysis of a portion of the same specimen which the state has analyzed. If the sample is not saved, or not saved in proper condition, he has no means of showing that his evidence, if any he has as to the quality of the milk, applies to that with reference to which the government witnesses have testified. It cannot be said that a portion reserved is sealed, within the meaning of the statute, when wax is merely placed on the top of the cork, and not extended over the mouth of the bottle, thus making it air-tight, if it is shown that the character of the milk will be affected by the air. Commonwealth v. Lockhardt, 144 Mass., 132.

Where the article analyzed has not been taken under the statute the competency of evidence is to be determined by the common law, and the testimony of any person who had sufficient skill to analyze it, and who has analyzed some which was proven to have been sold by the defendant, is admissible. Commonwealth v. Holt, 146 Mass., 38.

5. District attorneys to assist—Disposition of fines. Sec. 5, ch. 452, laws of 1889.] It shall be the duty of the district attorney in any county of the state, when called upon by the commissioner or any of his assistants, to render any legal assistance in his power to execute the laws,

and to prosecute cases arising under the provisions of this act; and all fines and assessments collected in any prosecution begun or caused to be begun by said commissioner or his assistants shall be paid into the state treasury.

Counsel may be employed. See paragraph 23, which also provides that district attorneys shall assist the commissioner.

6. Analysis of articles—Assistance at institutes, etc. [Sec. 6, ch. 452, laws of 1889.] With the consent of the governor, the state board of health may submit to the commissioner, or to any of his assistants, samples of water or of food or drink or drugs, for examination or analysis, and receive special reports showing the result of such examination or analysis. And the governor may also authorize the commissioner or his assistants, when not otherwise employed in the duties of their offices, to render such assistance in the farmers' institutes, dairy and farmers' conventions, and the agricultural department of the university, as shall by the authorities be deemed advisable.

7. Payment of salaries and expenses. [Sec. 7, ch. 452, laws of 1889.] The salaries of the commissioner and his assistants shall be paid out of the state treasury in the same manner as the salaries of other officers are paid, and their official expenses shall be paid at the end of each calendar month upon bills duly itemized and approved by the governor, and the amount necessary to pay such salaries and expenses is hereby appropriated annually.

8. Laboratory, and materials for. [Sec. 8, ch. 452, laws of 1889.] The commissioner may, under the direction of the governor, fit up a laboratory, with sufficient apparatus for making the analysis contemplated in this act, and for such purpose the sum of fifteen hundred dollars, or so much thereof as may be necessary, is hereby appropriated, and for the purpose of providing materials and for other necessary expenses connected with the making of such analyses, there is also hereby appropriated so much as may be necessary, not exceeding six hundred

dollars annually. The appropriations provided for in this section shall be drawn from the state treasury upon the certificates of the governor.

9. Biennial report. [Sec. 9, ch. 452, 1889, as amended by ch. 109, 1893.] Said commissioner shall be furnished a suitable office in the capitol, at Madison, and shall make a biennial report to the governor, which shall contain an itemized account of all expenses incurred and fines collected, with such statistics and other information as he may regard of value; and with the consent of the governor not exceeding twenty thousand copies thereof, limited to three hundred pages, may be published biennially, as other official reports are published, and of which five thousand copies shall be bound in cloth.

Stationery. Ch. 197, laws of 1895, authorizes the commissioner to obtain stationery for the use of his office.

SALE OF IMPURE MILK.

10. Penalty for. [Sec. 1, ch. 425, 1889.] Any person who shall sell or offer for sale or furnish or deliver, or have in his possession, with intent to sell or offer for sale or furnish or deliver to any creamery, cheese factory, corporation, person or persons whatsoever, as pure, wholesome and unskimmed, any unmerchantable, adulterated, impure or unwholesome milk, shall upon conviction thereof be punished by a fine of not less than ten nor more than one hundred dollars for each and every offense.

Validity of statute. A New York law (ch. 183 of 1885, ch. 202 of 1884), providing that "no person or persons shall sell, supply or bring to be manufactured, to any butter or cheese manufactory, any milk diluted with water, or any unclean, impure, unhealthy, adulterated or unwholesome milk," has been sustained as a valid exercise of legislative power. People v. West, 106 N. Y., 293.

Construction—Indictment. The New York law does not make fraudulent intent a necessary ingredient of the offense and it would not be a reasonable construction of it to apply it to a dairyman who owns and

conducts a butter or cheese factory for the manufacture of those articles from milk furnished exclusively by himself, from his own cows. If the defendant is such a person, these facts are matter of defense, and their existence need not be negatived on the face of the indictment. People v. West, 106 N. Y., 293.

Under a Massachusetts law imposing a penalty for selling or offering to sell "adulterated milk, or milk to which any foreign substance has been added," it is immaterial whether the substance added is injurious or not. The indictment need not allege the quantity of such substance. Commonwealth v. Schaffner, 16 Northeast. Rep., 280; 146 Mass., 512.

Under an act which prohibits the sale of milk which is not of a good, standard quality, the fact that the milk was delivered under a contract to furnish the person who bought it with the milk of one dairy, is not a defense if that furnished was not of such quality. The contract would be held to contemplate milk which should be bought and sold. Commonwealth v. Holt, 14 Northeast. Rep., 930; 146 Mass., 38.

Intent to sell, evidence of. Where one is charged with having in his possession, with intent to sell, milk which is not of a good, standard quality, the fact that he was upon a wagon which had his name painted on it, and that therein were cans of milk, and that a sample was given from one of them to one employed by the milk inspector for analysis, is competent evidence to go to the jury upon the question of his intent. Commonwealth v. Rowell, 15 Northeast. Rep., 154; 146 Mass., 128.

Effect of the act of 1889 upon previous laws. It seems reasonably clear that sec. 1, of ch. 425, laws of 1889, paragraph 10, supersedes sec. 1, of ch. 157, laws of 1887, as to the offense of selling diluted, impure and unclean milk. Both the acts referred to cover the provisions of sec. 4607, R. S., and hence that section is not in force.

11. Standard for pure. [Sec. 2, ch. 425, 1889.] In all prosecutions or other proceedings under this or any other law of this state relating to the sale or furnishing of milk, if it shall be proven that the milk sold or offered for sale, or furnished or delivered, or had in possession with intent to sell or offer for sale, or to furnish or deliver as aforesaid, as pure, wholesome and unskimmed, contains less than three per centum of pure butter fat, when subjected to chemical analysis or other satisfactory test, or that it has been diluted or any part of its cream abstracted, or that it or any part of it was drawn from cows known to the person complained of to have been within fifteen days before or four days after parturition, or to have any dis-

eases or ulcers or other running sores, then and in either cases the said milk shall be held, deemed and adjudged to have been unmerchantable and adulterated, impure or unwholesome, as the case may be.

Validity of provision as to standard of purity. The supreme court of New York has ruled that a statute which provides that milk which contains less than three per centum of fat shall be declared adulterated is unconstitutional. The ground upon which this was held was that the statute deprived the defendant of his liberty and property without due process of law, in that it barred him of the right upon the trial of the accusation against him to have the issue determined according to what might be the proof, and compelled him to submit to the statutory declaration thereof without regard to the truth. People v. Cipperly, 37 Hun, 317. This decision was not unanimous, and on appeal was reversed by the court of appeals, without opinion, and on the grounds given by the dissenting judge of the supreme court. People v. Cipperly, 101 N. Y., 634.

A law of New Hampshire (ch. 42, laws of 1883), prohibited the sale of adulterated milk, or milk to which water or any foreign substance has been added, or, as pure, milk from which the cream or a part thereof has been removed. It authorized inspectors of milk to take samples and cause the same to be analyzed, and expressed that in all prosecutions under it if the milk is shown by analysis to contain more than eighty-seven per cent. of watery fluid, or less than thirteen per cent. of milk solids, it shall be deemed for the purposes of the statute to be adulterated. It was contended that the clause fixing the standard was unconstitutional. In answer the court said: "The statute tends to discourage the breeding of a certain class of cattle for the supply of the milk market. The difficulty of guarding against the adulteration of milk may have influenced the legislature in fixing a standard of richness. Practically it makes no difference whether milk is diluted after it is drawn from the cow, or whether it is made watery by giving her such food as will produce milk of an inferior quality, or whether the dilution, regarded by the legislature as excessive, arises from the nature of a particular animal, or a particular breed of cattle. The sale of such milk to unsuspecting consumers, for a price in excess of its value, is a fraud which the statute was designed to suppress. It is a valid exercise by the legislature of the police power for the prevention of fraud, and protection of the public health, and as such is constitutional." State v. Campbell, 13 Atl. Rep., 585; 64 N. H., 402.

In Rhode Island a similar provision has been sustained against an objection to its validity on the ground that it virtually confined the testimony to the analysis of the samples taken by the inspector, which sam-

ples were destroyed in making the analysis, so that the testimony could not be controverted. The court, however, was of the opinion "that the testimony, though it may not always be practicable to controvert directly by another analysis, can be controverted by evidence of collateral facts going to prove that the analysis is incorrect, and, therefore, that the act is not unconstitutional for the reason alleged." State v. Groves, 15 R. I., 208; 2 Atl. Rep., 384. Shivers v. Newton, 45 N. J. L., 469, is to much the same effect.

Intent immaterial.—The doing of the act condemned by the law constitutes the offense, if it is silent as to the knowledge or intent of the person who is charged with violating it. People v. Kibler, 106 N. Y., 321, 12 N. E. Rep., 795.

12. Proof of adulteration, how made. [Sec. 2, ch. 157, 1887, as amended by ch. 344, 1889.] Proof of adulterations and skimming may be made with such standard tests and lacometers as are used to determine the quality of milk, or by chemical analysis.

13. Sale, etc., of milk or cream containing antiseptics injurious to health. [Ch. 168, 1895.] Any person who shall sell or offer for sale, or consign, or have in his possession with intent to sell to any person or persons, any milk, cream, butter, cheese, or other dairy products, or who shall deliver to any creamery or cheese factory, milk or cream to be manufactured into butter or cheese, to which boracic acid, salicylic acid, or compounds containing them, or other antiseptics injurious to health, have been added, shall be deemed guilty of a misdemeanor, and upon conviction thereof be punished by a fine of not less than twenty-five nor more than one hundred dollars for each and every offense.

Intent to sell. See note to paragraph 10.

IMITATION BUTTER AND CHEESE.

14. Filled cheese. [Sec. 1, ch. 30, 1895.] No person, by himself or by his agents or servants, shall manufacture, or shall buy, sell, offer, ship, consign, expose or have in his possession for sale any cheese manufactured from or by the use of skimmed milk to which there has been added any fat which is foreign to such milk.

15. Size of skimmed-milk cheese. [Sec. 2, ch. 30, 1895.] No person, by himself or by his agents or servants, shall manufacture, or shall buy, sell, offer, ship, consign, expose or have in his possession for sale, within this state, any skimmed milk cheese, or cheese manufactured from milk from which any of the fat originally contained therein has been removed, except such cheese is ten inches in diameter and nine inches in height.

16. Imitation butter. [Sec. 3, ch. 30, 1895.] No person, by himself or by his agents or servants, shall render or manufacture, sell, ship, consign, offer for sale, expose for sale, or have in his possession with intent to sell, any article, product or compound made wholly or partly out of any fat, oil or oleaginous substance or compound thereof, not produced from unadulterated milk or cream from the same, and without the admixture or addition of any fat foreign to said milk or cream, which shall be in imitation of yellow butter produced from pure unadulterated milk or cream of the same, with or without coloring matter; provided, that nothing in this act shall be construed to prohibit the manufacture or sale of oleomargarine in a separate and distinct form and in such manner as will advise the consumer of its real character, free from coloration or ingredient that causes it to look like butter.

Validity. The foregoing section is almost an exact copy of sec. 1, of ch 5, acts of Massachusetts, 1891. The words "ship, consign," "and without the admixture or addition of any fat foreign to said milk or

cream," found in this section, are not in the Massachusetts act. In Commonwealth v. Huntley, 156 Mass., 236, 30 N. E. Rep., 1127, the question of the validity of the act referred to came before the court. It was an agreed fact that the oleomargarine sold by the defendant was brought to Massachusetts from another state, and was sold there in the original package, and assumed by the court that it was wholesome, palatable and nutritious. The validity of the act, so far as the state constitution was concerned, does not appear to have been questioned. On this branch of the subject, the court quoted from the opinion of the court of appeals of Missouri in the case of State v. Addington, 12 Mo. App., 214, 223, language which had been approved by the supreme court of Pennsylvania in Powell v. Commonwealth, 114 Penn. St., 265, 295, a case which was carried to the supreme court of the United States, and there affirmed, Powell v. Pennsylvania, 127 U. S., 678: "If an article of food is of such a character that few persons will eat it knowing its real character; if, at the same time, it is of such a nature that it can be imposed upon the public as an article of food which is in common use, and against which there is no prejudice; and if, in addition to this, there is probable ground for believing that the only way to prevent the public from being defrauded into purchasing the counterfeit article for the genuine is to prohibit altogether the manufacture and sale of the former, then we think such a prohibition may stand as a reasonable police regulation, although the article prohibited is in fact innocuous, and although its production might be found beneficial to the public, if in buying it they could distinguish it from the production of which it is the imitation." The Massachusetts court also said that "in New Hampshire, Missouri, Minnesota, New York, New Jersey, and Pennsylvania, statutes prohibiting the sale of oleomargarine made in imitation of butter have been upheld by the courts as valid. State v. Marshall, 64 N. H., 549; State v. Addington, 77 Mo., 110; 12 Mo. App., 214; Butler v. Chambers, 36 Minn., 69; People v. Arensberg, 105 N. Y., 123; State v. Newton, 21 Vroom (50 N. J. L.), 534; Powell v. Commonwealth, 114 Penn. St., 265." To the same effect are McAllister v. State, 72 Md., 390; Weideman v. State, 56 N. W. Rep., 688; State ex rel. v. Horgan, 55 Minn., 183. The doubtful question in the Massachusetts case arose under the provision of the constitution of the United States giving to congress power to regulate commerce among the several states. On this point, inasmuch as the statute only applied to oleomargarine which was deceptive, and authorized the sale, under restrictions, of that which was not deceptive, and did not forbid the transportation or storage of the former, a majority of the court held it valid. Commonwealth v. Huntley, 156 Mass., 236; 30 N. E. Rep., 1127.

The ruling of the United States supreme court. The validity of the Massachusetts statute, so far as it was affected by the clause of the federal constitution giving congress power over commerce, came before

the supreme court of the United States in Plumley v. Massachusetts, 155 U. S., 461. It was there held, by a majority of the judges (three dissenting), that the federal statute imposing special taxes upon manufacturers and wholesale and retail dealers in oleomargarine does not restrict the power of the states over the manufacture and sale thereof within their respective limits. "The taxes prescribed by that act were imposed for national purposes, and their imposition did not give authority to those who paid them to engage in the manufacture or sale of oleomargarine in any state which lawfully forbade such manufacture or sale, or to disregard any regulation which a state might lawfully prescribe in reference to that article. . . . Nor was the act of congress relating to oleomargarine intended as a regulation of commerce among the states. Its provisions do not have special application to the transfer of oleomargarine from one state of the union to another. They relieve the manufacturer or seller, if he conforms to the regulations prescribed by congress or by the commissioner of internal revenue, under the authority conferred upon him in that regard, from penalty or punishment so far as the general government is concerned, but they do not interfere with the exercise by the states of any authority they possess of preventing deception or fraud in the sales of property within their respective limits."

The opinion of the court then proceeds to discuss the validity of the statute of Massachusetts as affected by the commerce clause of the federal constitution. "It will be observed," said Justice Harlan, "that the statute of Massachusetts which is alleged to be repugnant to" that clause "does not prohibit the manufacture or sale of all oleomargarine, but only such as is colored in imitation of yellow butter produced from pure unadulterated milk or cream of such milk. If free from coloration or ingredient that causes it to look like butter, the right to sell it 'in a separate and distinct form, and in such manner as will advise the consumer of its real character,' is neither restricted nor prohibited. It appears, in this case, that oleomargarine, in its natural condition, is of a 'light yellowish color,' and that the article sold by the accused was artificially colored 'in imitation of yellow butter.' Now the real object of coloring oleomargarine so as to make it look like genuine butter is that it may appear to be what it is not, and thus induce unwary purchasers, who do not closely scrutinize the label upon the package in which it is contained, to buy it as and for butter produced from unadulterated milk or cream from such milk. The suggestion that oleomargarine is artificially colored so as to render it more palatable and attractive can only mean that customers are deluded, by such coloration, into believing that they are getting genuine butter. If any one thinks that oleomargarine, not artificially colored so as to cause it to look like butter, is as palatable or wholesome for purposes of food as

pure butter, he is, as already observed, at liberty under the statute of Massachusetts to manufacture it in that state or to sell it there in such manner as to inform the customer of its real character. He is only forbidden to practice, in such matters, a fraud upon the general public. The statute seeks to suppress false pretenses and to promote fair dealing in the sale of an article of food. It compels the sale of oleomargarine for what it really is, by preventing its sale for what it is not."

After reviewing many of the cases decided by the supreme court of the United States and relied upon by counsel for the defendant to support his contention that the statute was void, the opinion uses this language: "In none of the above cases is there to be found a suggestion or intimation that the constitution of the United States took from the states the power of preventing deception and fraud in the sale, within their respective limits, of articles in whatever state manufactured, or that that instrument secured to any one the privilege of committing a wrong against society. . . . If there be any subject over which it would seem the states ought to have plenary control, and the power to legislate in respect to which it ought not to be supposed was intended to be surrendered to the general government, it is the protection of the people against fraud and deception in the sale of food products. Such legislation may, indeed, indirectly or incidentally affect trade in such products transported from one state to another state. But that circumstance does not show that laws of the character alluded to are inconsistent with the power of congress to regulate commerce among the states. For, as said by this court in Sherlock v. Alling, 93 U. S., 99, 103: 'In conferring upon congress the regulation of commerce, it was never intended to cut the states off from legislating on all subjects relating to the health, life and safety of their citizens, though the legislation might indirectly affect the commerce of the country. Legislation, in a great variety of ways, may affect commerce and persons engaged in it without constituting a regulation of it within the meaning of the constitution. . . . . And it may be said generally, that the legislation of a state, not directed against commerce or any of its regulations, but relatin to the rights, duties, and liabilities of citizens, and only indirectly and remotely affecting the operations of commerce, is of obligatory force upon citizens within its territorial jurisdiction, whether on land or water, or engaged in commerce, foreign or interstate, or in any other pursuits."

The opinion of the court then proceeds to point out that the case of Leisy v. Hardin, 135 U. S , 100, in which it was held that ardent spirits, distilled liquors, ale and beer, were subjects of exchange, barter and traffic, and, being articles of commerce, their sale while in the original packages in which they are carried from one state to another, could not, without the assent of congress, be forbidden by the state into which they were transported, was not conclusive of the case before it, because

the articles sold in that case were what they purported to be. The opinion of the majority of the court on the Massachusetts statute concluded thus: "We are of opinion that it is within the power of a state to exclude from its markets any compound manufactured in another state, which has been artificially colored or adulterated so as to cause it to look like an article of food in general use, and the sale of which may, by reason of such coloration or adulteration, cheat the general public into purchasing that which they may not intend to buy. The constitution of the United States does not secure to any one the privilege of defrauding the public. The deception against which the statute of Massachusetts is aimed is an offense against society; and the states are as competent to protect their people against such offenses or wrongs as they are to protect them against crimes or wrongs of more serious character. And this protection may be given without violating any right secured by the national constitution, and without infringing the authority of the general government. A state enactment forbidding the sale of deceitful imitations of articles of food in general use among the people does not abridge any privilege secured to citizens of the United States, nor, in any just sense, interfere with the freedom of commerce among the several states."

17. Sale of. [Sec. 4, ch. 30, laws of 1895.] It shall be unlawful for any person to sell or offer for sale to any person who asks, sends or inquires for butter, any oleomargarine, butterine or any substance made in imitation or semblance of pure butter not made entirely from the milk of cows, with or without coloring matter.

18. Notice of sale of oleomargarine, etc. [Sec. 5, ch. 30, laws of 1895.] It shall be unlawful for any person to expose for sale oleomargarine, butterine, or any similar substance not marked and distinguished on the outside of each tub, package or parcel thereof by a placard with the word "oleomargarine," and not having also upon every open tub, package or parcel thereof a placard with the word "oleomargarine," such placard in each case to be printed in plain, uncondensed gothic letters not less than one inch long, and such placard shall not contain any other words thereon.

Provision valid. See note to paragraph 16. A statute which provides that no person shall sell any lard, or any article intended for use as lard, which contains any ingredient but the pure fat of healthy swine, under any label bearing the words "refined," "pure," "family," unless

every package in which the article is sold is marked "compound lard," has been sustained as valid by the supreme court of Iowa. State v. Snow, 47 N. W. Rep., 777.

In Minnesota a statute which makes it a misdemeanor to manufacture for sale within that state, or to sell or offer to do so, baking powder containing alum, unless each package thereof is labelled, "this baking powder contains alum," has been sustained. Stoltz v. Thompson, 46 N. W. Rep., 410.

In Ohio it has been held that it is "within the undoubted power of the legislature to prohibit the sale of substances having the semblance of butter or cheese, but not wholly made from pure cream or milk, unless each package of such substance should have printed, stamped or marked thereon in the manner prescribed by the statute, the name of each article used in, or entering into, the composition of such substance, and this power is possessed by the legislature over the sale of articles protected by letters patent as well as of those not protected." Palmer v. State, 39 Ohio St., 237.

19. Same, notice, how given. [Sec. 6, ch. 30, laws of 1895.] It shall be the duty of every person who sells oleomargarine, butterine, or any similar substance, from any dwelling, store, office or public mart, to have conspicuously posted thereon the placard or sign, in letters not less than four inches in length, "oleomargarine sold here," or "butterine sold here." Such placard shall be approved by the dairy and food commissioner of the state of Wisconsin.

20. Notice of sale from vehicles. [Sec. 7, ch. 30, laws of 1895.] It shall be unlawful for any person to peddle, sell or deliver from any cart, wagon or other vehicle, upon the public streets or ways, oleomargarine, butterine, or any similar substance, not having on the outside of both sides of said cart, wagon or other vehicle the placard in uncondensed gothic letters, not less than three inches in length, "licensed to sell oleomargarine."

This section is not in the exact words of sec. 4, ch. 412, acts of Mass., 1891, though it is modeled after it. That act does not use the words "on the outside of both sides," etc., but contained the phrase "on both sides of the vehicle." It was held that placing the placards on the inside of the cover of the wagon, which was open at both ends, was not a compliance with the law. It was also ruled that the statute was not

in conflict with the act of congress authorizing the licensing of the sale of oleomargarine. Commonwealth v. Crane, 158 Mass., 218; 33 N. E. Rep., 383.

21. Notice to guests at hotels, etc. [Sec. 8, ch. 30, 1895.] It shall be unlawful for any person to furnish, or cause to be furnished, in any hotel, boarding house, restaurant, or at any lunch counter, oleomargarine, butterine, or any similar substance to any guest or patron of said hotel, boarding house, restaurant or lunch counter, without first notifying such guest or patron that the substance so furnished is not butter,

See notes to secs. 16, 18, 20. This section is similar to sec. 5, ch. 412, Mass. acts, 1891.

22. Penalties. [Sec. 9, ch. 30, 1895.] Any person who shall violate any of the provisions of this act shall be guilty of a misdemeanor, and upon conviction thereof shall be punished for the first offense by a fine of not less than fifty dollars nor more than five hundred dollars; and upon conviction of any subsequent offense shall be punished by a fine of not less than one hundred dollars or more than five hundred dollars, or by imprisonment in the county jail of not less than ten days nor more than sixty days, or by both such fine and imprisonment, at the discretion of the court.

23. Duty of district attorneys — Special counsel. [Sec. 10, ch. 30, laws of 1895.] It shall be the duty of the district attorney in any county of the state, when called upon by the dairy and food commissioner of this state, or any of his assistants, to render any legal assistance in his power to execute, and to prosecute the cases arising under the provisions of this act; and the dairy and food commissioner shall have power to appoint, with the approval of the governor, special counsel to prosecute or to assist in the prosecution of any case arising under the provisions of this act.

24. Butter and cheese, use of in state institutions. [Sec. 7, ch. 165, laws of 1891.] No butter or cheese not made wholly and directly from pure milk or cream, salt

and harmless coloring matter shall be used in any of the charitable or penal institutions of the state.

25. Penalty. [Sec. 8, ch. 165, laws of 1891.] Any person or persons violating any of the provisions or sections of this act, shall, upon conviction thereof, be fined not less than twenty-five nor more than fifty dollars for the first offense, or for each subsequent offense not less than fifty nor more than one hundred dollars, or be imprisoned in the county jail not less than ten nor more than ninety days or both.

26. Disposition of fines. [Sec. 9, ch. 165, laws of 1891.] One-half of all the fines collected under the provisions of this act shall be paid to the person or persons furnishing information upon which conviction is procured.

The other sections of ch. 165, laws of 1891, are believed to be superseded by ch. 228, laws of 1893, paragraphs 27-32.

BRANDING CHEESE, ETC.

27. Sale of falsely branded. [Sec. 1, ch. 228, laws of 1893.] No person shall offer for sale, sell, ship or consign cheese labeled with a false brand or label as to the quality of the article.

28. Uniform brand. [Sec. 2, ch. 228, laws of 1893.] The state dairy and food commissioner is hereby authorized and directed to issue to the cheese manufactories of the state, upon proper application therefor and under such regulations as to the custody and use thereof as he may prescribe, a uniform stencil or brand, bearing a suitable devise or motto and the words "Wisconsin full cream cheese."

29. Brand, how used—Registration of factories. [Sec. 3, ch. 228, laws of 1893.] Every brand issued shall be used upon the side of the cheese on the bandage thereof, also

upon the package containing the same, and shall bear a different number for each separate manufactory, and the commissioner shall keep a book in which shall be registered the name, location and number of each manufactory using the said brand, and the name or names of the persons at each manufactory authorized to use the same.

30. Fraudulent use of brand. [Sec. 4, ch. 228, laws of 1893.] It shall be unlawful to use or permit such brand to be used upon any other than full cream cheese, or package containing the same.

31. Brand for skimmed cheese. [Sec. 5, ch. 228, laws of 1893.] Every person who shall, at any cheese factory in the state, manufacture skimmed cheese, shall distinctly and durably stamp upon each and every such cheese, and upon the box, the words "Wisconsin skimmed cheese." All cheese not manufactured as in sections 1, 2, 3 and 4, of this act, shall be deemed to be skimmed cheese under the provisions of this act. The brand herein provided by this section of this act, for designating the grade and quality of cheese provided by this section shall be such as to produce an impression not less than three inches in width and five inches in length, and shall be in full-faced capital letters of as large size as the space hereby provided for will permit, and the whole to be included within a plain, heavy border. Ordinary stamping ink, either red, green or violet in color, and of such composition as not to be easily removed or wholly obliterated by moisture, shall be used in stamping as provided for by this section.

So far as the act of 1893 relates to branding skimmed cheese, it is probably superseded by that part of ch. 30, 1895, embodied in paragraph 15. The provisions of the act of 1893, relating to branding full cream cheese, are in force, and supersede ch. 165, 1891.

32. Penalty—Disposition of fine. [Sec. 6, 228, laws of 1893.] Whoever violates the provisions of this act shall be deemed guilty of a misdemeanor and for each and every package so falsely branded or omitted to be branded as herein provided, shall be punished by a fine of not less

than twenty-five nor more than fifty dollars, one-half of which shall be paid to the person or persons furnishing the evidence upon which such conviction is made.

CLEANLINESS OF FACTORIES AND CONDEMNATION OF IMITATION DAIRY PRODUCTS.

33. Powers of dairy and food commissioner. [Sec. 1, ch. 257, laws of 1895.] The dairy and food commissioner or his agents shall have full access and ingress to any factory or building where any product of the dairy is manufactured or stored for sale or shipment of the same, and shall be empowered to enforce such measures as may be necessary for the perfect cleanliness of said factories, buildings and surroundings, also for the cleanliness of all the utensils necessarily used in the manufacture and general handling of the dairy product. Any person refusing the privilege of such access to the dairy and food commissioner or his agent, or opposing him in any way shall be considered as having committed a misdemeanor.

34. Warrant for seizure of imitation products. [Sec. 2, ch. 257, laws of 1895.] When complaint shall be made on oath to any magistrate authorized to issue warrants in criminal cases, that imitation butter or imitation cheese or any substance designed or intended to be used as a substitute for butter or cheese, is in the possession or under the control of any person or persons contrary to the provisions of law of this state, and that the complainant believes that it is concealed in any particular warehouse, store or refrigerator for mercantile purposes, the magistrate, if he be satisfied that there be cause for such belief, shall issue a warrant for such property.

35. Terms of the warrant. [Sec. 3, ch. 257, laws of 1895.] All such warrants shall be directed to the sheriff of the county or his deputy or to any constable of the county, commanding such officer to search the house, building, store or other place where the imitation butter or imita-

tion cheese or any substance designed or intended to be used as imitation butter or cheese for which he is required to search is believed to be concealed, which place and property to be searched for shall be designated and described in the warrant, and to bring such property when found and the person or persons in whose possession the same shall be found before the magistrate who issued the warrant or before some other magistrate or court having cognizance of the case.

36. Preservation, analysis and confiscation of property. [Sec. 4, ch. 257, laws of 1895.] When any officer in the execution of a search warrant under the provisions of this act shall find any imitation butter or cheese, or any substance designed or intended to be used as an imitation for butter or cheese and for which a search is allowed by this act, all the property so seized shall be safely kept by the direction of the court or magistrate, so long as shall be necessary for the purpose of being produced as evidence on any trial; provided, that it shall be the duty of the officer who serves a search warrant issued for imitation butter or imitation cheese or any substance designed or intended to be used as imitation for butter or cheese and alleged to be in his possession or under the control of any person or persons contrary to law, to deliver to the state dairy and food commissioner, or to any person by such commissioner authorized in writing to receive the same, a true and perfect sample of each article seized by virtue of such warrant, for the purpose of having the same analyzed. If any sample be found to be imitation butter or imitation cheese, or substance designed or intended to be used as an imitation for butter or cheese and that the same, at the time of such seizure, was in the possession or under the control of any person or persons contrary to any of the provisions or requirements of this act, then and in such case the property so seized shall be confiscated and destroyed, under the direction of the court or magistrate; otherwise the same shall be forthwith returned to the person or persons from whom it was taken.

37. Penalty. [Sec. 5, ch. 257, laws of 1895.] Any person or persons violating any of the provisions or sections of this act shall be guilty of a misdemeanor and upon conviction thereof be fined not less than twenty-five nor more than fifty dollars for the first offense, and for each subsequent offense not less than fifty nor more than one hundred dollars or to be imprisoned in the county jail not less than thirty nor more than ninety days in the discretion of the court before whom such conviction may be had.

38. Disposition of fines. [Sec. 6, ch. 257, laws of 1895.] One-half of all fines collected under the provisions of this act shall be paid to the person or persons furnishing information upon which conviction is procured.

FRAUD IN DAIRY FACTORIES.

39. Penalty. [Sec. 1494a, R. S.] Any butter or cheese manufacturer who shall knowingly use, or allow any of his employes or any other person to use for his or their own individual benefit, any milk, or cream from the milk, brought to said butter or cheese manufacturer, without the consent of all the owners thereof, or any butter or cheese manufacturer who shall refuse or neglect to keep, or cause to be kept, a correct account (open to the inspection of any one furnishing milk to such manufacturer) of the amount of milk daily received, or of the number of pounds of butter, and the number and aggregate weight of cheese made each day, or of the number cut or otherwise disposed of, and the weight of each, shall for each and every offense forfeit and pay a sum not less than twenty-five dollars, nor more than one hundred dollars, to be recovered in an action in any court of competent jurisdiction, one-half for the benefit of the person or persons, firm or association, or their assigns, upon whom such fraud or neglect shall be committed, first having made complaint therefor, the remainder to the school fund.

ADULTERATION OF FOOD, DRUGS, LIQUORS, ETC.

40. Adding injurious substances to food, etc. [Sec 1, ch. 248, laws of 1879.] No person shall mix, color, stain, powder, order or permit any other person to mix, color, stain or powder any article of food with any ingredient or material so as to render the article injurious to health, with intent that the same may be sold in that condition. And any person that shall sell any such article so mixed, colored, stained or powdered, shall be subjected to a penalty in each case not exceeding a fine of fifty dollars for the first offense, and for a second offense shall be punished by imprisonment in the state prison for a period not exceeding one year, with hard labor.

As to the analysis of articles purchased under chapter 248, laws of 1879, (paragraphs 40–43), see paragraph 57.

41. Same as to drugs. [Sec. 2, ch. 248, laws of 1879.] No person shall, except for the purpose of compounding, as hereinafter described, mix, color, stain or powder, or permit any other person to mix, color, stain or powder, any drug with any ingredient or material so as to affect injuriously the quality or potency of such drug, with intent that the same may be sold in that condition. And any person who shall sell any such drug so mixed, colored, stained or powdered shall be liable to the same penalty or punishment in each case respectively, as in the preceding section, for a first and subsequent offense; provided, that no person shall be liable to be convicted under the foregoing section of this act, in respect to the sale of any article of food or of any drug, if he shows to the satisfaction of the justice or court before whom he is charged that he did not know of the article or drug sold by him being so mixed, colored, stained or powdered, as in that section mentioned, and that he could not, with reasonable diligence,

have obtained that knowledge; or that such mixing, coloring, staining or powdering was required for the production, extraction, preparation, preservation, consumption or transportation as an article of commerce in a state fit for carriage; or where the drug or food is supplied in the state required by the specification of the patent in force; or that the food or drug was unavoidably mixed with some extraneous matter in process of collection or preparation.

Sec. 4601, R. S., is probably superseded by the above. It was there provided that "any person who shall fraudulently adulterate for the purpose of sale, any drug or medicine, in such a manner as to render the same injurious to health, shall be punished by imprisonment in the county jail not more than one year, or by fine not exceeding three hundred dollars." See paragraphs 44, 45.

42. False labeling of food, drugs, etc. [Sec. 3, ch. 248, laws of 1879.] Every person who shall compound or put up for sale any food, drug or liquor, in casks, boxes, bottles or packages, with any label, mark or device whatever, so as and with intent to mislead or deceive as to the true name, nature, kind and quality thereof, shall be liable to a penalty of not to exceed five hundred dollars for the first offense, and for every offense after the first offense shall be punished by imprisonment in the state prison for not less than one year nor more than ten years.

The penalty imposed by this section for a first offense may be collected in a civil action brought by the state. Such offense is not a misdemeanor, nor the penalty provided for a fine within section 3294, R. S. State v. Grove, 77 Wis., 448.

It is held in New York that "there is no rule of law which requires the plaintiff in a civil action, when a judgment against the defendant may establish his guilt of a crime, to prove his case with the same certainty which is required in criminal prosecutions. Nothing more is required in such cases than a just preponderance of evidence, always giving the defendant the benefit of the presumption of innocence." New York & Brooklyn Ferry Co. v. Moore, 102 N. Y., 667, fully reported in 18 Abb. N. C., 106. It is held in a late case, brought by the dairy commissioner of that state to recover the penalty fixed by the act to prevent deception in the sale of dairy products, that the rule "stated is the proper one applicable to the measure of evidence in civil actions, and such seems to be the weight of authority. (See cases collected in

note to Sprague v. Dodge, 95 Am. Dec., 525.) And there is no apparent reason for making any distinction in that respect in behalf of a defendant in an action for a penalty, in which the people are the party plaintiff. It is no less a civil action because so brought. The purpose of the action, is not the punishment of the defendant in the sense legitimately applicable to the term, but such action is brought to recover the penalty as a fixed sum by way of indemnity to the public for the injury suffered by reason of the violation of the statute. The effect of the recovery is merely to charge the defendant with pecuniary liability, while a criminal prosecution is had for the purpose of punishment of the accused." People v. Briggs, 114 N. Y., 56, 65.

43. Definitions. [Sec. 4, ch. 248, laws of 1879.] The term "food" as herein used shall include every article used for food or drink by man, other than drugs. The term "drug" shall include medicine for internal or external use.

44. Adulteration of liquors, candies, etc. [Sec. 4600, R. S.] Any person who shall fraudulently adulterate, for the purpose of sale, any substance intended for food, or any wine, spirits, malt liquor, or other spirituous liquors, or any other fluid, intended for drinking, or any candy or sweetmeat, with any substance, coloring matter, or anything poisonous, deleterious or injurious to health, or who shall knowingly manufacture, sell, or offer for sale, any such adulterated food, liquor, candy or sweetmeat, shall be punished by imprisonment in the county jail not more than six months, or by fine not exceeding one hundred dollars, and any article so adulterated shall be forfeited and destroyed.

The provisions of this section so far as they relate to food, are probably superseded by sections of the act of 1879, found in paragraphs 40, 43.

45. Liability of druggists for quality of drugs, etc. [Sec. 13, ch. 167, laws of 1882, as amended by sec. 11, ch. 227, laws of 1895.] Every owner or conductor of a drug store shall be responsible for the quality of all drugs, chemicals or medicines, sold or dispensed by him, except those sold in the original package of the manufacturer, and except those articles known as patent or proprietary medicines. And should any owner or conductor of a store

intentionally and fraudulently adulterate, or cause to be adulterated, any drugs, chemicals or medical preparations sold in such store, he shall, for any and every such offense forfeit the sum of one hundred dollars, and if such person shall be a registered pharmacist, or a registered assistant pharmacist, his registration and certificate of registration may be, by said board [state board of pharmacy] revoked and annulled; whereupon such person shall cease to be a registered pharmacist or registered assistant pharmacist.

46. Adulterated honey, marking of. [Sec. 2, ch. 40, laws of 1881.] Every person, company or corporation, who shall sell or offer for sale, honey, or any imitation of honey, which is adulterated with glucose, or any other substance, shall mark the package or parcel with the words "adulterated honey," as required by section one of this act.

Section 1, of chapter 40, laws of 1881, related to the manufacture of imitation butter, and provided that each firkin, tub, package or parcel thereof, should be marked on top of same in letters not less than one-half inch in length, and breadth in proportion, and in such manner that it may be plainly seen. As applied to butter the said section was repealed by chapter 361, laws of 1885. Section 3, of the act of 1881, related to imitation cheese. It was also repealed by the act of 1885.

47. Penalty. [Sec. 4, ch. 40, laws of 1881.] Any person found guilty of any violation of this act, shall for each offense be punished by imprisonment in the county jail not less than ten days nor more than six months, or by a fine of not less than ten dollars nor more than one hundred dollars, or both, in the discretion of the court.

48. Fines, how disposed of. [Sec. 5, ch. 40, laws of 1881.] One-half of all fines imposed by the enforcement of this act shall be paid to the person who informs against and prosecutes such offender to conviction.

49. Imitation cider vinegar. [Sec. 1, ch. 394, laws of 1891.] Every person who manufactures for sale, or offers or exposes for sale, as cider vinegar, any vinegar not the legitimate product of pure apple juice, known as apple cider, or vinegar not made exclusively of said apple cider,

or vinegar into which foreign substances, drugs or acids have been introduced, as may appear by proper tests, shall be deemed guilty of a misdemeanor.

50. Adding injurious ingredients to vinegar. [Sec. 2, ch. 394, laws of 1891.] Every person who manufactures for sale, or offers for sale, any vinegar, found, upon proper tests, to contain any preparation of lead, copper, sulphuric acid, or other ingredient injurious to health, shall be deemed guilty of a misdemeanor.

51. Adulteration and false labeling of vinegar. [Sec. 3, ch. 394, laws of 1891.] No person, by himself, his servant or agent, or as the servant or agent of any other person, shall sell, exchange, deliver, or have in his custody or possession, with intent to sell or exchange, or expose or offer for sale or exchange, any adulterated vinegar, nor shall he label, brand or sell as cider vinegar, or as apple vinegar, any vinegar not the legitimate product of pure apple juice, or not made exclusively from apple cider.

52. Standard of pure vinegar; marking of. [Sec. 4, ch. 394, laws of 1891.] All vinegar shall have an acidity equivalent to the presence of not less than four per cent. by weight, of absolute acetic acid, and, in the case of cider vinegar, shall contain in addition not less than two per cent. by weight, of cider vinegar solids upon full evaporation over boiling water at 212°; and if any vinegar contains any artificial coloring matter injurious to health, or less than the above amount of acidity, or in the case of cider vinegar, if it contains less than the above amount of acidity or of cider vinegar solids, it shall be deemed adulterated within the meaning of this act. All manufacturers of vinegar in the state of Wisconsin, and all persons who reduce or re barrel vinegar in this state, and all persons who handle vinegar in lots of one barrel or more, are hereby required to stencil or mark in black figures at least one inch in length on the head of each barrel of vinegar bought or sold by them, the standard strength of the vinegar contained in the package or barrel, which shall be

denoted by the per centum of acetic acid. And any neglect so to mark or stencil each package or barrel, or any false markings of packages or barrels, shall be deemed a misdemeanor.

It is competent for the legislature to make it a misdemeanor to add artificial coloring matter to vinegar, regardless of whether the matter added is injurious to the health of the consumer or not. People v. Girard, 73 Hun (N. Y.), 457.

53. Penalty for violation of law. [Sec. 5, ch. 349, laws of 1891.] Whoever violates any of the provisions of this act shall be deemed guilty of a misdemeanor and shall be punished by a fine not less than ten nor more than one hundred dollars and costs.

54. Sale of unwholesome provisions. [Sec. 4599, R. S.] Any person who shall knowingly sell any kind of diseased, corrupted or unwholesome provisions, whether for meat or drink, without making the same fully known to the buyer shall be punished by imprisonment in the county jail not more than six months, or by fine not exceeding one hundred dollars.

55. Sale, etc., of flesh of diseased animals. [Ch. 431, laws of 1891.] Chapter 187 of the revised statutes is hereby amended by incorporating therein a section to be known as section 4607g of said revised statutes, and to read as follows: Section 4607g. It shall be unlawful for any person to sell or expose for sale, or to give away for the purpose of food, or to can or pack for the purpose of transportation and sale to other markets any unwholesome, stale, emaciated, blown, tainted, putrid or measly meat or the flesh of any diseased animal or of any animal that shall not have been slaughtered for the purpose of food, knowing or having good reason to believe that such meat is unwholesome, stale, emaciated, blown, tainted, putrid or measly, or that such flesh is the flesh of a diseased animal or of an animal that shall not have been slaughtered for the purpose of food. It shall be unlawful for any person or corporation owning or operating any slaughter house or packing establishment within the state of Wisconsin, to

receive for the purpose of killing or to kill any diseased animal, or to render the carcass of any animal that shall have died by disease or through exposure, or that shall not have been butchered for food, knowing or having good reason to believe that such animal or animals were diseased or had died from disease or exposure, or that the same shall not have been butchered for food. Any person found guilty of any violation of this act, shall for each offense be punished by imprisonment in the county jail not less than ten days nor more than six months, or pay a fine of not less than ten dollars nor more than one hundred dollars, or both in the discretion of the court.

56. Coloring grain. [Sec. 4606, R. S.] Any person who shall fumigate any barley, wheat, or other grain, by the use of sulphur or other substance, or shall in any way or by the use of any chemical, material or process, affect the color or healthfulness of such grain, or who shall sell or offer for sale any such grain, knowing that the same has been so fumigated, or the color or healthfulness thereof so affected, shall be punished by imprisonment in the county jail not more than one month, or by fine not exceeding fifty dollars.

Affect the color. See note to paragraph 52.

OF THE ANALYSIS OF FOOD, DRUGS AND LIQUORS.

57. State analyst, appointment of. [Sec. 1, ch. 252, laws of 1880.] The governor of the state shall appoint one of the professors of the state university of sufficient competence, knowledge, skill and experience, as state analyst, whose duty it shall be to analyze all articles of food and drink, and all drugs and liquors manufactured, sold or used within this state, when submitted to him as hereinafter provided. The term of office of such analyst shall be three years from his appointment, unless sooner removed by the appointing power, and his compensation

shall not exceed two hundred dollars, in addition to his annual salary as professor, and shall be paid by the board of regents of the state university from the university fund.

58. Who may submit articles for analysis. [Sec. 2, ch. 252, laws of 1880.] The state board of health and vital statistics, medical officers of health, inspectors of weights and measures, boards of supervisors of any town, boards of trustees of any village, aldermen or common council of any city in this state, or a majority of said corporate bodies, may at the cost of their respective corporations, purchase a sample of any food, drugs or liquors offered for sale in any town, village or city in this state, in violation of sections number one, two and four of chapter two hundred and forty-eight of laws of A. D. 1879 paragraphs 40–43, ante], or if they have good reasons to suspect the same to have been sold, or put up for sale, contrary to the provisions of said chapter two hundred and forty-eight, may submit the same to the state analyst as hereinafter provided, and the said analyst shall, upon receiving such article duly submitted to him, forthwith analyze the same, and give a certified certificate to such person or officer submitting the same, wherein he shall fully specify the result of the analysis.

59. Articles to be sealed. [Sec. 3, ch. 252, laws of 1880.] Any person purchasing any article with the intention of submitting it to an analysis, shall, after the purchase shall have been made and completed, forthwith notify the seller or his agent selling the same, of his or their intention to have the same analyzed by the state analyst, and shall offer to accompany the seller or his agent with the article purchased to the town, village or city clerk of the place in which the article was bought, and shall forthwith remove the article purchased to the office of said clerk, and in the presence of the seller or his agent, if present, divide said article into two parts, each to be marked, fastened and sealed up in such a manner as its nature will permit. The said clerk shall forthwith forward

one part to the state analyst by mail, express or otherwise, as he shall elect, and shall retain the other part or package subject to the order of any court in which proceedings shall thereafter be taken. The certificate of the state analyst shall be held in all the courts of this state as prima facie evidence of the properties of the articles analyzed by him.

60. Refusing to sell articles for analysis. [Sec 4, ch. 252, laws of 1880.] If any person applying to purchase any article of food, drug or liquor exposed for sale or on sale by retail on any premises in any town, village or city in this state, and shall tender the price of the quantity which he shall want, for the purpose of analyzing, not being more than shall be reasonably required, and the person exposing the same for sale shall refuse to sell the same, such person so refusing to sell shall be liable to a penalty not exceeding fifty dollars.

61. Analyst's report. [Sec. 5, ch. 252, laws of 1880.] The state analyst shall report to the state board of health and vital statistics the number of all the articles analyzed, and shall specify the results thereof to said board annually, with full statement of all the articles analysed and by whom submitted.

62. State board of health may submit articles. [Sec. 6, ch. 252, laws of 1880.] The state board of health and vital statistics may submit to the state analyst any samples of food, drugs or drink for analysis, as hereinbefore provided

TRANSACTIONS

WITH

ACCOMPANYING PAPERS AND DISCUSSIONS,

OF THE

WISCONSIN DAIRYMEN'S ASSOCIATION,

AT THEIR

TWENTY-THIRD ANNUAL CONVENTION,

Held at New London, Wis., Februrary 13th, 14th, and 15th, 1895.

The twenty-third annual meeting of the Wisconsin Dairymen's Association was held at the Auditorium, New London, Wisconsin, February 13th, 14th, and 15th, 1895.

The opening session convened at one o'clock, President Everett in the chair.

President Everett—The outlook seems favorable for a good convention. The clouds have cleared away and the weather is fair again, we are convened in a warm-hearted city, we shall be here with you for three days. We have come together to rest from the labors of the farm and the factory and to brighten up the intellect a little, rub against each other, exchange ideas and thereby become better dairymen, as well as better men and women.

ADDRESS OF WELCOME.

Hon. R. S. Johnson.

Mr. Chairman, Gentlemen of the Dairymen's Association of the State of Wisconsin:—I left my labors at Madison, that I might be present here today to speak words of welcome to those farmers who have sought a respite from the never ending toils of life to meet here in gladness and in congratulation, mindful of the blessings that you might receive in this, your school of instruction, that I might speak words of welcome to the distinguished guests who have come from different portions of our state to give to you at this time the benefit of their knowledge and of their observation. This convention, convened under the most favorable auspices, is to the people of this community and the farmers of these counties, a matter today, worthy of our welcome and our congratulation.

History recites among other things that the Hebrews used butter as a food, but the Greeks and the Romans used it only as an ointment in their baths. Today in France and Italy and Spain it is sold by the apothecaries as a medicinal agent for external application. In Europe and Asia cheese is made from the milk of the buffalo; the travelers of Lapland commend the cheese made from the milk of the reindeer. In Germany its people admire its Limburger and it is to be regretted that this grand commonwealth should recognize in the least the product of the filled cheese. Vera non verba should be our maxim today; "truth, not words," should be the tribute of this convention and of all people to pure products, looking towards legislature to make laws that will protect this grand industry.

The county of Waupaca, comprising an area of 648 square miles, Outagamie county, comprising the same area, today have been robbed of all that which nature gave to them,—its timber. It now devolves upon you husbandmen of the soil to produce from that soil the greatest amount in a money sense that you can for your benefit. In conclusion I can but say as a matter of welcome to those of you who have gathered here, you will

find the people of this city the most hospitable, you will find its streets beautiful, you will find here palatial residences, you will find substantial mercantile establishments and manufacturing enterprises.

We hope that in all your deliberations it will be to the wise end and for the interests of the Dairymen's Association.

RESPONSE TO ADDRESS OF WELCOME.

C. P. Goodrich, Ft. Atkinson.

Mr. President, Citizens of New London, and your Representative:—On behalf of the Dairymen's Association and partly for myself, I really think that I owe an apology. I don't believe in apologies as a rule. I came here expecting, among other things, to listen to a response by Ex-Gov. Hoard, but he is not here. Now, I wish to say to you I never expected to be governor. I never expected to be ex-governor, but I tell you, my friends, I feel now as though I was getting that way. I have got into the tracks of an ex-governor, and now I don't know but you will be marking your ballots with a cross opposite an old dairyman's name in two years from now. You needn't do it unless you are a mind to.

In behalf of the Dairymen's Association I wish to thank the people of New London and their representative for this cordial, earnest and eloquent address of welcome, but we knew beforehand that we would be welcome, we knew enough about the citizens of New London to know that they would welcome the Dairymen's Association, and there is a little pride in it when I ask, why shouldn't we be welcome anywhere in the state of Wisconsin? When I travel through this state, even going at a rapid rate, on an express train, and I look out of the windows of the car, I can tell every time when I am passing through the dairy districts. Why? On account of the indisputable evidence of thrift and prosperity that I see in the way of fine barns, in well painted houses, and in the summer time

cultivated fields and splendid crops, saying nothing about the beautiful dairy cows. Then, I say to myself, "The dairyman has been the man who is doing more to build up the state of Wisconsin than any other class of men, and the Dairymen's Association has stood at their back and led them on." So I say, why not feel some pride in it? You may think this is boasting, but I can't help it. I do feel a pride in the work that the Dairymen's Association has done. I do feel a pride in the work that the dairymen are doing, and if you want to pursue your investigations further than to take a glance over the field, to know whether dairying has been prosperous or not, you go into the business houses, go into the banks, as I do. I go in and I say, "What farmers are depositing money with you? Do any of them?" "Oh, yes, there is a million dollars deposited in our banks of their money." Then I say, "what class of farmers are they,—grain raisers, tobacco men, dairymen, or what?" "It is the dairymen every time." Who is borrowing money, mortgaging their places?" "It is the tobacco men and the grain raisers, they are borrowing the money that the cow gave to the dairymen."

I did not get up here to make a speech, only just to say that we are thankful for this warm welcome, and now I will say in the words of a man that I used to hear of at meeting when I was a young man,—I used to go to church then,—and one man always used to get up and talk, and he always made the same speech every week in the year, fifty-two times in the year, and I don't know how many years, and the speech was always just like this: "I am glad I am here. I think it is good for I to be here."

President Everett was introduced by Mr. Johnson, and read his annual address as follows:

PRESIDENT'S ADDRESS.

At this opening session of the 23d annual convention of the Wisconsin Dairymen's Association, I desire to congratulate you and the dairymen of Wisconsin upon this happy combination of dairy intelligence.

It means more to us than the good time we are going to have during this convention. We have come together at this time and in this place, for a clear and distinct purpose. While we appreciate the hearty welcome that has been extended to us and while we shall have fun without stint, and enjoy your hospitality as only dairymen know how to enjoy and appreciate the good things of life, yet the real purpose for which this association has met in convention annually for twenty-three years, is to raise the standard of dairying in Wisconsin.

This association has labored all of these years with a oneness of purpose, with a united effort and with perfect harmony to accomplish this purpose. The great good that has been accomplished through this organized effort and the prosperity it has brought to the people of Wisconsin, financially, intellectually and socially, are facts that have passed into the history of our state.

I could not in this short address begin to enumerate the many benefits that have come to the common people through the untiring efforts and wise counsels that have characterized this association from its very inception; and while we fully appreciate the good work that has been done, and have a high regard for the officers and members of this Association that have done so much and often at great personal sacrifice for the building of this great industry, yet we must needs be remindful that we have the future to deal with. We can draw many valuable lessons from the past; every failure made, as well as every success that has been achieved, is to the intelligent man food for thought, and a lesson for profit. Our purpose today is to solve the problems so far as possible that confront us, and they are not few.

Wisconsin is a great dairy state, because of a good climate, a naturally fertile soil that grows the best of grass and other necessary crops. We have pure water in abundance, lumber with which to build economically for the comfort of our animals, and a near market for the product of the dairy. But this is not enough. No matter how excellent our natural resources, no matter how perfect the dairy cow, or how near and good the market, without a clear comprehension and understanding of

the principles that underlie successful dairying, a high mark will never be reached.

I tell you, gentlemen, the one thing we need to do today as much as we ever did, and the one thing we will always need to do, is to fertilize the mind. No matter what business a man may be engaged in, his success is measured by his intellect, his income is commensurate with the intelligence and energy put forth.

In Wisconsin we are fortunate in the possession of many bright, successful dairymen, and yet we have a great multitude of men who need the influence of this dairy enlightenment. We have an element of ignorance, of willful stupidity, of selfishness and dishonesty, to contend with and overcome. There is no time to rest, and I hope and believe this Association will never cease its efforts, and will never lay down its heavy burden until every man in Wisconsin who keeps a cow and makes a pound of poor butter or cheese, shall make confession and come into the circle of good fellowship and dairy wisdom that he may be saved.

For the past two years our country has been suffering from distressed financial circumstances. Added to this came the extended drought last summer with its terrible, withering effects, and in our own state fires have destroyed lives and property. Times are hard. In sections of our country the people are suffering from cold and hunger, money is scarce and many are unable to meet their obligations. Honest, industrious people cannot get work to do and have not the means with which to purchase butter or cheese at any price. Owing to this state of affairs, and because the product of the cow has to compete with fraud and deception in the market, the price of dairy products has been lower during the past two years than for many years previous.

I do not look for high prices again for some time to come. Our only outlet for butter is the home market. We can not hope to compete with Australia, Denmark and the grass butter of New Zealand, in the British market. Our reputation abroad for cheese is not of the best, and it will be some time before we can recover our lost ground and again face the people of the world with an honest purpose, but when we shall

again make nothing but good cheese, and can knock at the doors of foreign markets with clean hands and a pure article, may we look for better prices, and when that time comes we shall have a good home market for our cheese. When we make butter and cheese of first quality, and nothing else, we will have a good market for all we can produce.

There are three questions of importance for us to consider at this time:

How can we cheapen the cost of production?

How can we make a better article?

What can we do to influence the market end of our business?

I want you to consider these questions with your best thought, for they all mean more economy. The successful dairyman is always striving to reduce the cost of production. That is the secret of success in all kinds of business. Economy is not narrowness, but it is wisdom, it shows breadth of mind.

The man who can cheapen the cost of the cow's ration two cents per day and get the same result, or if he can so feed her without extra cost that she will produce three pounds more milk per day, he adds to his net income. That is true economy, and the man who can tell us how to do it is a benefactor.

There are many perplexing things coupled with this second question of economy—How to produce a better article. It involves the whole business from the feed bin to the butter firkin and curing room.

We are in this section of the state today to help the cheese industry. The making of fine cheese requires a great deal of intelligent care, first, on the part of the farmer, and then through the skill of the maker. I hope to see the time when every cheese maker in the state, will be a graduate of some dairy school, and when our cheese instructors will be educated to the very highest point of excellence. But the producer of milk must remember that good butter or cheese was never made from poor milk, and when all of our farmers understand this fact and act accordingly, they will be in the line of economy, because the product will be improved in quality.

Some of our farmers should understand that good cheese was never made, and never will be made, from skim milk and neutral oil. When I think of this great state, full of intelli-

gence, the finest dairy school in the world, wherein men are being educated to the highest possible degree in the science of dairying, from beginning to end, fortunate in the possession of the very best dairy scientists, with a splendid system of institute work, one of the most powerful dairy associations in America, no lack of good agricultural and dairy papers, and all these combined forces working towards the same result, straining every nerve to build up this great industry that brings into our state more than thirty millions of dollars annually—to know all this, and to know what it has cost, then to have to stand quietly by and see a few farmers sell skim milk for twelve cents a hundred to go into filled cheese, it is exasperating, to say the least. While I cannot find words that will fully express my disgust and feelings towards the man that will make filled cheese, yet he is not alone to blame, for the farmer that will willfully follow such delusion, and become associated with the cheapest kind of all folly, that which knocks the foundation out from under his own prosperity, is deserving of severe criticism. There is no possible excuse for a man that will sell skim milk for fifteen cents per hundred, because it is worth from to twenty-five to thirty-five cents per hundred pounds to feed to growing hogs. A man is very neglectful of his own interests when he will throw away such a profit, but when he will allow himself to become a party to fraud and deception and thereby endanger the prosperity of his neighbor, it is adding insult to injury, and if there is a man present in this audience who is selling his skim milk for ten or fifteen cents a hundred, to go into filled cheese, I ask him in all fairness, and in behalf of the dairy interests and prosperity of our state, to stand up and defend his position.

Something must be done, and in that something is involved the third question. What can we do to influence the market end of our business? There is a bill before the legislature to prohibit the manufacture of filled cheese, and also to prohibit oleomargarine from entering the market in the color of butter. This bill was drafted after much careful thought, and resembles closely the laws now in force in New York and Massachusetts. Such a law in Wisconsin would work harm to no one,

but would bring back to us the confidence and respect we once enjoyed, and would be of great benefit to the state at large.

It has no semblance of class legislation, as it would benefit an industry that adds prosperity to the whole state. It is perhaps true that it would be of some benefit to the dairyman, not in the advanced price he might receive for his product, for I do not believe it would materially affect the price of butter and cheese, but it would enlarge the market to some extent, make room for more honest goods, and thereby allow the producers to increase their output, and also give others encouragement to engage in the business, who are now held back by the fear and uncertainty that always go hand in hand with fraud.

There are a few men in Wisconsin who ask the legislature to give them the right to manufacture filled cheese, and they are the only ones who have ever made a dollar in the business. If the legislature should grant their request, it would be class legislation pure and simple, because it would only benefit two or three hundred men, and would ruin the cheese industry of the whole state.

Again let us look at the oleomargarine question. According to Mr. Armour's sworn statement it cost him less than five cents a pound to manufacture oleomargarine. There are several millions of men in the United States engaged in the manufacture of butter, and there are invested in this business hundreds of millions of dollars. It costs our dairymen something like thirteen cents a pound to manufacture butter, and this product which has cost him thirteen cents a pound to produce, and that he has worked hard for, paying taxes on his investment to help support the government, has to come in competition with a counterfeit that was produced for five cents a pound, and a few millionaires in Chicago could easily duplicate the output of butter in pounds if they could induce the people to eat it.

But you say this is not class legislation, because the manufacturer of oleomargarine has to pay a revenue on his product, and that there is a large class of poor people that prefer to buy this packing house butter.

Oleomargarine costs to manufacture, revenue and all, less than seven cents per pound. What does it sell for? Seven-

teen to eighteen cents a pound. Then the poor people of the world are paying the few millionaires one hundred and fifty per cent profit for their goods, and the millions of hard-working, sturdy farmers of our country are striving to make their ends meet.

Is this class legislation? Certainly not for the poor man or farmer. We ask that oleomargarine be prohibited from entering the market in the color of butter, because it is not butter. It is churned in milk that imparts to it a butter flavor, and is colored in the natural color of butter to deceive the consumer. If the man that makes oleomargarine is not ashamed of his business and his product and believes it is good for the poor people and that they want it, why does he not let it stand on its own bottom, and sell on its own merits? Why does he deceive the people in the belief that it is butter, by coloring it in imitation?

Should our bill become a law, and we pray God that it will, the poor people will still have the same chance to purchase bogus butter that they now have, with the further assurance that they are getting just what they pay for. It may not please the eye quite as well, but it will be just as good, just as palatable, and just as indigestible as when it paraded in the color of butter.

The law in Massachusetts contained this same prohibitory clause, and has been declared constitutional by the United States supreme court. The court said, "We are of the opinion that it is within the power of a state to exclude from its markets any compound manufactured in another state, which has been artificially colored or adulterated so as to cause it to look like an article of food in general use, and the sale of which may, by reason of such coloration or adulteration, cheat the general public into purchasing that which they may not intend to buy.

"The constitution of the United States does not secure to any one the privilege of defrauding the public. The deception against which the statute of Massachusetts is aimed, is an offense against society, and the states are as competent to protect their people against such offenses, or wrongs, as they are to protect them against crimes or wrongs of more serious char-

acter, and this protection may be given without violating any right secured by the national constitution and without infringing the authority of the general government. It is legislation that can be most advantageously exercised by the states themselves."

Filled cheese is made by injecting two and one-half pounds of neutral oil into every one hundred pounds of skim milk. This kind of cheese has no flavor, it is hard to digest and no person would knowingly eat it. It is sold by Chicago jobbers, and by them to the retail trade. The consumer calls for some good cheese and pays accordingly, but is just as liable to carry home filled cheese as otherwise. Every pound of this fraud stands in the way of so much good cheese, and more than that, I believe that every pound of such cheese drives from the market two pounds of good, honest goods. The consumer has been so many times fooled, that he has become disgusted with the whole thing, and discouraged in his effort to get good cheese, and refuses to buy.

New York cheese is being retailed from many a grocery in Wisconsin. The New York brand carries with it a guaranty of honest goods, because that state has a prohibitory law against the manufacture of filled cheese.

Just stop and think of this state of affairs for a moment! We refuse to eat our own cheese, and the money that should go into the pockets of our own dairymen, is being sent to New York, and we can make just as good cheese as they can. In fact the two great cheese states of the union are New York and Wisconsin. There is displayed for sale in the grocery where I do my trading in the city of Beloit, New York and Wisconsin cheese; the proprietor tells me that he buys his cheese from a Chicago house, and he told me recently that he would buy no more Wisconsin cheese, as it dried up and cracked open and he could not sell it.

Canadian cheese is found in our hotels and dining cars. Canada is in possession of that splendid reputation that was once ours, and she is going to take very good care of her advantage.

If some of our filled cheese men could spend a day or two at one of their great dairy conventions and watch those broad-minded, intelligent men labor for a still higher standard of

excellence, they would come to feel ashamed of the caliber of their own intellects.

Time forbids my saying more on this subject at this time, but I want you to take action in this matter. Let us have some strong resolutions. I trust, gentlemen, that your work in this convention will be characterized by thoroughness and harmony, and that we may go forth from this meeting with the knowledge that we have done all that was possible to do towards the advancement of the great industry we represent. In the future, as in the past, let our motto be forward.

The Chairman—We are very fortunate in having present with us a gentleman who is highly qualified to discuss the next subject on our program, How to Breed a Herd of Dairy Cows. He is one of our most successful breeders of dairy cows, the gentleman who owned and bred Brown Bessie, that wonderful dairy cow that took the first prize at the world's fair.

HOW TO BREED A HERD OF DAIRY COWS.

H. C. Taylor, Orfordville, Wis.

Breeding a herd of dairy cows involves, first, a choice of breeds; second, a choice of families of that breed, and third, a choice of individuals of that family.

I will not at this point offer any argument in favor of any breed, but call your attention to a few principles of breeding.

First, the principle of heredity, which is the doctrine universally accepted that the offspring inherits the characteristics of the parent. In dairying we are endeavoring for an inheritance of dairy qualities, and these qualities are largely fixed by the nearest parents—sire and dam, and yet we occasionally find an animal possessing the characteristics and qualities of a remote ancestor, which are as liable to be undesirable as good qualities.

We may from this reasonably expect dairy breeds to transmit dairy qualities; and families of a dairy breed possessing family

traits of character will transmit those traits to their offspring in common; and individuals possessing these traits in a marked degree are the animals through which breeders work effectively in elevating the dairy standard of their herds. It is in this way and by these means that any desired or chosen qualities in any breed of domestic animals are maintained and perpetuated. Selection and mating animals possessing certain traits, and training and developing those traits, fixes a power of influence or prepotency in the offspring.

This leads me to speak of the second and more important principle of breeding, called prepotency. I mean by this, that peculiar power which is possessed in a very marked degree by a few animals of either sex, of transmitting to their progeny all the desired individual characteristics of the parent, so that the descendants have a uniform resemblance and quality. It implies a special accumulation of vital force or superior influence of the parent over the traits of the progeny. This element of prepotency may consist in the ability to transmit inferior qualities as well as those of superior excellence, and its index is not stamped on any external appearance. It is an unseen and inborn principle only to be known by the quality of the progeny.

But the question of how to breed a dairy herd still calls loudly for solution. Amateur breeders are many that will give prompt answer and prescribe rules. But the experienced and successful breeder is cautious about giving advice, remembering full well his own losses, disappointments and failures. No prescribed rule can be laid down nor followed at all times.

So various are the conditions, I would advise you to set the standard high. Your ideal or model cow should be an excellent one, and when you possess her, the great problem then that confronts you, as it does every breeder, is that of duplicating her, or breeding so that each succeeding generation shall be an improvement on the present.

I would eliminate every cow of whatever breed, age or color, from my herd, that did not come up to the required standard, be that number few or many. No cow should have a place in my breeding herd that could not prove herself a profitable cow for the whole year. This individual quality should be the test

and of prime importance. I would like to have her possessed of many other desirable features, such as a fine head and horn, long, slim tail, carrying a heavy bush, a wedge shape body, deep flank and broad loin. Then I would be pleased if her color suited me, and I would not object to her having a pedigree, and that pedigree tracing to a long line of butter producers. Would you? Especially if her breeding showed her to be a near relative to Brown Bessie, Merry Maiden, Ida Marigold, or Hugo Countess, or to the Guernsey, Sweet Ada, or Materna, or the Shorthorns Nora or Genevieve, or to some of our noted Holsteins—Johanna 5th, for instance.

Then comes the question of a suitable sire to place at the head of this herd. This is a matter that every dairyman has to pass his judgment upon. It is a threadbare subject. Much has been written about it, and yet we, as dairymen, do not attach importance enough to this feature of our dairy breeding. This desired prepotency comes to an animal after many repetitions in breeding for the same purpose, and fully developing this especial feature and breeding again. I believe in using a sire that is inbred, or I would say a line-bred animal, one in which his dam is his grand dam and great grand dam also. I would use no sire that was unable to claim an unbroken line of dairy ancestors, and ask him to prove his claim. I would like him to have as many other desirable features as possible, the more the better, but these should be of secondary importance. The history of his race, the history of his family, the history of his claim upon our attention, are revealed to us by his pedigree.

The cows I have called your attention to can be gathered together on any dairy farm in Wisconsin, and by careful investigation and study of dairy breeds, we may make a proper selection of a sire to place at the head of this herd.

These profitable cows and prepotent sires are the essential means of successful breeding, and apply to the average dairyman as well as to the breeder. The time has come in Wisconsin when every dairyman should be a breeder, to a certain extent, of dairy cattle. My urgent advice to you as dairymen is to acquaint yourselves with the history of dairy races, and study the special methods of successful breeders, and if you

can couple this with a taste for the art, a love for the animal, and a genius for the work, you possess the essential means of success.

DISCUSSION.

Mr. Culbertson—In your careful ways of breeding stock, what percentage of heifers do you generally find worth keeping?

Mr. Taylor—We have got to that point in breeding now in our herd where about 100 per cent. of them are worthy of a place in a dairy herd. There are a few exceptions to this rule. We find by line breeding that once in awhile, when we carry it too far, and our premises have not been well taken, or for some reason we get pretty near a blank, we have an animal that does not do so well, but I have had very few, I don't know as I ever had but one. I believe in the course of a few years we can follow a line of breeding where we can reasonably give a guaranty that that animal may be a profitable cow. We find that in the female these qualities crop out more largely than in the male. I am speaking from a breeder's standpoint, and not from a dairyman's standpoint altogether. We want prepotency, and we can overcome any lack of prepotency in the female better than we can in the male, and we want to get that cumulative force into the sire and then we may be certain that it will overcome any counter blood that may be in the female. It is more difficult to find a proper sire than a cow.

Chairman—It seems to me that you put it rather strong, and that your answer to this question might be somewhat misleading. For instance, if I am breeding up a herd of grade cows using a pure bred sire, then what per cent. could I find worthy of a place in my herd?

Mr. Taylor—There would be very many of those animals that were not worthy a place in your herd. The persistency even in the sire may be entirely overcome by the other kind of prepotency, the undesirable kind; you will find that the persistence in the female of the mixed breeds will be overcome. I do not want to go on record as saying just how large a per

cent., but there will be a large number of those animals not worthy a place in your herd. It depends a good deal on the power of the blood in the cow that you use. You know that similars will give the best results and should be united. One animal bred to another one of a different potency altogether, which is going to predominate, do you suppose? It is a hard thing for you to tell. Similars to similars is a safe rule, like to like produces like.

Mr. Goodrich—I don't like to take issue with my friend Taylor, on anything, but when I have a fear that somebody may be mislead about what he says, I am going to question it. I will endorse his paper wholly, but when he says that there are none to be rejected, that a hundred per cent. we ought to save, I think that is a little too strong.

Mr. Taylor—You must remember he asked me directly with reference to my herd.

Mr. Goodrich—That is what I am after, your herd. Now, Mr. Taylor has got, we will say, the best herd of dairy cows in the state. He had one cow that is better than anything else in the state, and he has got some more that are almost up to her. Some are a little lower, they are not all the best. Now, should not he reject some every year at the tail end of it so as to go on and improve faster? I ask you old breeders if that isn't the right way, to improve just as fast as he can. Set your standard higher. Mr. Taylor, if you got four hundred pounds of butter a year that doesn't cost but eight cents a pound, set it higher, set it higher, go up faster. You know I am really saying this for the benefit of the rest of us who haven't got such herds as he has. Don't try and keep all your cows, there has none of you got so good a herd but what you want to make it still better and drop off some at the tail end of the procession, and build on at the head and keep on.

Chairman—We know that you have been very successful as a dairyman. I want to ask you about what per cent. you have to discard from those heifers that you raise yourself?

Mr. Goodrich—They are growing less and less every year, and that is where Mr. Taylor's herd is. His is a herd that has been bred for this purpose for many years. Years ago I used to reject about fifty per cent. out of mine. It isn't so much

now, but it is some, and it always will be some. If I get a herd that can produce twice as much as my herd does now, I shall keep on discarding and building up. I am going to have the best.

Mr. Taylor—There is a good deal of dairy theology in that little talk and I hope you will remember it. That is good gospel, but we can't set the standard by our best cow. If we did, we couldn't keep but one. The standard for the Wisconsin Dairyman first is along the line of profitableness. I tell you we would send many and many cows into the shambles in Wisconsin if that was the standard. The first point for us to decide is whether our cows are making us any money or not. If we have thirty cows and five of them are unprofitable, discard them, discard the least profitable so that the balance may have a chance. That is the first time I have had Mr. Goodrich ask me to put the standard high, for I always have had it almost too high. You see Brother Goodrich never started right, because he calculated to mix up hashed breeding and he had to overcome that difficulty all the time, and that is why he found a larger per cent. of unprofitable cows than I did. For fifteen years I have followed the same line of breeding and have the same similar characteristics, uniformity of color, size and quality. I have not gone out and got a mixed bred animal and used him in my herd at all. I have been very fortunate in getting some good crosses, but I had nothing but pure blood to start with. Now, I am talking to you dairymen with mixed breeds, and, of course, it is not quite the same thing. You must select every cow by the Babcock test and see that she is a profitable cow. Then put a fine sire at the head and you will have a fine herd of dairy cows.

Mr. Harrington—What is the average difference of fat between the dam and the offspring? For instance, the dam's milk we will say will test four per cent. Now, what should you expect from the offspring of that dam, and will the variation be any more on the dam's side than on the sire's side? What I want to get at is, can you take a four per cent. cow and expect her offspring to be a four per cent. cow or a five per cent. cow? How should we choose between the dam and the sire?

Mr. Taylor—I should study my plans very carefully. In breeding from a four per cent. cow, if the milk of her daughter was not as rich as hers I should question the propriety of continuing that breed. We must seek to keep up richness in milk. The prepotency in the sire, in my opinion, has as much influence over the richness of the milk of the progeny as the dam. I wouldn't want to go on record as stating which has the more influence, but I expect my cows will give as rich milk as the preceding generations give.

Mr. Harrington—We will say my sire's dam gave five per cent. He is bred on the cow that tested four per cent. fat, the offspring, we will say, is a four per cent. cow. On the other hand we will take a dam that is testing five per cent. and she is bred to the sire whose dam was a four per cent. cow. Now, will you tell us what the variation of the offspring usually is? It is true that on general principles, like begets like, but here is a three per cent. cow in my herd that has never tested better than four per cent., and her offspring tested four and three-eighths on the composite test. At the Vermont experiment station they claim that the variation between the dam and the offspring is not over one-third of one per cent. In my cows I find it nearly one per cent.

Mr. Taylor—I don't know that I can answer the question intelligently, and I don't think it is a question that can be answered intelligently before you test the quality of the offspring. I have never made experiments along that line. It is one of the results of breeding that is the result of proper nicking, proper mating; the law of heredity influences those things, and it is a very uncertain thing to speculate upon. Of course, I believe that animals of the same quality produce the desired qualities that we are after, the dairy quality. All things else should sink into secondary consideration.

Mr. Aderhold—Mr. Goodrich, how many years do you think a cow ought to be milked before you can tell how good a cow she is, or is going to be, or whether she is a profitable cow or not?

Mr. Goodrich—I think I would find out the first year whether she gave me any profit that year or not. She would have to give some indications of being profitable even the first year.

Still I have known of those that were,—say, medium, the first year, that turned out to be excellent cows, but I reject a good many the first year. This idea of determining about just what per cent. of butter fat you can expect by combining certain animals, you can't figure that out to a mathematical certainty, or nothing like it. You have got a cow that you tested last year all through the season and she averaged a certain per cent., but you can't be sure of what her offspring will do. Right in here comes a little experience of mine. I had a heifer from a cow that was the best producer I have ever owned, would give a good big quantity of rich milk, testing from six to seven per cent. I expected good things of that heifer, but I was disappointed in the small quantity of milk; the first year when she was two years old, she only gave twelve pounds of milk a day. I expected in two or three weeks, of course, she would give more, but she didn't, and after two or three weeks I commenced to test her, and I found she tested seven per cent. right along. That wasn't so bad, a pound of butter a day for a two-year old heifer. The next year she came in and gave twenty-five pounds a day; I said I have got a boomer, twenty-five pounds of seven per cent. milk, but when I tested it, I found it wasn't over five per cent. What you are after is the amount of butter fat you can get out of a cow, and it isn't so important that you get it in a good deal of water. I don't care to handle a lot of water.

Mr. Aderhold—Is it safe to rely on the Babcock test the first year that you milk a cow, in determining the future value of the cow?

Mr. Goodrich—I think— I want the Babcock test, yes; the scales and the Babcock test.

Mr. Church—Is not an inbred animal liable to be weakly constituted?

Mr. Taylor—I have not found it so.

Mr. Noyes—If a man is going to invest several hundred dollars, will it pay him to buy four cows at a hundred dollars apiece, or to buy twelve common cows?

Mr. Taylor—That is according to whether you look to the breeding end for profit entirely, or from the dairy standpoint. From the dairy standpoint a man might make more profit in a

few years by buying twelve cows, but in a lifelong run in dairying it would be another question entirely.

Mr. Noyes—Isn't that a question the dairyman wants to look to?

Mr. Taylor—It is a question I have had in view for many years. Many average dairymen only work for the profits they get from the butter and cheese. If a dairyman has a liking for the business and intends to stay in it, I would advise him to get registered cattle and follow it up.

A Lady—Will the gentleman tell me the name of the best dairy stock, the most profitable dairy milker? I hear a great deal about it, but I would like to have his opinion.

Mr. Taylor—I am of the opinion that there are a good many good breeds of dairy cattle that have been specifically bred and handled and thrown around them those environments that are conducive to the full development of the dairy qualities, and that the person succeeds best with that breed of dairy cattle that he likes best, that is best suited to his conditions and surroundings, and which has his approval and his sympathy, and I will say, his prejudice. If the lady will ask me tomorrow, I will bring her a report of one of the greatest tests that was ever conducted in this or any other country, which bears upon this question.

Mr. Aderhold—What breed of cows have you?

Mr. Taylor—Mine are Jersey cows.

Mr. Robertson—Would you recommend a beef grade for the purpose this lady asks about?

Mr. Taylor—I believe it would be unsafe to expect to make money from strictly beef grade, Shorthorns or others. I think she would do better with some breed that has been bred for this specific purpose.

Mr. Hill—If a dairyman has ten grade cows that will produce him three hundred pounds a year, how much can he afford to pay for a sire?

Mr. Taylor—That is a question of what he has in view, what he expects to run into. If he buys him a thoroughbred and desires those cows for one cross, he cannot afford to pay nearly so much as if he expects to develop into a line of breeding.

Mr. Hill—If he is going to do the latter, how much can he afford to pay?

Chairman—Wouldn't it be well to answer it this way, get the best sire you can and get him as cheap as you can?

Mr. Taylor—You must decide these questions for yourselves and just buy the very best sire that your judgment and your pocketbook dictates.

Mr. Cate—How much could you afford to pay with your herd for a good sire?

Mr. Taylor—Of course, we are following out a certain line of breeding down there, have for a good many years. Not very long ago I felt the need of deciding what the next cross would be upon my herd, and I paid $600 for a two-year old Jersey. I wanted him, I knew where he was, and if I did not buy him then I couldn't get him at all, and I paid that amount for him. Perhaps that doesn't answer you, I would have paid a good deal more for him if I couldn't have got him for $600, and I would have bought him for $150, if I could.

Mr. Crossfield—At what age do you consider that a sire will do his best in breeding up a herd?

Mr. Taylor—It depends upon the vitality of the sire; probably not under two years of age, from that on, according to the physical condition of the sire. He must keep up in physical condition and plenty of vital force; he must not be a very fat animal, but we must look specially for the vitality of the animal and his genral health. Keep him vigorous.

HOW SHALL WE GROW THE BEST AND MOST SUCCULENT COW FEED?

C. P. Goodrich, Ft. Atkinson.

Grow corn, preserve it in its succulent form in the silo, and we can have succulent cow food during the long winter and through the drouth of summer. Corn will produce more cow food per acre than any other plant in Wisconsin. It is easier

preserved in the silo. Plant as large a variety as will be reasonably sure of sufficiently maturing to contain the maximum amount of nutriment. Plant either in hills or drills about twice as much seed per acre as is usually planted when we care mainly for the grain. Cultivate well and thoroughly.

Now, Mr. President, I believe I have answered the question.

It is true that some prefer to raise roots for succulent winter food, but I believe, from my own observation and experience, that although they are good, they are more expensive to raise and have less nutritive value.

Grass, clover and other forage plants are the succulent foods usually provided for summer feed, but as this belongs to Mr. Crossfield's subject I will not invade his territory.

It may not be amiss if I indulge in a bit of history. In 1874 when many of us were anxiously inquiring: What shall we do to be saved from the ruin that constant grain raising is sure to bring? that a two-days' meeting of dairymen was held in the city of Fort Atkinson. Among the valuable papers read there was one by Mr. King, father of our Prof. F. H. King. Mr. King was one of the pioneer dairymen of Jefferson county, Wisconsin, and his paper made such an impression on my mind that more than twenty years have not sufficed to efface it. He said in substance: "Grass, succulent, juicy grass, is the most perfect food for producing milk. If we could have it the year round our cows would produce much better. But we cannot have grass in the winter time. But," said Mr. King, "we will come as near to it as we can. We will cut our grass when it is at its best, carefully cure it into hay and we have done the best we can."

Now, it might be supposed that in drying succulent food nothing but the water need be taken out. But this is not the case. Something beside the water is taken out that can never be restored. Its succulence can never be restored, add all the water we may. A succulent, juicy peach, after being dried can never be made a succulent peach again, do what we may.

Now, this was the situation in 1874, when those words of Mr. King kept ringing through my brain for days and days. "Grass in the winter time. Succulent food in the winter time!" Can we ever have it? A peach could be canned and its

succulence preserved for any length of time, but no one in America, at that time, knew that the same thing could be done with succulent forage plants.

Yet, at this same time, in 1874, this very thing of preserving forage plants with their succulence retained for winter use, was being practiced to a small extent in France, and an agent of the United States was there studying the business and writing up a report of the same. This report was made in 1875, and in the winter of '76 and '77 the Department of Agriculture of the United States sent these reports out through the country. Soon after I received one of these reports I met Levi P. Gilbert, an acquaintance and farmer living near Fort Atkinson. He said to me, "Have you received one of the agricultural reports?" I replied that I had.

"Have you read the report about preserving green fodder?"

"Yes."

"What do you think of it?"

I replied: "It is astonishing. It seems almost incredible, but coming from the source it does, I believe it is worth trying."

He said: "I think so, and I am surely going to try it."

My reply was: "All right, that's good. It will save me the trouble of making the experiment. You be to the expense of making the trial and I will be on hand to profit by your experience."

The French way of making silos at that time was to dig a pit in the ground. Mr. Gilbert followed the same plan and dug a pit twelve feet wide, six feet deep, and thirty-two feet long, and filled it with green, succulent fodder corn put in whole. He piled it up nearly as high above the surface of the ground as it went below, and then covered with earth. It soon settled down to the level of the ground around, and he awaited developments. When winter came Mr. Gilbert opened his pit and found what would, even now, be called a pretty fair article of ensilage.

It was not perfect. It was slightly acid and had a little smell of alcohol. But it was succulent cow food, and Mr. Gilbert said his cows ate it greedily and gave more milk than ever before in winter, and the flavor of the butter was good. Mr.

King's words again went ringing through my mind: "Grass in the winter time; succulent food in the winter time!" And I said: "Eureka, we have found it!" This was in 1877, and this was the first silo made in Wisconsin or anywhere west of the Alleghany mountains, and, according to the best information I can get, the second one made in the United States. From this beginning the use of the silo as a means of preserving food in its succulent form for winter use has extended all over the country, till now, I think, at least a majority of the best and most successful dairymen in the country believe in, and use the silo and think they could hardly afford to follow dairying without it. It is true that there are many who have a strong prejudice against it, but it is a noticeable fact that such persons have never had silos, at least not good ones. I have yet to see the man who has had a good, well-constructed silo, properly filled with corn at the right stage of ripeness, but who believes that by the use of corn and the silo we can grow and preserve the best and most succulent cow feed for winter use.

I believe also that there is no better way to provide summer feed as part of a ration, at least during the time of drouth, which we are sure to have each summer when the pastures are parched up by the fierce rays of the sun. I know of some dairymen who feed their cows corn ensilage every day in the year, even when they are in good pastures, and report that they do much better than without the silo. It affords a variety, and they will leave the best of pasture by 4 o'clock in the afternoon and come up to the barn and ask to be let in and fed ensilage, which they eat with great relish.

But I must keep clear of this subject of summer feed, as that is assigned to another.

I want to say a few words to those dairymen who denounce the silo and say the man is foolish who builds one. If I wished to learn and practice the best methods in any business I should ask advice, and practice the methods of those who, under the same circumstances, were successful. Prof. Woll, of our agricultural college, sent out circulars to a great number of representative and successful dairymen in all parts of the United States and Canada, asking a series of questions.

Among the questions was one as to what they fed. He received replies from one hundred of these successful men, representing nearly 2,000 cows producing an average of over 300 pounds of butter per year per cow. Of these one hundred dairymen, sixty-four fed corn ensilage.

In the south but few fed it, presumably on account of the shorter winters, and therefore less need of providing succulent food for winters. As we come north we find more silos. When we get to Wisconsin we find reports from fifteen dairymen, and twelve out of that number fed corn ensilage. Is it possible that twelve-fifteenths of the best dairymen in our state are of the foolish class? When we get to Canada we find nine reported, and every one of them fed corn ensilage. Is it possible that they are all fools in Canada?

If these objectors to the silo are right it would really seem that the less a man knows the more successful he will be in feeding cows. Be that as it may, I shall follow the practices of the most successful men in whatever business I engage in, and am still compelled to believe that the "best and most succulent cow food" per acre can be provided by growing corn and preserving it in the silo, except what can be fed out in the fall while it is yet in its succulent state.

DISCUSSION.

Mr. Curtis—What kind of corn would you use?

Mr. Goodrich—I would raise the largest variety of corn that will be sure to sufficiently mature in your latitude.

Mr. Curtis—And it should be cut at about the roasting stage?

Mr. Goodrich—A little more than the roasting stage. If it is Dent corn, make it about the time it begins to dent, about the time that a good farmer would say, "It is about time to cut up and shock my corn." I would commence a day or two beforehand for fear some of it would be a little over-ripe. I believe that is the time to get the most nutriment out of it.

Mr. Curtis—You spoke of Mr. Gilbert digging a pit or silo

as a sort of temporary silo. What was the character of the soil there?

Mr. Goodrich—It was sandy, smooth land, but sandy enough so that if there was any water got in, it would run out, it wouldn't hold water.

Mr. Taylor—Does Mr. Gilbert recommend that kind of a silo now?

Mr. Goodrich—No, nor I don't recommend the kind of silo that I built first.

Mr. Curtis—What kind do you recommend?

Mr. Goodrich—I recommend a round silo above ground. If I was where I could get stone handy and it didn't cost too much I would build it of stone, I would cement it up and would make it round, or have the corners rounded.

Mr. Loomis—Don't you think you would find trouble with the frost going through, if it was stone?

Mr. Goodrich—I would have it part stone and part wood, I would have a stone silo, then I would have some studdings—two by four's,—and some wooden sheeting outside of that, so as to have a dead air space.

Mr. Loomis—There are several silos in our county, extending up perhaps eight or ten feet, and they are stoned up on the inside and lathed and plastered, but I noticed last winter that the frost showed as high up as the stone went.

Mr. Goodrich—Is there an air space?

Mr. Loomis—Yes, sir.

Mr. Goodrich—May be I ought to take back what I have said. I haven't had a stone silo and all I know about it had been report. I do know a good deal about wooden silos. I know a good deal about round wooden silos, and I know that the round silo is the way to build. Of course, the object of building with stone or brick or any such material is that the wooden silo will rot out sometime or other. You know what Prof. King reported. He traveled all over and found that most all the wooden silos were beginning to decay. I have seen a silo badly rotted after being filled twice.

Mr. Brigham—Do you mean to say that you prefer a silo above ground, or is it simply because it is cheaper?

Mr. Goodrich—It would depend on the location altogether.

Of course I was thinking of the level ground where my silo sat. I was thinking that if it went down in the ground I would have to lift the ensilage, and I would rather do all the elevating before it goes in. If you can build it in a side hill, if the water don't run in, I have no objection to that.

Mr. Brigham—I have one partly underground and partly above, and we like it and there is no frost.

Mr. Cate—In filling the silo, do you fill it as quickly as possible, or take time to do it?

Mr. Goodrich—I will give you my rule: Fill as quickly as you can and as slowly as you have to. You can fill it as quickly as you are a mind to, or you can be two weeks about it, if you have to and not do any hurt. Down in our country, it comes right in the tobacco harvest and we have to do the work generally with our own help on the farm, so we are from eight to twelve days or two weeks doing it, and we plant different varieties of corn so as to have it ripen at different stages, so it will be sure to be just in the right stage all the way through.

Mr. Curtis—I have had some ten years' experience with the silo. My reason for asking the question about the character of the ground here, as to whether it is smooth or rough, was this: When I commenced with the silo, I commenced in a stone building. I had a large stone barn, about one-sixth of it—in one corner—extended one story below the general stable. That one-sixth was designed for roots. I took out these two floors and had a space there for a silo of solid stone masonry, twelve feet by twenty-four, and that was filled with cut corn ensilage. It kept very well, except about six inches next to the stone walls. I was told that I should have had a wood lining. Subsequently I went to great expense to line it with wood, so as to cut off the conducting character of the stone in taking the heat from the silage, but whether I didn't do it as perfectly as I should have done, or what was the matter, it still continued to spoil just about the same. Then I took off the wood, took it all out and plastered the walls, made it perfectly smooth, and the ensilage has kept perfectly ever since. Your wall must be smooth, and air-tight. Well, in the course of time, I began to want more ensilage and the stone work extended up the whole thirty feet on the two outside walls, but

the inside walls extended up only two stories, so I continued that on up, and now my silo is thirty feet deep, and it keeps well all the way through. We must have an air-tight chamber, that I am sure of. Some people said I must weight it, but with a thirty-foot pit, you can't weight it, and it doesn't need ground. If you erect a building thirty-six feet wide, two rows of stalls, and a floor twelve feet wide, you can put your silo right in the ground the whole length of the barn, and you can fill it easier than you can if it is thirty feet high. It will be below frost, if your barn is as warm as it should be, and those walls will stand, I warrant you, and it will be handier to feed it I think. You put a man into the pit with two baskets, of a bushel and a half each, with a rope, and you can just pull it up and give it right to your cows as handy as can be, close by. I believe you will feed your cattle with less labor than you can from a thirty-foot building, which must be outside the barn.

Mr. Taylor—Mine is a square silo, built on the end of my barn. It was very convenient to two disconnected buildings, that is the reason I put it there, and it is opened to the row of cows, 112 feet long. As to putting it underground it depends altogether on the location of your barn, and the surrounding section. This gentleman talks about a building thirty feet high, perhaps it is the best for him under the circumstances, but our barns are mostly built on the level. If I were building again I would build a round silo and make it all of wood, and locate it near by where I could connect it with my barn so I could take the ensilage right out and into the feeding alley. If you will keep the wood dry, it will not rot, or if it keeps wet, it will not rot; it is the wetting and drying that rots it. For that reason I don't like painting the inside, the paint simply puts an impervious coat on it, the moisture gets between the joists and works in behind the paint, and when you take the silage out that moisture is still there; it stays behind the paint and rots. I am sure that silage is one of the best rations for the dairy cow. Corn silage and a warm barn well ventilated, with good, fresh cows, is the nearest approach to nature we can ever expect to reach. No one has yet spoken of the cost of putting up silage; mine cost me this year $1.09 a ton. The first year I had an immense big crop and it only cost me sev-

enty-four cents a ton in the silo. My silo is twenty-four feet high; we open it and pitch the silage into the alleyway in front of the cows. How much does your silage cost a ton, Mr. Goodrich?

Mr. Goodrich—Now, I tell you I figured close on this. The first year it cost me just as near a dollar a ton as you could get it. I have asked a great many people and they have put it all the way from sixty cents a ton, but I don't believe they figured in everything, or else they didn't work right. I figure the rent of the land and all the work and the men's board.

SOILING DAIRY CATTLE.

By W. A. Henry, Director Wisconsin Experiment Station.

The first American writer to bring this subject prominently before our people was the statesman, Joshua Quincy, whose admirable essays on this subject were first printed in the Massachusetts Agricultural Journal in 1820. These essays were later gathered into a little book by the author, which is now out of print. By soiling is meant the cutting and carrying of the green forage of the fields to cattle or other stock kept more or less confined.

Quincy points out six distinct advantages from soiling:

First—The saving of land.

Second—The saving of fencing.

Third—The economizing of food.

Fourth—The better condition and greater comfort of the cattle.

Fifth—The greater product of milk.

Sixth—The attainment of manure.

In the economy of food, according to our author: There are six ways in which beasts destroy the articles destined for their food,—first, by eating; second, by walking; third, by dunging; fourth, by staling; fifth, by lying down; sixth, by breathing on it. Of these six, the first one only is useful. All the others are wasteful.

Our author's practice was as follows: Twenty cows were kept in stalls, being given forage six times a day. They were allowed two hours in the forenoon and two in the afternoon for exercise in the open yard. While out of the stable the stalls were cleaned and freshly littered. In his section cattle were turned to pasture June 1st.

"On the 30th of May," our author writes, "my farmer began to cut the sides of the road leading to my house from the highway and orchard," thus beginning the soiling.

The area in soiling was as follows: The twenty head consumed the product of

Two and one-half acres road sides and orchard.

Three acres mowing land.

Three and one-fourth acres Indian corn cut as fodder.

Two acres late and light barley.

Three acres oats.

Two acres late sown Indian corn after pea crop.

One-half acre buckwheat.

One acre millet, buckwheat and oats.

Total, seventeen and one-fourth acres.

This interesting paper may be summarized in the author's own words:

"After these allowances and offsets, which no man can doubt are sufficiently liberal, then I state that my experiment has resulted in relation to land, in this, that I have kept the same amount of stock, by soiling, on seventeen acres of land, which had always previously required fifty acres."

At the Wisconsin experiment station the writer kept three cows during the summer season on a dense blue grass pasture, while three other cows were kept in stable and yard, being maintained wholly by green crops cut and carried to them. The three cows on pasture required 3.7 acres; those soiled required 1.5 acres. The yield of soiling crops from the one and one-half acres was as follows:

Green clover, three cuttings	19,762 lbs.
Green fodder corn	23,658 lbs.
Green oats	23,085 lbs.
Waste from uhe above	1,655 lbs.
Total green material 1 1-2 acres	43,180 lbs.

The products obtained were as follows:

	From 3.7 acres pasture.	From 1 1-2 acres of soiling crops.
Milk	6,582.8 lbs.	7,173.1 lbs.
Butter	303.12 lbs.	294.75 lbs.

Thus an acre of soiling crops yielded nearly two and one-half times as much butter when fed to dairy cows as an equal area of good blue grass pasture.

Phelps, experimenting with soiling crops at the Storrs experiment station, recommends the following list, which will be very helpful to farmers looking for information in this direction.

Table showing soiling crops to be used, dates for seeding, and times for cutting of various soiling crops.

Kind of fodder.	Amount of seed per acre.	Approximate time of seeding.	Approximate time of feeding.
1. Rye fodder, bushels	2 1-2 to 3	Sept. 1	May 10-20
2. Wheat fodder, bushels	2 1-2 to 3	Sept. 5-10	May 20—June 5
3. Clover, pounds	20	July 20-30	June 5-15
4. Grass (from grass lands)			June 15-25
5. Oats and peas (each), bushels	2	Apr. 10	June 25—July 10
6. Oats and peas (each), bushels	2	Apr. 20	July 10-20
7. Oats and peas (each), bushels	2	Apr. 30	July 20—Aug. 1
8. Hungarian, bushels	1 1-2	June 1	Aug. 1-10
9. Clover rowen (from 3)			Aug. 10-20
10. Soja beans, bushels	1	May 25	Aug. 29—Sept. 5
11. Cowpeas, bushels	1	June 5-10	Sept. 5-20
12. Rowen grass (from grass lands)			Sept. 20-30
13. Barley and peas (each), bushels	2	Aug. 5-10	Oct. 1-30

Few Wisconsin dairymen, however, are ready at this time to confine their cattle to the barn yard in summer time with but a small range of grass land for exercise, while they cut and carry all of the green forage to them. This would be so revolutionary for a single step that none would think of doing it. I seriously commend to the consideration of our dairymen an intermediate step, or partial soiling, which will certainly be found profitable in many ways when rightly practiced.

Each spring we observe our June grass pastures affording a wealth of feed far beyond the ability of the cattle to consume. The short-sighted dairyman then often wishes that he had

more cattle, for the feed seems going to waste. By dog-days the situation is usually changed, and the pastures that were so luxuriant in June are often bare and brown, and the cattle worn with fighting flies and the sweltering heat nervously crop the scant bite left them. The lessened milk flow shows that the profits in dairying have gone with the hot days and the withered grass. Then is the time that the prudent farmer avoids this common occurrence, and keeps his cows in plenty and comfort. The first crop to be used in such cases is rye, which can be cut after the middle of May; often this may not be needed. for the pastures are then abundant. Later comes oats, which may be cut as soon as the heads appear. When the oats have been fed, the red clover begins to show its blossomed heads and may be cut with great advantage. By cutting very early, the second crop of clover springs up rapidly and gives a large yield. By the time the second crop of clover is partly used, early planted corn is ready for use, and from this time on there is no lack of provender for the herd.

By the last of September, or a little later, the pastures are often excellent again, and from that on supplemental feed need not be supplied. If there is the least lack, however, I urge the liberal use of Indian corn. Often our farmers will allow their cattle to suffer for food in the pasture, when just over the fence stands the Indian corn stalks, each carrying a magnificent ear, awaiting the time of harvesting. Why should the cattle starve in fall when there is feed close at hand, that in winter there may be an over supply On many a farm in Wisconsin the cows actually suffer more for food in summer or fall than in winter, and many a dairyman who feeds grain and forage liberally in winter will shrink from cutting a little of the corn crop to supplement the short pastures, carefully keeping it all for winter use.

There is scarcely a dairy farm in Wisconsin where partial soiling may not be practiced with great profit, and when once adopted it will never be neglected. Those who learn of the value of this system will gradually extend its use, and as the price of land increases and the price of labor comes to a lower level, we may expect on some farms to see full soiling established.

FEEDING THE DAIRY COW.

C. P. Goodrich.

We want to feed the dairy cow so as to make the most profit. That is right so far. Now, how shall we do it?

Shall we try and feed her just as little as we can squeeze her through with? No, I guess there won't anybody agree to that. We will feed her as to quantity, all that she can eat and properly digest, and manufacture into the product that we want, which is milk. When you go to crowding her beyond that, and feeding her so that she has to put some of it on her ribs, hold on.

The next point is, you want to feed as great a variety of foods as you can; you want to feed a good proportion of protein food so that the ration will balance about one to six. There is a wonderful similarity of rations found among these one hundred successful men that we have heard about, that is, when it comes to be analyzed, the proportion between the protein and carbo-hydrates. The first one here says, thirty pounds of corn ensilage, eight pounds of hay, five pounds of corn fodder, four pounds of oats and two pounds of pea meal. The pea meal is for the protein. Another, forty pounds of ensilage, eight pounds of clover hay, six pounds of bran, two pounds of pea meal. Here is another one, and I know it is right, because it is mine: Thirty-two pounds of corn ensilage, five pounds of clover hay, five pounds of corn stalks, eight pounds of bran, two pounds of cottonseed meal. Now, I can tell you a little about that ration. We had been feeding eight pounds of bran and two pounds of corn meal, but when we came to figure on that ration, I said, "That isn't balanced exactly right; there is some corn in the ensilage, and there is a little too much carbo-hydrates." I said the cows are doing pretty well, but we will try some cottonseed meal, and so we swapped for two pounds of cottonseed meal. The cows went right up in the amount of milk. That showed we had a better balanced ration than before. I submitted that ration to Prof. Woll, and he said it was just right, the cow said it was just right, and I said

it was just right, and when the butter rose up, I made two pounds of butter more a day from twenty-five cows. I figured out that in changing two pounds of corn and oat meal for two pounds of cottonseed meal, the difference in the cost was fifteen cents. I sold the butter for thirty cents, so I swapped fifteen cents for thirty cents, and I would like to keep on doing that kind of business as long as I live. Now, that is the effect of feeding a balanced ration. Not that I think cottonseed meal has such wonderful virtue, but it has lots of protein in it to balance up. My son sent down to St. Louis and got a carload of cottonseed meal. Another man tried some of it, and had the same good effects; he thought that if he fed two pounds and got such excellent results, that if two pounds was a good thing, four pounds ought to be better. So he gave them six pounds, and he made his cows sick, and I guess some of them haven't got over it yet. You see you want to balance the ration; you want to feed according to the capacity of the cows. We don't feed all the cows alike by any means. Here is one cow that I will give oil meal, a little cottonseed meal and bran and clover hay and ensilage, and don't put in any corn meal, because I know that if she had it, she would put on fat. Here is another one I feed the same kind of a ration; it all seems to go into milk, and she runs down. I give her some fattening feed because there is no danger of her fattening up. There is another thing, a good many men ask, "You are putting your cows right through feeding them up so high, won't you wear them out?" Or, as they express it, "won't they burn out?" I tell you no. You feed a cow right, up to her full capacity, and she will last—well, longer than the cows that starve to death anyway.

Another point,—you want a proportion between the coarse food and the concentrated food. My rule is two pounds of hay fodder or ensilage to one of the grain feed. I say give her all she will eat, but when I say that I don't mean give her all the grain she will eat, because she might eat so much she wouldn't eat any hay at all, then you will not be feeding her an economical feed, and you may do her an injury. Drop off a little of the grain feed in that case and make her eat more of the coarse feed. You know Prof. Robertson figured out that they should

only have seven or eight pounds a day of concentrated feed. His was a very concentrated feed, a good deal of peas in it, but I found that the average cow wants about ten or twelve pounds to do her best; some can stand twenty, and others, it won't do to feed even ten.

DISCUSSION.

Mr. Siegel—Do you consider cottonseed meal better than oil meal?

Mr. Goodrich—It has a higher per cent. of protein in it and a less amount of it will balance up a carbonaceous ration, otherwise I don't know as I do consider it any better. We are feeding now bran and gluten meal, and the cows are doing well on that.

Mr. Siegel—How many pounds of oil meal would you recommend to feed to a cow?

Mr. Goodrich—I would not recommend over two pounds, feeding one pound at a feed twice a day.

Mr. Curtis—Does the cottonseed meal affect the butter?

Mr. Goodrich—It made the butter a little harder.

Mr. Curtis—Where the gentleman used six pounds how did that affect it?

Mr. Goodrich—I don't know, I didn't examine his butter. It did not increase the product any more than the two pounds did.

Mr. Curtis—In my early days I lived south where the cows were fed all the cottonseed they would eat, and it did affect the butter, made it a peculiar flavor, bad butter.

Mr. Meyers—How much of this gluten feed do you feed, and how much does it cost?

Mr. Goodrich—It costs $17 a ton, and we are feeding on an average five pounds a day. We get it at Ft. Atkinson, where I live; it is what they call Buffalo gluten feed.

Mr. Meyers—Can you feed butter fat into milk?

Mr. Goodrich—Oh, that is an old question over and over again. I have not been able to, although I have tried hard. I have found by using the Babcock test, just the same as they found down at the World's Fair, that cows will vary from day

to day in the richness of the milk, hardly ever running along two or three days in succession just alike. Now, these changes occur just as often when there are no changes in the feed as when there are changes.

Mr. Meyers—Hasn't it been admitted that in the spring and summer when the grass is coming along, and there is lots of slosh, that the milk is poor?

Mr. Goodrich—That is an effect you get by taking the cows off the grain feed and giving them lots of grass. You simply are watering the milk through the cow. If you can induce the cows to drink a large amount of water, you can induce them to give a large amount of milk, but not much butter,—the chances are that you won't make any more butter out of it. You can in that way make a little difference. Whatever you feed the cow and increase the quantity of milk, the chances are that the per cent. of fat will drop off.

Mr. Zar—I don't think it would pay me to buy oil meal at $26 a ton. I grind a bag of wheat and a bag of corn and two bags of oats, then I mix a bag of that ground feed with a bag of bran. My coarse fodder is cut cornstalks and oat straw.

Mr. Goodrich—I would give them a little oil meal, somewhere from one to two pounds.

Mr. Zar—I feed about ten pounds a day to an average cow. Now, would you recommend that I add two more pounds to that, two pounds of oil meal?

Mr. Goodrich—No, I would leave out some of the other combination. You see in my ration there is corn ensilage with considerable corn in it.

Mr. Meyers—Does the period of lactation affect the quality of the milk?

Mr. Goodrich—Oh yes; we know that any cow that has been in milk a good while will give richer milk as a rule.

Mr. Meyer—I have found very little variation where the cow was not bred again. I always heard it said of a farrow cow, that her milk was richer in butter fat, but I did not find it so in my experience.

Mr. Brigham—In my experience, testing cows, grade Holsteins and grade Durhams together, I found that as they

went dry, as a general rule, the Durhams would increase the per cent. of butter fat more than the Holsteins.

Mr. Church—Is a high grade cow more liable to have gargety milk than one that is not so high grade?

Mr. Goodrich—That's something I don't know much about. I have very little to do with cows that are not well fed with grain.

Mr. Church—My cows have been fed grain for the last two or three years and this winter I have been graining them heavily, but they are commencing to get gargety milk.

Mr. Goodrich—The best I know what to do, is to take good care of the cow, not let her get chilled in her udder, lying down on the cold ground or platform, and not have her udder bruised. I have seen cows lying down in the snow with the udder right on the ground, and it seems to me that is a pretty good way to bring on garget.

Mr. West—What is the weight of your ensilage to the square foot?

Mr. Goodrich—It varies considerably, but it runs from thirty to fifty pounds.

Mr. Taylor—Prof. King gave it last week an average of thirty-nine.

A Member—Have you ever had any experience feeding middlings to milch cows?

Mr. Goodrich—Yes, but I prefer good bran to middlings; I mean bran, I don't mean ground up dirt and stuff.

Question—Would you prefer a pound of bran for a pound of wheat when we can get them for the same price?

Mr. Goodrich—It depends something upon what the other feed is. I have always been in the habit of calling corn the cheapest feed, and I would rather have corn and bran than wheat.

Mr. Carpenter—If you were feeding coarse food, cornstalks and oat straw, wouldn't you rather have middlings than bran?

Mr. Goodrich—No, sir. These you have mentioned are carbonaceous food, and there is more protein in bran and I want it balanced that way.

Mr. Ring—How often do you water, twice a day or once?

Mr. Goodrich—Twice.

Mr. Harrington—Our cows have water all the time, so they don't have to go out, it is right in the barn. We feed all our grain dry. We calculate it is about a balanced ration. I was reading lately of some men who claim that by making a slop of your food the cow will produce more milk. Have you had any experience?

Mr. Goodrich—Yes, I have. If the cow has all the water she wants at a temperature that suits her and has it before her, I wouldn't give one cent to have any mixing of the food. Of course, if the water that they have to drink is ice water, and only once a day, it makes a difference; they would do better to have the food mixed, because they would get more water. But still, about this idea of getting cows to drink more water, I know some men that work hard for that. I have heard intelligent men argue that they want to get all the water in them they could. A cow would be a fool to drink if she wasn't thirsty.

IMPORTANCE OF SUMMER SOILING OF COWS.

Rhodell Crossfield, Oakland, Wis.

In order to more fully comprehend the importance of summer soiling of dairy cows as it is carried on in this country today, let us first go back a few years and see the conditions that have surrounded the dairyman and caused him to look for some substitute for summer pasture.

In an early day when these western states were thinly settled the dairyman had little need to bother his brain over what his cows would find to eat. If his herd got too large for his present pastures all he had to do was to take another quarter-section of land and he was provided with plenty of fresh pasturage. But as the country became more densely settled, farms were divided up, prices of new land became higher, etc., the dairyman began to see the need of something to take the place of summer pastures. As he cast his eye around for this "something" and studied the needs of the cow, he saw he must get some feed that would fill all the requirements of a good pasture as near as possible. You all know there is no

feed we can make or mix that will equal a good blue grass pasture for a cow to do her level best in making milk and butter. There seems to be nothing lacking; in fact it is a balanced ration. So it should be our aim to provide a food that comes the nearest to this pasture.

Now, my topic here today is the importance of soiling, I suppose, over that of pasturing during the summer months. The greatest importance to be derived is in being able to keep more cows on less acres, also, the food supply can be better regulated, the animals do not waste their energy in roaming over dry pastures searching for food, and the manure can all be saved and applied to the land where it is most needed.

To the dairyman who has plenty of land that is not adapted to the growing of cultivated crops, but will grow an abundance of pasture, little need be said about soiling. But that man is not the one I am advising to follow soiling. It is the man who is practising intensive farming upon high priced land that I would say to, "try soiling"—at least partial soiling. That will bridge over that spell in summer when the pastures are hot and dry.

I will quote an experiment made by Prof. Henry and reported in the third annual report, that shows in a very good way the great advantage to be gained by summer soiling over pastures. This experiment commenced June 15th, and was continued until October 15th, 1885, 122 days in all. During this period the yield of three cows from one acre of pasture was 1,779 pounds of milk which made eighty-two pounds of butter, and the yield of three cows from one acre of soiling crops was 4,782 pounds of milk and 196 pounds of butter.

Similar comparisons were made at the Iowa, Pennsylvania, Massachusetts and Connecticut stations. At the Pennsylvania station it was found by experiments of two years that "in round numbers we can produce from three to five times as much digestible food per acre by means of the soiling crops as we can by the average pasture."

At the Connecticut (Storrs) station four cows were maintained from June 1st to November 1st on a little less than two and one-half acres of soiling crops with the addition of a very

light grain and straw feed. So we find this system has been tried by the experiment stations with very good results.

By a judicious selection of soiling crops not only a much larger number of cows can be kept on a given area of land, but the land also may be brought into a higher state of fertility. The leguminous crops, such as clover, cow-peas, vetch, alfalfa, etc., are especially valuable for soiling crops, owing to their habit of taking up nitrogen from the air and storing it in the soil. Rye is the first crop in the spring that we can commence on, but it is good for only a few days as it soon gets too woody and dry. Then comes winter wheat. This I consider a very good crop for soiling as it is relished by stock until it gets fully ripe; also it grows a heavy crop when sowed thick on rich ground and does not winter kill. Next after wheat comes oats, and these with green clover and perhaps some millet or Hungarian will feed along until the first planting of corn is large enough and matured enough to feed.

Now a word about the corn crop, as this is the principal crop for the dairyman of Wisconsin. Where we are practicing intensive farming, that is, keeping many cows on few acres, of course we must plant our corn so as to get the greatest yield of succulent food. To do this it must be planted thicker than when we wish to harvest a crop of grain. In my own practice, I would plant about one-half bushel of seed to the acre, with the rows three feet eight inches apart. This gives one kernel every three inches. That is rather thick, but some of the kernels will not get covered good, or for some other reason will not grow, and if it all does grow it can easily be thinned out a little. I prefer deep cultivating the first time through and run the cultivator teeth pretty close to the corn. This leaves the dirt loose and gives a fine chance for the young roots to spread out and grow. Then each cultivating after that run a little shallower and a little farther from the row. The last time though, should there be any weeds that have escaped the cultivator during the previous cultivation, the teeth may be turned so as to throw the dirt around the stalks of corn and thus cover up these weeds.

Many do not like the practice of rowing corn one way, they prefer to row it both ways; but I think if land is reasonably

clean to begin with and is well prepared before planting, and then be given a good thorough dragging just as the corn is coming up, and the cultivating attended to at the proper time, as it should be, there will be little trouble from weeds. Another thing; do not commence feeding green corn too soon if you can possibly get something else. Green corn at its best is most all water. If no other green feed is at hand corn should be fed sparingly in connection with some dry feed, such as hay or oats. Corn fed before the ears glaze, I think, is an expensive way of watering cows. For oats I prefer some variety that stands up well and also bears an abundance of leaves on the straw. This makes a fine crop for feeding green, and if cut before they get too ripe, say just about when the top kernels begin to look white, will make an excellent feed during winter without threshing.

When we first tried feeding sheaf oats we stored them in the barn, direct from the field as soon as they were dry; but there we made a mistake. It made just a fine place for mice in the barn and a good many of the bands were cut and many oats wasted. Since then we have practiced stacking in small stacks, about two loads, near the barn, and draw them in as wanted, stack at a time.

As I have said before, clover is one of our best crops for soiling. I prefer the common red variety although last year we had four acres of Alsike that made four tons of cured hay per acre, but I notice the cows don't seem to take very readily to the coarse stalks. They will leave more or less, unless fed very sparingly of it. I prefer to seed with some other crop, preferably a fall crop, sowing the seed on in the early spring, on the last snow if possible. Last spring we seeded twelve acres of rye to Alsike and red, mixed about one pound of Alsike to three pounds of red, and put on about twelve pounds per acre. This rye was pastured down pretty close in the spring and then allowed to grow. We cut three acres of the rye and made it into hay, after which the clover came on and made a fine growth, so we cut it again, getting quite a little clover and rye hay. We sow a large share of our oat stubble to rye as soon as possible after the oats are off. This furnishes an abundant pasture during the fall and spring. Then

we can plow and plant to corn what we do not want for soiling and to seed in.

Now a word as to the care of cows during summer. When being fed on this green feed they should have some dry hay to pick at as well as a fair supply of grain. During the heat of the day, in fly time especially, it is better for the cows if they can be kept in a darkened stable with good ventilation rather than be roaming around and fighting flies.

As long ago as I can remember anything about farming, my father and my brother had 180 acres of land and kept four or five cows, raised wheat and sold off the fertility of the farm. But as the dairy industry began to show a little better opening than that of grain raising, they began to keep more cows. Soon a cheese factory was started near and the herd was increased to twelve or fifteen cows. About twelve or fourteen years ago eighty acres of the farm was sold and they commenced to make their own butter. From that time on the herd has been increased until today we are keeping twenty-five 300-pounds-of-butter-cows, ten yearlings and calves, six horses and twenty hogs on sixty acres of improved land.

DISCUSSION.

Mr. Loomis—Have you had any experience with millet?

Mr. Crossfield—Yes, we have, and we found it very nice food, fed green.

Mr. Loomis—In Sheboygan county last year, the clover was entirely killed. Now, what are we going to do with that land? We haven't land enough on our farms to plow for all the crop we want to put in. Will it be a good plan to put in millet on that land to soil the cows?

Mr. Crossfield—Yes, and also for the hay, if you like the hay. I should say, use the Hungarian millet and German millet.

Mr. Loomis—At what stage would you cut for hay?

Mr. Crossfield—Before the seed forms. If the seed is allowed to form in the head, they claim that it is injurious to the stock.

Mr. Zar—Do you plow the ground for the rye?

Mr. Crossfield—I prefer to plow it.

Mr. Church—What stage is the rye when you cut it for hay?

Mr. Crossfield—It should be before it blossoms, almost as soon as it begins to head. There is more danger in its getting too ripe, than not getting ripe enough. We find that that is where the trouble comes in; we think that if we will let it grow a little longer we will get a little more of it, but I think we would have done better if we had gotten to work two weeks sooner.

Mr. Goodrich—Have you ever tried rye for ensilage?

Mr. Crossfield—Yes, one year we had a small silo built for a root cellar, and we filled that with rye and it was a failure. We put it in whole, and it was just in blossom. I think there was too much air in the stalks, you know they are hollow, and we couldn't get it close enough; possibly if we had cut it up it would have been better.

Mr. Church—Did you ever have a failure with corn ensilage?

Mr. Crossfield—No sir, never did.

Mr. Taylor—Can you tell me the relative value between rye hay and clover hay?

Mr. Crossfield—I could not tell you in figures, but I should prefer the clover hay.

Mr. Winslow—You spoke of cow peas. What do you know about them?

Mr. Crossfield—We never raised them.

Mr. Winslow—I fed eight weeks from two acres of peas, all my cows could eat twice a day, with oats, and they did splendidly. They were sowed about half and half.

The Chairman—I raise peas and oats; I do so every year, and if it stands up pretty well I thresh it and grind it, but if it doesn't stand up well I cut and cure it just as I do clover hay; that is, cut it down and let it stand in the cock and sweat, then open it out to the air and it will be bright and green and make splendid hay for all kinds of stock. It is nearly as easy to cure as clover hay. When we cut it for hay, we cut it before there is any grain forms. You mustn't wait for the grain, you can't get the grain and the hay both at the same time.

Mr. Goodrich—I understood Mr. Winslow that he had fed

a piece of oats green feed, for eight weeks. How long was it green, succulent feed?

Mr. Winslow—Four or five weeks anyway. I was cutting at it eight weeks, and I was feeding thirteen cows.

Mr. Ebler—Does Mr. Crossfield find that a profitable way to feed his cows?

Mr. Crossfield—Yes, if I did not find it profitable I would not try it.

Mr. Ebler—How many acres of land does it take to keep a cow?

Mr. Crossfield—We plow just about sixty acres. The rest of our farm is a wood lot, or rather poor marsh, and on that sixty acres we grow coarse feed enough to feed all of our stock. We keep about twenty-five cows, besides ten head of yearlings.

Mr. Frank—Did you get these peas covered so that they would all grow?

The Chairman—When we sow peas we sow them broadcast on the surface of the ground after first going over it with a disc harrow to make it rough. Then we go over the field and plow them under four or five inches. They are deep rooted and must be covered deep; you must plow them under. Then sow your oats on and harrow your oats in. Be sure you get your peas deep enough. I sow broadcast but I think it is not quite as good as a drill.

Mr. Robbins—How much peas do you sow to the acre if you want to sow for soiling?

The Chairman—I would say about a bushel of peas to two bushels of oats. I have sowed two bushels of peas and one of oats, but I intended to cut for the grain, but they were down very much worse than where you do not sow the peas so thickly. Try to get a variety of oats that will ripen as nearly as possible with your peas, where you intend to cut and thresh. Of course the better the oats stand up the better the peas stand up. We sow what is known as the Canadian field pea, a small, white pea. We have used several varieties of oats and the variety that we use now both for field oats and with peas is what is known as the White Norway.

Mr. Merrill—Will it do to plow the peas under four or five inches when you have a heavy, clay soil?

The Chairman—It will; I have done it several years. It is a good plan to go over the soil with a disc harrow and then with a harrow before you sow your peas, for then your peas will lie in a fine soil and will germinate readily and come up nicely; otherwise, if there are hard lumps some of the peas will be in air spaces and they will come up unevenly, so it is a good idea to fit the surface of your soil, and then plow them under.

Mr. Church—Will peas and oats make more hay than clover?

The Chairman—Just about the same. I have had easily three tons to the acre of both crops.

Mr. Church—Have you ever had any trouble with hay getting musty?

The Chairman—Never, where it is well cured. If it is put into the barn in bad shape, it will get mouldy like clover hay.

Mr. Church—Is your oat and pea hay anywhere near as good as clover?

The Chairman—Yes; oat and pea hay has more digestible nutrients, pound for pound, than clover. I do not say it is better hay for a dairy cow than clover, but it is most excellent hay. It is fine for horses; we feed a great deal of it. It is always bright and green in color, and it comes out free from dust.

Mr. Church—Does it carry as much protein as clover hay?

The Chairman—I think not, but remember this point, that if you are cutting oat hay that as the oat crop matures the protein seems to diminish so that if you wait to get more grain you will not have the same value in it. It is so with all kinds of plants. When the plant is green it contains more of the protein elements than after it is matured.

Mr. Taylor—Do you feed this soiling crop in the barn all summer?

Mr. Crossfield—Yes. We have tried to feed it out in the lane but we gave it up in a short time; there was too much wasted. I wish you would all try the oats and peas. I think you will find it will pay. I have fed oats and peas to my cows right along and they are doing as well as when I fed oil meal, and you can raise this kind of feed a great deal cheaper than you can buy oil meal. If it goes down, cut it for hay; you can

tell early enough how it is going to act to cut it in time. A good idea is to sow a strip around all other grain fields, a strip of oats and peas that you are going to cut for hay. That is cut early and your grain field is all ready to handle, and there is no loss in the cradling, if you sow a strip two or three rods wide.

Adjourned to 7:30 p. m.

Convention met pursuant to adjournment at 7:30 p. m. The president in the chair.

THE DIGNITY OF LABOR.

Miss Harriet A. Oertel, New London, Wis.

Within us and around us, have been implanted certain environments which have left an impression on our characters. From year to year we have stored our minds with knowledge, knowing that in the great race of life knowledge is power.

How one longs to do something, to be useful. We want continually some object in view; some work to pursue that we may have employment. We have thought long enough, now we will act. Of what use is labor to us? It is the means of building a character. It gives the man or woman a character that stands. Each nail he drives, each hammer he wields, is fastening in rivets that will shape his after life. He feels, and not only feels, he knows he is necessary to do his part of the work.

Whether at the desk, in the shop, on the farm, or behind the counter, he is drilling out his own destiny. Step after step he has climbed the ladder. That man has little ambition who leaves a business in the same condition he found it. I care not whether he be heir to millions or the only son of a widow, he may, with hands and mind, win a place in the arena of today. Though he be poor he may have ideals higher than we would ever conceive. "Though he may never realize his ideal, he may idealize a higher real," causing others to admire and strive to

follow the example of one who battled so bravely the stern unrelenting duties of life.

Have we many of these men today? Yes, but how few when compared to the countless thousands who realize their places could readily be filled by as many others equally proficient.

Parents should see that their children have some skilled way of earning a livelihood, else they may never be able to buffet the trials and temptations of life with no rudder to guide the journey. If there were more proficient laboring people and if such had a higher object in this world, a better education to back them, there would be less crime, fewer drunkards and many happier homes.

Christ himself labored and shall not we? Where men are employed Satan finds no evil for their hands to do.

We have enough riff raff, now we want the best, and it is only by educating the youth that we can attain this result. We are beginning to realize that skilled labor is the potent factor of today, the motive power that will herald a new era for the coming century. As a laboring class we are in advance of many nations, but still there is a great field of labor open to us, for in the social state of this country much must be reaped while few gleaners push the work.

Let us not bicker over common stock, division of dividend between capitalist and laborer, monopolies and social caste, but only aim to show, by our example, that we are all brothers in Christ Jesus, who taught us humility and was so lowly that he made the publican and sinner his companions. Rear our children not so much in creed, not so much in form, but that

> "True worth is in being, not seeming,
> In doing each day that goes by,
> Some little good, not in dreaming
> Of great things to do by and by."

The laborer is beginning to awake to the power there is in him and soon, ah! soon, we will find his knowledge is indeed a power.

Capitalists are beginning to recognize that the "laborer is worthy of his hire." Too long has he been ground down, too long has he lived in an attic and fed his children on starvation

wages. Century after century he has been held under until he judges all property holders as enemies, and surely he has no reason to think the contrary.

Among the laboring classes we find feelings of superiority of one set over another. Is not the girl in the kitchen, the boy in the blacksmith's shop, as much worthy of respect as the clerk, stenographer, minister or teacher? They are all servants, and it is only because of better parentage and broader advantages for mental development that we are supposed to be above others. True, there are some who are naturally dull, but we can trace much of this back to the child's ancestors where we find men and women who drank and debauched. Children have a right to be well born and well bred and it is the parents' duty to see that such is done, which if not will have to be made restitution for at the judgment seat. From this we see that the man or woman who debauches is but sowing the seeds for a harvest of drunkards in the coming generation.

Let us be known by our works; our emblems be typical of our orders. Let Faith, Hope and Charity stand for purity in thought, word and deed. Then the honest work done by us will shine steadily many years after we are gone. The world may grow old and gray, nations may rise and fall, but people will still admire the teachings of our lives, still follow the example of truth and justice.

The Chairman—Down in the southwestern part of the state lives a queer kind of a character. He is a granger, yard wide and all wool, educated at the state university, has become wealthy farming, owns five or six hundred acres of the best land in the state, and he has made his money feeding hogs. He is often called the hog man and he says that if he could live long enough he would buy the whole state of Wisconsin and convert it into one vast hog pasture. He is here with us tonight, and I am glad of it, for I am sure that he will interest you very much. I take great pleasure in introducing to this audience Thomas Jefferson Higinbotham Van Matre.

ADDRESS ON FARM TOPICS.

T. J. Van Matre, Fayette, Wis.

I will introduce myself to this audience by narrating an occurrence which took place in my boyhood days, showing that a nick-name, like a bad habit, will cling tenaciously to a boy through life. Many years ago, when we were boys together on the farm, we did the milking and we also attended to the washing of the milk pails and strainer. (We did this because there was more help out doors than in the house. In other words, there were more boys than girls in our family.) For this purpose we kept a large iron kettle standing down by the springhouse, and in the morning after the pails had been washed the water would be thrown out, the kettle replenished, and allowed to stand in the sun to warm during the day that it might be ready for use at night. This was before the discovery of kerosene oil, gas, and electricity. Candle moulds had not been introduced into our part of the country. We burnt a rag saturated with hog's fat. Later we burned dipped candles. Perhaps some of the older persons present here tonight can remember about those dipped candles. They were very irregular in shape, and unsightly to behold. One day we boys went fishing, and after we had gone mother found that her supply of candles was almost exhausted. So she concluded to dip, and as there were no iron kettles lying around loose at that time, she threw the water out of our kettle, put in her mutton tallow, built up a fire, and proceeded with her work. It was late when she got through, so she decided to leave the tallow to harden in the kettle that it might be taken out en masse. It was dark that night when we came home, wonderfully elated with a splendid catch of fish. We hastened out to do our milking as we were wont to do, and when we had finished, my brother Joe, whose duty it was to attend to the washing of the pails that week, took them and soused them in the kettle. It just then occurred to mother what she had been doing. She hastened out to the kitchen door and "hollered" at the top of her voice, "Joe, Joe, don't put those pails in the mutton tallow." But alas! it was

too late. The pails had been immersed, not in the name of the "Father, Son and Holy Ghost," but in the name of "Greasy Joe," a name which clings to that boy to this day, though he is a man past sixty years of age. In 1850 he crossed the plains and dug gold on the Pacific slope for two years, with hundreds of different men not one of whom ever knew him by any other name than that of "Greasy Joe." And after his return to the Badger state, I took many letters from the postoffice directed to "Greasy Joe," Mineral Point, Wisconsin. I wish to admonish you boys never to contract the habit of using tobacco and beer, for if you do, you have contracted a habit which will cling to you through life as tenaciously as did this nickname to my brother.

The very kind reception which I met at your last annual convention induced me to become a member of the State Association, and accept the kind invitation of your president to be present at this twenty-third annual convention. And as I was comfortably seated in a palace car with its complete equipage, steamed across the beautiful expanse of country which intervenes between this place and my own home, showing unmistakable evidences of the intelligent application of thought to agriculture, and the breeding and care of stock, I was brought to exclaim, "What a change!" What a happy change has taken place in the easy recollection of your speaker. For I had once known much of this section of country as an unsubdued wilderness, inhabited by roving bands of Indians, without wagon roads, much less railroads. Volumes would be required to record the advances made along agricultural, educational and industrial lines since my eyes first beheld the light of day in the territory of Wisconsin. And as my mind goes back along the path which I have trod for more than half a century, there comes up before me evidences of thrift and prosperity made possible by the adoption of right methods in farming, while on the other hand the way is strewn with wrecks caused by the adoption of slip-shod and unbusiness-like methods. I take much pleasure in seeing public opinion daily assuming a more intelligent and determined attitude in regard to the adoption of better methods in farming. An ignorant man can never become an ideal farmer. Neither can he become a valuable citi-

zen under a republican form of government like ours. This is the conviction of thinking men of today. And this conviction has led many good men to undertake the education of the masses along the line of better methods at no small sacrifice of time and means. We sometimes hear our agricultural college, farmers' institutes and their methods severely criticised. But as a rule these criticisms are prompted by prejudice, ignorance and shiftlessness. An indolent farmer never cares to listen to the gospel of better methods, simply because it is easier for him to float with the current than to turn around and paddle against it. A life-long experience has taught me that farming, to be made profitable, must be conducted on the most exacting plan of economy in every department. The work must be done at the proper time, and with the least possible wear and tear of muscle. I am not disposed to contradict the fact that half a century ago farmers, ignorant of science, made a good living, and some of them laid by a little money, but then the country was new. A virgin soil loaded with fertility produced most excellent crops, which sold at remunerative prices. The habits of the people were more simple at that time; they raised almost all they ate and wore. Their wives and daughters had no ten-dollar hats, twenty-five-dollar dresses, and fifty-dollar cloaks. Linen, wool and yarn, manufactured in the home, supplied the inmates with clothes and bedding. I know this was so, because I was there and grew up amidst these surroundings. Neighbors were neighbors indeed. They looked after and consoled each other in sickness, visited each other in health, and aided each other, when able, in financial distress. If one neighbor had a hundred dollars and another needed it, it was passed over and not a word said about note or security, and when wanted was paid, usually without interest. I have known my father to lend hundreds of dollars in an early day, without the scratch of a pen to attest the fact. And those same men who borrowed them would not now lend a sum of money without a note bearing interest with good security. I do not pretend to claim that the people were any more honest or obliging then than now, but they simply had a different way of expressing it. Their equality in worldly matters made them all feel rich. They were happy in spite of their poverty, and

not because of it. And I believe the pioneers of a new country, though they work hard and suffer many privations, are the happiest people in the world, because they are honest, with hearts full of love and gratitude for their neighbors for miles around. I can but compare the present aristocratic and unfriendly feelings of the people with the customs and habits of a generation ago. It was the custom of our foremothers, after they had cleared away the breakfast dishes, to leave the further discharge of the day's duties with their older daughters, don a new linsey dress, take their knitting to some neighbors, and spend the entire day in friendly conversation and mutual encouragement. They seemed indeed to have enjoyed themselves. Their conversation did not hinge on some "new fangled sleeve" pattern, some new style of hat, or possibly upon some neighborhood gossip, but rather upon the best mode of making butter, or upon which were the most profitable fowls to keep. The list was not so extended then as now. They did not have the Barred Plymouth Rocks, the White Plymouth Rocks, the Laced Wyandottes, the White Wyandottes, the Golden Wyandottes, the Black Java, the Light Brahma, the Dark Brahma, the Langshan, the Partridge Cochin, the Buff Cochin, the White Leghorn, the Brown Leghorn, the Hamburg, the Black Spanish, the Houdan, the Indian Game, but they did have the old Pumpkin Red and the Dominique, which would lay as many eggs in 365 days, Sundays excepted, as any of the more modern breeds. They took particular care in preparing their daughters for good and efficient housewives. They were taught to sling the pots and kettles, milk the cows, and make home generally cheerful. They were taught how to set a table with few dishes so as to make it pleasing and attractive to a hungry household. Modern belles know but comparatively little about these things. They are taught French and German, music and rhetoric, and just how low to bow when saluting company. And while these things are all very good in their place, they will never appease hunger, or make a home what a home should be. Hundreds and thousands of miserable, neglected and unhappy homes may be found in this country, simply because the domestic education of our girls has been overlooked. How many young ladies present here tonight, contemplating matrimony (and I hope you

are all contemplating that event, because there is but one more undesirable class of people on earth than the "old maid" class and that is the "bachelor" class), I ask how many young ladies here tonight are familiar with the mysteries of domestic life? Do you say you will never be obliged to milk the cows and attend to the kitchen drudgery? I say you have no assurance of this matter, whatever may be your present financial standing. "We know not what a day may bring forth." The proprietor of an enormous retail business in the city of Chicago told me recently that a large proportion of the women and girls employed in his establishment began life in prosperous and comfortable homes, with the expectation of permanent ease. But the death of a father or husband, fluctuations in stocks, or some other business reverses left the familes penniless, and now they stand behind the counter twelve or fifteen hours each day, under the eye of an exacting task master, and sell goods to keep the gaunt wolf of hunger from the door. If I were able I would change the public sentiment so radically that no young girl should be considered well educated until she had mastered some business, trade or profession. Self-support would then be possible in time of need, and she would not float upon the current of life, borne hither and thither by its uncertain flood, a part of its useless driftwood. I believe that every great institution of learning should have in connection with it a manual training department, and our children should be taught some trade or profession, so that in the event of loss of fortune they might not be left wholly dependent.

Many avenues are now open to men and women which were unthought of in my boyhood days. Young people wishing to engage in business now have advantages exceeding those of any generation before them. They live in an age and in a country where every success is possible; where men and women may make themselves almost what they choose; where energy, enterprise and business integrity are appreciated, and a market is always open for good wares. In our day and in our country men are called upon to do what men never did before. Everywhere is met a spirit of investigation, inquiry and experiment. In politics there are new tasks, in com-

merce shifting currents, in science colossal developments, in education new methods, even in religion new attitudes are being assumed. And if we as farmers do not keep pace with the advancing progress of the age, in the great struggle for the survival of the fittest we may be left. A party policy which was all right in our grandfather's times will not meet the changed conditions of our times. The small vessels, which breasted the unknown wave four hundred years ago, and planted here in the western continent the seed from which has sprung the most powerful and opulent republic upon which the sun ever shone, would not meet the demands of modern commerce. The telegraph, the telephone and the lightning express have taken the place of the post boy and the old mail coach of three score years ago. The old log schoolhouse, with its primitive methods and antiquated teacher, has long since given way to modern structures, with modern methods to meet modern demands. Primitive Christianity, that worshiped under the canopy of heaven and soundly denounced jewelry and fine apparel as devices of the devil, calculated to deceive the very elect, now worships in splendid cathedrals, bedecks itself with diamonds and jewels, clothes itself in silks and satins, and the world says, "Amen! and Amen!"

As a boy I was taught to swing the cradle, scythe and flail, and if my accounts at the close of the year showed a balance of one or two hundred dollars in my favor I was happy indeed. My boys reap their harvest with a twine binder, cut their grass with a steel mower, and thresh their grain with a steam thresher, and if at the close of the year their accounts do not disclose a balance of one or two thousand dollars in their favor they soundly denounce the trusts and combines of our land. This all goes to prove that the world does move; that we live in an age of progression; that we are passing from an era of muscle to an era of brain. The fertile mind of genius has been touched by the magic wand of thought. And while this all tends towards a higher consummation, we must remember that there is a certain amount of physical drudgery which must be performed. The man who mixes the mortar and carries the hod may be despised by the master masons and decorators whose works are seen and applauded by men, but the architect

who gave him his work knew that without his help the temple could not have been reared; and when the great day of reckoning shall come his reward will be sure, for the "laborer is worthy of his hire."

I hope no young man will permit himself to be diverted from his intention of becoming a farmer by the senseless remarks of those who claim to be engaged in the higher walks of life. There is no business which antedates farming; and history, ancient and modern, sacred and profane, unite in proclaiming it the most honorable of occupations, though we must remember that it is not the business which dignifies the man, but the man who must bring dignity to his calling. Many farmer boys are now undecided whether to leave the old homestead and press their way into the crowded city, there to engage in the severe and uncertain struggles of a business life, or to remain upon the old farm, adopting agriculture as their life work. These boys like the farm, and hesitate to adopt farming as their life work, only because they fear the returns may not be commensurate with the efforts put forth. But if the great financial troubles which have recently swept over this country, have proved one thing more conclusively than another, they have proved the uncertainty of business ventures in the city, and the certainty of confidence, comfort, and the best things of life to those who sensibly and systematically follow farming. Each day develops the fact that education and training pay on the farm as they pay elsewhere in life. And other things being equal, the young man who fortifies himself by a thorough agricultural education will succeed much better than he who neglects this precaution. If we study the history of men who have figured most conspicuously in the affairs of this nation, we will find that a large proportion of them had their early training upon the farm. It is true today, that the farm is the best school for the training of capable young men, that exists in this country. It may be otherwise where we do not find a class corresponding to the independent American farmer. The farmer boy is learning real things. The great book of Nature lies open before him, while too often the city boy is learning from the printed page only the pale reflection of things. The farmer boy learns early

about land and soil; about crops and their rotations; about the seasons and the weather. He becomes familiar with domestic animals; he owns a pig or a calf; he has a favorite horse; he rides wild colts; he feeds and milks the cows; he hunts with a gun, and goes fishing,—in short he develops a strong physical constitution which must accompany a bright mind. The farmer never gets out of a job. I think you will all bear me out in this assertion. There are no strikes, and he who has a family to support is saved a great deal of worry and anxiety, for his income though small is nevertheless sure. There is cause for congratulation on the farm these hard times, when so many of our fellow-men are out of employment in the factories and in the mines. And if we only do our duty by this, a God given, land, we shall never feel the cold palsied touch of the hand of beggary, or be obliged to listen to the pleadings of the thin white lips of poverty. We may never become millionaires; but the strength of this nation does not rest upon its millionaires but upon its six million yeomanry with their happy homes. Whatever builds up and strengthens the homes of this nation builds up and strengthens the nation. And I believe the more evenly the wealth of this country is distributed, the better it is for all concerned. Concentrated capital is subjugating everything. It has gagged the press, it has corrupted legislation; it has bought judges; even our great institutions of learning are not free from its contamination. Its grip is upon the church. Go where you may you will find the people paralyzed with their own impotence. We know this from the oft repeated expression heard, "You can never legislate against combined capital." What! a nation who in her infancy laid the proud British lion prone at her feet, not now in the strength of her years able to cope with a few thousand millionaires? What idiocy; what blindness! This spectral phantom of our land, this devil fish, with its innumerable arms which cut like a scalpel, and suck like a cupping glass, this loathsome horror of vampire death lurks on every hand to seize the earnings and destroy the life of the unfortunate who come within its grasp. It winds around its victim, covering and enveloping him in its slimy folds. It is a hideous picture of loathsome disease and clings closely to its prey. It is spi-

der in shape, but chameleon in the rapid changes of its political hues. But yesterday it was democratic, today it is republican, tomorrow it will grapple for the throat of the people's party. And if we do not bestir ourselves, from the same golden altar upon which every ancient republic has been immolated, will ascend the smoke of sacrificed American liberty, and a despotism the most damnable, ruled by this money oligarchy, will be the sequence. Call me a radical if you please. I am proud of the title. Moses was a radical, Christ was a radical, Luther, Litmer, Hesse, Ridley, Phillips, Lovejoy, Old John Brown, William Booth, and Dr. Parkhurst were all radicals. And I challenge you to point me to any reform that has taken place in the history of nations, which has not been the outgrowth of extreme radicalism. The time for conservatism has already passed. It passed when concentrated capital denied to honest toil a just compensation. It ceased when the gold bugs of this nation spread their gaudy wings over our national congress, and said, "Thus far and no farther." "Honesty," my friends, "is the best policy." At a slave sale in one of the southern states, a great many years ago, a smart, active colored boy was put upon the block. A kind master not wishing to see him become the property of a cruel owner, went to him and said, "Sam, if I buy you will you be honest?" With a look that beggared description the poor colored boy made reply, "I will be honest, massa, whether you buy me or not." Friends, we are in need of thousands and millions of just such men and boys as was this poor colored boy. Men who will be honest with themselves, honest with their fellow men, and honest with their God.

Adjourned to 9:30 a. m. next day.

Convention met pursuant to adjournment at 9:30 a. m., February 14th, 1895.

The president in the chair.

STABLE MANAGEMENT OF COWS IN WINTER.

C. L. Hill, Rosendale, Wis.

I would divide this subject into three heads: First, the stable, second, the care of the stable, and third, the care of the cattle. The stable should be so arranged as to be convenient for the every-day work, and all plans should center around this idea, as the amount of labor required to do the necessary chores will largely depend on the arranging of the stables. If any are going to build new barns, I would advise visiting several good dairy barns and carefully noting the good points and defects also. I would profit by others' experience.

You will find that a stable made of two thicknesses of boards with paper between will be dryer and warmer than a stone basement. The model arrangement for a rectangular barn is two long rows of cattle facing each other with a chance to drive on the feeding floor and also behind each row of cattle so as to easily remove the manure. Make the barn larger than you now think you will need or else plan it so you can build onto the end as it is needed.

By all means have a silo so situated as to be convenient for feeding. Have plenty of windows, in fact, have the south side largely glass. In our barn I have often noticed this winter if the sun shines at all it will shine on all but one or two at a time for the entire day. Have the stable so arranged that in case of weather 30 degrees below zero it can still be shut up so it will freeze very little if at all. If an old stable, line it with paper and another thickness of boards. Don't go to the other extreme and shut it up so it will fairly steam when you open it. Some box ventilators running from near the floor up out of the ceiling will be an excellent way to keep the air pure. The ventilators can be made by boarding up between two of the silo studs down to within a foot or two of the floor. Let each one decide for themselves what kind of a fastener they will use, but let it be something that will keep the cattle reasonably clean.

The much condemned rigid stanchion is generally used and will answer in most cases. If you use this make the floor the cattle stand on vary in length from 4 to 5 feet as there will be that much difference between the smallest heifer and the largest cow. Have the gutter 16 inches wide at least and 6 inches deep. If possible have the walk behind the gutter wide enough to drive a wagon or sleigh through and draw the manure direct to the field.

The manger should be about 24 inches wide and the feeding floor six inches above it, and the ceiling 6 1-2 or 7 feet above the feeding floor. There are a few essential things in the care of a stable, and a couple of heavy brooms are almost as necessary as a fork.

Our feeding floor is swept every morning after milking and it adds a good deal to the looks. Then if the cattle leave anything at all the mangers are all swept out while the cattle are out to drink. After the stables are cleaned and bedded the walk is swept into the gutter. Another use for the broom is to occasionally sweep the ceiling and sides of the stable thoroughly so as to remove all loose dust and cobwebs, thereby removing, according to Prof. Russell, one of the chief causes of bacteria. Use plenty of good clean straw for bedding. It will pay in the end, I believe, to cut all the bedding if conveniences are at hand for so doing. It will then make a better absorbent and make the manure finer which is quite an object if it is to be used on corn land. Be sure your gutter is water tight and use road dust, sifted coal ashes, chaff or sawdust, to absorb what liquid the straw doesn't take up. I would also use land plaster by sprinkling a few pounds over the bedding just before each milking. If you have never used plaster in this way you will be surprised to see how much better the stable will smell. It is also a great saver of ammonia as the chemists will tell you.

These precautions to save the liquids will greatly enhance the value of the manure as the fertilizing elements are worth four times as much in the liquid as in the solid excrement—that is, from a given weight of each. The chief virtues of the care of cattle are kindness and regularity.

Have regular hours for milking, feeding and watering. Don't

milk this morning at 5 o'clock because you are in a hurry to get to work and tomorrow at 7 o'clock because it is Sunday or there isn't much work to do.

I don't like to see every animal jump up every time the owner goes into the stable as if they expected to be fed. If you feed them regularly you won't disturb them if you go in the stable between times. Plan your work so there will be a time both morning and afternoon when you can leave the cows to their dreams.

Be kind to the cattle both young and old at all times. A piece of rail or a milking stool will make a very poor curry comb.

You had better have to push a cow out of the way once in a while than have to chase them all over the farm when you want to catch one. Anything that tends to disturb them will disturb your profits.

We had a couple of chances to prove this this winter. Mr. John Decker was at the farm testing a cow and one day he wanted to take a picture of her. She became excited and showed it that night especially in the quality of the milk.

Week before last there was a farmers' institute at Rosendale and at noon several strangers went to the barn to look at the cattle. Some of the men wore fur coats and the cows were all more or less excited and some positively frantic. Three of them were scouring in less than half an hour and it took most of them a couple of days to get over it.

If the time can be spared it will pay to card and brush the cattle and at least it will make them like to have you around them. Salt them each day, or better yet have salt where they can have constant access to it. Our cattle are not out of doors long enough to get what salt they want from a box at this season of the year so I salt them each morning in the barn.

Our cattle go out about 10:30 o'clock each morning to drink and give us a chance to clean up the stable. Some prefer to water in the barn, but from all I know about it yet we shall not adopt this method.

They go 60 rods to a spring to drink each day and I yet see no ill effects. We have a tank and a good heater but haven't used them for several years. We would do so though rather than

have them drink ice water. Ours is a breeding herd as well as a dairy herd and we think the pure air they get in this way does them more good than the cold does harm. However, they are not allowed to stand out of doors and make camels of themselves when they get back from the spring. They have seldom been out over thirty or forty minutes on stormy days, and often less.

We must avoid tuberculosis by seeing that the cows breathe good air only at all times.

Yearlings and dry cows are out longer and exercise is good for them. It will take a little more feed to keep them in good shape but we are sure their constitution is stronger when they have to bear the closer confinement due to maternity and supplying milk these cold days.

The bulls must also be exercised in some way and I much prefer working them in a tread power than leading them around. One of our 6-year-old bulls has run the separator for two years and is in the pink of condition all the time. He is kinder and more vigorous and sure than before we worked him. The other bull has so far defied all efforts to make him work, and he is out of doors for a while nearly every day. If you don't work them, turn them loose occasionally.

Have a love for your business. Study the wants of every animal and try to supply them.

You must be enthusiastic if you wish to be successful; in fact, don't be afraid to be called a "cow crank."

DISCUSSION.

Mr. Rust—Mr. Hill, do you prefer the bottom of your manger on a level with the floor, or would you raise it?

Mr. Hill—It is on a level with the floor that the cattle stand on.

Mr. Rust—Wouldn't you rather have it a little higher?

Mr. Hill—I wouldn't want it very much higher. Perhaps a couple of inches would be an advantage, but I wouldn't want more than that.

Mr. Rust—I have found that in raising it about four inches the cows can then reach to the further side of their manger and they will not slip and bruise their knees as easily.

The Chairman—Does the cow lie down with ease and comfort where you use the rigid stanchion, and the manger higher than the feeding floor?

Mr. Rust—I built a new barn and I have a new tie so I have taken the stanchions out and my cows can now lie down with perfect ease. They can have their heads in the manger or in the side of it.

Mr. Burchard—With stanchions you can raise your feeding floor four inches above the floor that the cattle stand on. They can lie down in stanchions just as easily as when the floor is level, and it prevents a good deal of unnecessary reaching and straining.

Mr. Taylor—How about that new tie, Mr. Rust?

Mr. Rust—I have got my manger about two feet wide, then we have a joist running lengthwise in front of the cow and between them is a scantling set up two feet and a half and sixteen inches apart, that goes between the cows, and there is a rod that fastens with screws on each side of the cow and goes down into the joist. There is a ring on that with two chains to either side, that slips up and down and it has a swivel with a chain around their neck, and they can swing around and lick themselves—any part of the body and they seem to be at perfect ease and comfort. It is a cheap tie.

Mr. McKerrow—Mr. Hill mentions the fact that excitement changes the product of his cows. How does it change this product?

Mr. Hill—I was so busy I couldn't test it at the time the farmers' institute was there. When Mr. Decker was there it affected it more in the quality even than in the quantity. At the time of the farmers' institute one or two of them did not give any milk that night to speak of.

Mr. McKerrow—That is pretty hard on a farmers' institute.

Mr. Grengo—I had an experiment in that line last winter. We have a cow that is hipped and it is natural for her

to stand with one foot forward, she seems to stand more easily in that position. In milking her I wanted her to stand with that foot back, and I had some trouble to make her do it. I got a little angry with her, I thought I would make her do it anyway, so I gave her a kick in the shin. I didn't kick very hard, but it was sufficient to produce an effect. The day previous to that she gave twenty pounds and twelve ounces of milk and it tested somewhere about 5.4 per cent. On the day that I gave her this kick she gave exactly the same quantity of milk, but the test was down nearly to four per cent. Prof. Robertson's theory on this, I believe, is that the butter glands are more sensitive than the veins that produce the milk, and that certain excitement will prevent the working of the butter glands, and that if it is continued farther it will stop the working of the milk glands.

A Member—You felt that kick, didn't you, as well as the cow? Didn't it affect the quantity of your butter some?

Mr. Grengo—Yes, certainly.

Prof. Haecker—We have tested every cow in the Minnesota dairy herds for over three years now, weighed the milk, tested it and observed the changes that took place. We find that some cows when they become excited, from one cause or another, will shrink in the flow of milk and increase in the per cent. of fat. We also find that others will simply increase in the per cent. of fat. Any disturbance whatever may change the milk one or more per cent. Again, we find that cows will show such changes without any apparent reason for it. Last fall I was conducting an experiment and taking daily observations of the flow of milk and the per cent. of fat in the milk. Of course, we take a daily test, but I don't always examine it every day. During these experiments I was specially interested, and I examined the daily results, and I was surprised to see the variation. It was not unusual to see a change of two per cent. from one milking to another where everything was quiet, everything going on in its regular way, so that if we find that a cow happens to get a little startled and will test .25 of a per cent. less it may not be that that causes it; it may be some other reason. So it is not well to arrive at these conclusions too soon; sometimes a cow for a certain period will

show a great variation in the flow of milk, and we cannot account for it at all.

Mr. Grengo—That is all very true, we can't see everything that goes on in a cow.

Mr. Burchard—One of the most remarkable instances of variation, both in quantity and quality that I remember to have heard of, was reported not long ago by Mr. Gurler, from the Illinois station, a cow that they called "Josh." She would jump about in quantity and quality with the most irregularity in variation that I ever saw reported. Mr. Gurler is one of the trustees of the Illinois University. He went down there afterwards and found that the cow was behaving better, and he inquired of the herdsman as to the cause, and he reported that he had learned between the former visits and that which Mr. Gurler made at the institution, that the cow had been accustomed to eating when she was being milked, and when the herdsman would commence the same kind of care at the university the variations ceased. All of which seems to indicate that in a very marked degree the nervous condition of the cow at the time of milking has a great deal to do with the elaboration of the milk, both as to its quality and quantity, so that the instance cited by Mr. Hill is explainable, that cited by Mr. Grengo is explainable, and probably if we could only get at all the facts nearly every instance of that kind is. We don't know what may start it, we don't know oftentimes what excites ourselves, but we feel in an unsettled and nervous condition,—are not quite ourselves. It is so with the cow.

Mr. Barnes—I wish there was some one here who could say a word in favor of these round barns. I believe there are a good many men in this vicinity who are calculating to build. I am going to build one myself, and I think I would surely want to build a round stable or barn. We have one in our immediate vicinity that has been used for two winters, and its owner prizes it very much. I am a new member in this Society, and I would like to see some attention given to this point. This gentleman at Waupaca, Mr. J. M. Ware, I am sure would be glad to give any information on the subject. He has a silo in the center, and his cows face the silo, round and round. His

arrangements for storing dry fodder and everything else seem to be very handy and convenient.

Mr. Allen—May not the changed condition in the milk be accounted for in large measure by the physical changes in the cow? For instance, when a cow is coming to heat, or immediately after, she is in a fevered or excited condition, and my experience is that there is a great change at that particular period in cows giving milk. I think if people would give a little more study to that question they would be more careful how they would allow cows to become excited under those circumstances.

Mr. Taylor—I think that we as dairymen ought to study these points that affect the quality and quantity of the milk more than we do. I don't know that we can ever get at the bottom facts of these things, but our observation should teach us better methods and closer practices along many lines. Now, it is true that certain conditions produce quite a change in the quality of milk. If you want one of the best records that has ever been kept along this line, you get the report of the official test made in Chicago two years ago. You can get them by simply asking for them, and there were 150 to 200 tests made daily. You will find there just the quantity and quality each cow gave at each test from the beginning to the end. You will find that those cows were all handled alike under the same general conditions, and you will be surprised to find in studying the per cent. of fat that some one cow gives that it varies from 3 1-2 to 8 per cent. from day to day. One cow that I am very well acquainted with and followed her test from day to day, one day gave 8.41 per cent. of butter fat, and the next gave 3.4 butter fat, but she made a good average after all. What the conditions were no one seemed to know; all those professors there couldn't explain it, but the facts remain. I have a recollection of another cow which Mr. Haecker will remember, Mr. Foster's cow at Plainville. She came to my farm two or three months before going to Chicago, to get acquainted with two or three companions. When she came to my place she was giving about twenty pounds. Mr. Foster says, "I wish you would feed her when you milk her, or she won't give her milk." I did so, and he sent me several letters asking me to be sure and tell Mr. Fuller to keep up this prac-

tice of feeding her, and he explained that he had frequently tried the other way, but that she would hold up her milk. He knew she was a good cow, and he got into the notion of feeding her while he milked her. She made him 712 pounds of butter in a year. When she went to Chicago, after being dry for several months, she came into milk, and they forgot to feed her in that way. He saw the report. He wrote to the chairman of the committee, and he says, "Are you feeding her while you milk her?" He answered back, "No." Then he says, "Why don't you? I told you to." And they said, "We treat them all alike, and didn't think it was necessary." Well, he went to Chicago, and he says to Mr. Fuller, "I want to take my cow home; she will be dry before the test is over unless you do as I have been doing, she will dry up and be no good. I shall certainly take her home unless you feed her as I told you to." Mr. Fuller said, "Why, we thought we'd break her in all right." But Mr. Foster said, "Well, you will break her neck, at least you will break her milk-giving capacity unless you do as I tell you." Then they went to feeding that cow and handling her as Mr. Foster wanted, and she came out seventh in that test. I know that cow would have been third or fourth if she had been handled as Mr. Foster wanted from the first. This teaches us that we must be regular in feeding and handling. These cows are ready to give their milk, and they want you to milk them, but they must be fed at the regular and proper time. If you are in the habit of milking Bessie first and Daisy second and the next one third, do that every day. As you walk behind the cows with the pail on your arm, the cow that is to be milked first will step right along, and then the next one will be ready. They are more regular than we are. If we do not observe this regularity we must look for its effects in the product. Another thing, it takes the same carbonaceous elements to make milk that it takes to keep up animal heat; we know that, so that if you force them to go out in the cold you may expect the butter fat to be reduced. It takes the same protein elements to produce muscles, therefore we don't want them roaming all over a cornfield to get something to eat. You can see the economy of keeping them quiet and warm.

Mr. Barnes—Mr. Hill, which do you recommend, feeding first or milking first, or feeding and milking at the same time?

Mr. Hill—I feed and go right to milking. I couldn't recommend anything else, or say which would be best, because that is the way I do, and I don't know about the other way. I want to say one more word in the line of what Prof. Haecker said. I have not tested the whole herd of cows every day right along, but I have for a month or two months at a time, and there are some cows that will hardly vary a half of one per cent. in the whole time, so you cannot always lay it to excitement. It seems to me in my tests that if there is some excitement that causes the change, the change will cause some excitement afterwards. I mean when there is a great change I look for some excitement the next day.

Mr. Noyes—I would like to speak from the factoryman's standpoint. A great many dairymen handle their cows most any way, and change feed most any way, and feed regardless of results, and factorymen who are paying by the Babcock test have to take a great many curses for the test. They will come to you and say, "Why don't my test run as it did last week?" Their cows have had altogether different treatment and yet they expect their milk to test just the same. I think that patrons should look into this. A factoryman will have great trouble in getting along with the Babcock test if his patrons don't understand these things.

Mr. Rust—In my herd of cows I have never milked while they were feeding. It seems to me that the cow would step backwards and forwards and the men would get out of patience and hammer at her, and in that way I would get kicking cows. I have always made it a practice to milk when the cows are not feeding. I never have a kicking cow.

Mr. Grengo—I don't believe it makes any difference whether you milk while they are feeding or before or after, as long as we do the same way all the time.

Mr. Meyers—According to my experience it is better to milk a cow after she is fully fed.

A Member—The feeding has a good deal to do with the cow. Give them strong feed and they will give a good test. I have found that the cows that are not giving much milk won't test

good, and those that give a good quantity of milk have a good test. One of mine gave 2.7 while another gave 4.1 on the same food and same care. I believe it is better to milk the cows before you feed them so they won't be moving backwards and forwards.

The Chairman—What is your experience in this regard, Prof. Haecker?

Prof. Haecker—We have simply followed one course. We have a regular schedule in our barn and everything is done to the minute, feeding at 5:15 a. m., and every cow in the barn knows that at that minute a man is going to come in and in three or four minutes more he is going to have a feed before her. I noticed yesterday afternoon, I was in the barn, and I was giving some directions before leaving, and the boy was four or five minutes behind time, and nearly every cow in that barn was beginning to low and get fidgety. I don't think it matters much whether a cow is fed before or after milking, but she must be fed the same way all through the season. Another thing affects this matter, and that is change of food. If I get a cow accustomed to a change of food in one week I think I am doing pretty well.

The Chairman—Mr. Burchard, give us your experience.

Mr. Burchard—I haven't any experience on this point, because we always do just one way. The first thing is to go and feed the cows in the morning and then commence to milk, and after milking perhaps they are fed again; that is to say, they would have two or three kinds of food. If we feed silage and a little hay we don't give it all to them at once, but we give them something and go right to milking. I want to put in here something that will help to complete the record. So far as I know, the first positive demonstration in regard to the effect of excitement on the yield of cows, both as to quality and quantity of milk, was made by the secretary of this Association at the state fair in Minnesota. It was several years ago, and was the first official, positive demonstration in that line.

Mr. Hill—When Mr. Haecker says "be regular and kind" he says pretty nearly all there is of it.

The Chairman—It is your opinion then, Mr. Burchard, that

you get better results by feeding before milking than you would by feeding after?

Mr. Burchard—I haven't tried the other way; but I have this general idea that the best thing for the cow, when she is elaborating and giving down her milk, is to have her mind well occupied with something, and I don't know of anything that will really interest the cow better than something to eat.

Mr. Taylor—That is my opinion also, and I will state my method. The first thing in the morning we feed them two or three pounds of hay, not a full feed. Then we milk. After breakfast we feed their grain feed, after that their corn silage, enough to last until they are turned out. Then they are turned out and the stables cleaned and the mangers cleaned thoroughly; if there is any indication of sourness about those mangers, they are scalded. After dinner they are fed corn silage. In the evening they are fed their grain ration; then they are fed hay and dry corn fodder and this is a very regular ration. We give them about twenty-five to twenty-eight pounds of organic matter daily, which is thirteen or fourteen pounds of digestible organic matter, and we keep that up all winter. If we make a radical change in the feed we notice an immediate change in the quality of the milk, but it only lasts a few days. Even if the change continues we find they come back to the full quality and quantity of milk in a day or two.

The Chairman—I have been trying to make the point clear to this convention that regularity pays and the concensus of opinion seems to be among the good dairymen here present, that it is best to feed before milking, that we will get better results than by feeding after, or by feeding before one day and after the next.

THE DAIRYMAN AND THE HOG.

A. Selle, Mequon, Wis.

I was invited by President Everett and Secretary Curtis to be present with you at this convention and read a paper on "The Dairyman and the Hog." Now, as I see so many experi-

enced dairymen present, and should I attempt to say something on the cow question, I am afraid you would soon get tired and go to sleep.

Whatever induced Mr. Everett to put my name on the program for this subject, or any subject at all, I do not know; and why I accepted, and agreed to write an essay is equally unaccountable, unless you attribute it to cheek.

Cows and hogs should go together. This is a proverb of the dairyman, and is also used by prairie farmers who are fattening cattle that are almost fed exclusively on corn. There the hogs are kept to follow the cattle, and economize the excrements of them. They seem to do well on that diet and keep them healthy, as they will have more or less exercise and a variety of food so necessary—corn, and corn or grain, soaked in the cow's stomach. But whether the meat will have the right appetizing sweet flavor is a question which I will leave to somebody else to answer.

The hog that is best adapted for that style of feeding, I should think, is the old type of Poland-Chinas. It is altogether different with the wide awake dairyman who will make the breeding and feeding of good swine an adjunct to his dairying operations. With his skim milk he should be able to produce swine with a very muscular system, flinty bones, and general quality, and will surely excel those produced by some of our most intelligent professional breeders. The dairyman has a good many advantages. One point is, he can fit up his hogs especially adapted for breeding purpose. We hear complaints almost from all parts of the country that the hogs only get small litters of pigs, and the swine are growing finer in bone and lacking in constitution and vigor, and that they are not so healthy as in olden times, and when once attacked with any disease will often succumb in a short time.

The tendency of the hogs raised in the corn states is towards fineness of bone and a weakening of the muscular system, caused by feeding from birth to maturity on too much corn. This could be easily remedied by feeding more nitrogenous or muscle-making food, which is milk and clover, but to teach most of the farmers how to feed it to advantage seems to be a difficult task. No matter how much pains is taken in selecting

breeding stock, but if those animals are not fed the proper food, such as will maintain the bone and muscular system of the animals, the result will be degenerating of stock, often of a dwarfy appearance.

Another point is, he can arrange his hog business so as to raise two litters from a sow each year, and wean the pigs at the age of about six to eight weeks, and feed them middlings or corn meal and a slop made of skim milk, for there is no food for little pigs that will take the place of milk. He will not be compelled to let the pigs suck the dam so long that sometimes the pigs seem to be larger than the mother. Many farmers seem grounded in the belief that it is not profitable to raise two litters, and pigs could not be made to grow materially in winter. Dairymen readily see the force of taking good care of their cows in cold weather, and the same principle of care and feed that makes cows yield milk in winter will also make pigs grow rapidly from December to May. Of course a dry, warm stable, not an open yard, and plenty of nutritious food, are needed to bring about this result. It is impossible to obtain sweet-flavored, cheap and profitable pork from nasty food and exposed pens.

If I was given the choice of any one kind of food to be fed to hogs alone I would take skim milk. But there is no one food that can be fed so profitably as a combination of foods. Now, in regard to chemical analysis, we all know that skim milk stands not very high. Indeed, I am unable to give its proper ratio in figures without looking it up in some book, and you will surely know better than I do. Yet I am sure that the breeders and feeders present will sustain me in the assertion that as an auxiliary food its value is far beyond that accorded by the professors of chemistry. It is claimed that skim milk contains so much water, yet we have the undisputed evidence before us that if fed in connection with some other concentrated foods, and to the right kind of stock, is capable of producing often astonishing results.

But why is it, that we obtain such satisfactory returns when feed is mixed with milk? The only reason I see is, if we feed too much concentrated food, that more or less passes through the animal's stomach undigested. If milk is added this will

act as a corrective, and get the bowels in proper condition, and strengthen the digestive organs, and therefore the grain is better assimilated and digested, and we know that digested food is what brings profit. Also other less nourishing food can be made more palatable by mixing it with skim milk.

To feed skim milk while yet sweet or have the same lobbered first, is yet a matter of different opinion. From my childhood, I have fed the milk curdled, also the teacher under whose instructions I graduated as hog-feeder, and the one with whom I took a long course, always preferred the lobbered milk to the sweet skim milk; or thin partly sour milk, especially for sows suckling pigs. This fact can only be based upon the reason that by curdling all germs of disease, bacteria, etc., are destroyed, that the professors and chemists claim to have found in the milk.

It has been asserted that by boiling the milk those germs and bacilli, etc., would be destroyed. As the boiling of the milk seemed to be so troublesome and expensive, we allow the skim milk to get curdled entirely, and think that the lactic acid developed by the curdling process kills all or most of the bacilli contained therein. It is also well known that bacilli thrive best in any filthy fluid, and that acids are used as disinfectants. In summer from thirty to forty-eight hours are sufficient to curdle milk; in winter, warm water may be added, or the milk placed near a stove for this purpose. The vessels in which the milk curdles must be cleaned often to prevent the accumulation of decaying matter.

The lobbered skim milk also prevents the formation of casein lumps in the stomach, especially in calves, on which so many of these animals have perished. It is also a fact that by curdling many kinds of bacteria are destroyed, some of which are capable of forming gases, and generate flatulency in the intestines; others again irritate the intestines strongly and produce diarrhoea. This explains the fact that it is better to feed to pigs and calves milk that is lobbered entirely, and is just acid instead of milk that is half sour and bitter in consequence of too long keeping, and therefore has become saturated with what chemists call bacteria.

The casein lumps of the unboiled sweet skim milk are often the cause of the ruin of many calves and pigs. Sweet skim milk, if not boiled for quite a while, coagulates easily in the stomach, forming lumps.

The lobbered milk if fed too liberally and alone also congeals into lumps sometimes, but these may be prevented by stirring it thoroughly, or by pouring it from one vessel to another before feeding. The safest and most profitable method which we adopted as a rule is: Mix the milk with water, about half and half, middlings or corn meal (according to the intentions of the feeder); this will do away with the formation of lumps in the stomach. If the pigs shall not be crowded for fattening, it is well to mix it with some cut clover hay. This will prevent the greedy devouring of the feed, and if they do eat a little more as is necessary to satisfy their appetite, it will not do any harm, as it is more easily digested as if fed all concentrated food.

Whoever wishes to obtain a profit from the raising of hogs for market must, in the first place, raise hogs of such breed only, and in such a way that only young animals are fattened, that are fit for butchering within eight or ten months. If the pigs have a good pasture, after they are weaned, and are kept in good condition by giving them skim milk and some mill feed in addition, a weight of 250 to 300 pounds, they will easily yield at the above mentioned age. Every experienced hog-raiser certainly knows that the feed has more effect on young, well-bred and well-kept animals than on old, scraggy ones.

It has been calculated that with young animals, before they reach the weight of 200 pounds, a weight increase of about eight to twelve pounds is obtained from one bushel of corn. Still more favorable will be the result if at the beginning of the fattening with corn, skim milk is given. This not only sweetens the short period of life to the hog, but as a reward the hog will sacrifice itself with body and soul, and yield pork of a very delicate taste and flavor. And as there exists among the wealthier classes a growing demand for a better quality of pork, and whoever has a taste at all is always perfectly willing to pay a cent more per pound above market price for such pork that has been produced under proper conditions, and put up in a nice and attractive manner.

Of course there is another class of consumers that will buy anything if it is only cheap. We all know that the reputation of a most valuable American product has been damaged by several firms manufacturing "refined lard;" and so great have been the profits of manipulating lard, that mixers have paid more for pure lard than they ask for refined lard.

In the face of all this demoralization of trade, only a short time ago some unscrupulous and flippant writer said in an article in a paper, the more cotton seed oil they put in and the less lard the people would eat, the better. Lard is not the only product that is suffering from adulteration. The Wisconsin dairymen are also suffering, not only from the substitution of ox-butter or butterine in competition with real, good cream butter, but cheese is even worse damaged by the practice of filling cheese, of which Mr. Noyes will tell a story.

Substitution seems to be law. Under the niggardly conceit for cheap things, some people can be induced to eat almost anything, if it only pleases the eye and does not offend the nose too much. If it has passed the tongue then let the stomach take care of any stuff imposed on it, and may see how to get rid of it again, is a general rule nowadays.

DISCUSSION.

Mr. Gray—How long do you keep your breeding sows?

Mr. Selle—There is no date. Sometimes two years and sometimes five years; as long as they are breeding good litters of pigs I keep them.

Mr. McKerrow—At what age do they bring the best litters?

Mr. Selle—That is different too. The average is about two or three years. After three years I don't believe it is profitable for some farmers.

Mr. Barnes—Isn't it absolutely necessary to have a quiet, good tempered sow?

Mr. Selle—Of course, that would be the best. It depends on how you keep them. Of course, unruly animals ought to go to the block.

Mr. Barnes—If a dairyman is not breeding his own hogs, will it pay him to buy hogs to feed?

Mr. Selle—If he can get them cheap enough, sure. I think it would pay him better than to put that skim milk into filled cheese. (Laughter)

Mr. Braddock—What is the skim milk worth to feed to your hogs?

Mr. Selle—That depends a great deal on what you feed with the milk. For your pigs I think it is worth *thirty to forty cents a hundred*; you can hardly do without it, I can't. If you want to get the best results under six months old, I think that is the best to give them.

Mr. Braddock—What is the best ration of grain to mix with the skim milk?

Mr. Selle—I didn't figure so close. It is pretty hard to tell what is the best ration. I feed these fine wheat middlings, wheat and rye middlings, and some corn, but it is almost impossible to give a certain rule because they don't all need the same amount; their stomachs ain't all alike. One ration will do for one hog, while for another it will be a little too much or not quite enough.

Mr. Braddock—This winter I had an offer of twenty cents a hundred for skim milk, and I wouldn't sell it, and the farmers thought I was foolish.

Mr. Selle—If I could buy skim milk for twenty cents, I would buy all I could get, if I had to raise five hundred pigs.

Mr. Cate—Did you ever feed oil meal?

Mr. Selle—Always. I have had three tons of oil meal this winter, but I feed it to cows and horses and everything. Oil meal is no natural hog feed, but you see I feed lots of clover hay and such as that, and I feed the oil meal with that so that it sticks more together.

Mr. Hill—Come to me after the meeting and I can tell you where you can move your farm and buy skim milk for ten cents a hundred, where they are making filled cheese of it now.

Mr. Burchard—How much oil meal do you feed your hogs?

Mr. Selle—Not too much. It depends a good deal on the hogs. If you feed it by itself it kind of gets stuck together, and they don't like it. The feeder has got to use his own judgment

and his hog sense. I think about half a pound is enough, sometimes you might give them a whole pound a day.

Mr. McKerrow—Not over one-fifth and possibly one-tenth of their grain ration. You fed some oil meal to that sow you showed at the state fair, didn't you?

Mr. Selle—Yes, I had some with me, and I had some clover hay.

Mr. McKerrow—Yes, I saw it shining through her skin there.

Mr. Selle—A good many of the farmers thought I was bragging, and that I didn't know how to feed that clover hay, so I took it along. I steeped the clover and mixed it with the middlings and this oil meal, and they had pretty good ration without corn. They like it.

A Lady—Is skim milk and just clear corn good for your pigs from six weeks to three months?

Mr. Selle—That is a pretty heavy ration; that is, if I am raising them for breeding purposes, I don't feed very much corn because I want to get plenty of bones and muscle on them, but if I feed them for the block then I hustle them off as quick as possible, the quicker I can get them to two hundred pounds the better.

Mr. McKerrow—Wouldn't you advise feeding about half corn meal and half middlings with a little oil meal mixed in with the skim milk?

Mr. Selle—That is the best in the world. I am feeding some ground oats now, feeding them steamed, but if you feed grain alone they swallow it whole and it will pass through the body almost undigested. Steam it till the kernels are almost burst, then mix it with the clover hay and a lot of milk, so they will have to chew. If they don't chew it they don't digest it.

Mr. Hazen—What do you consider the relative value between ground corn and wheat? We can buy wheat cheaper than we can corn now.

Mr. Selle—I pay 55 cents a bushel for wheat, and corn is 55 cents a bushel, and I would sooner take the wheat. I think it makes better flavored pork, and you get sixty pounds to the bushel, while the corn you only get fifty-five.

Mr. Hazen—I mean feeding shoats for the winter time.

Mr. Selle—I am feeding shoats from two months up. Of course, if you have no warm stable you want to feed a little corn to warm them up.

Mr. Hazen—How would you value oil meal, fed with milk and water?

Mr. Selle—They don't like that; just milk and oil meal alone, that wouldn't do. We grind our wheat and then steam it.

Mr. McKerrow—Does it pay to steam?

Mr. Selle—We are steaming every other day the clover hay, and I have got it arranged to steam six barrels at one time, and then we have a barrel of this wheat. We grind it very coarse, and sometimes we feed it dry for a change. Then we steam it, run it in pipe for about five minutes, and we cover it up and it will keep warm two days to mix with the clover hay. Not all sloppy food, that won't do.

A Member—I tried a little experiment this winter. I have got a steamer, and I had the wheat, and one pen I fed the wheat dry and after that I gave them the swill, and one pen I steamed, and I found out inside of two weeks that it didn't pay for the steaming. Those that got the grain dry did better than the others.

Mr. Selle—You see I am steaming right along, so it don't cost much fuel, and it only takes five minutes.

Mr. Cate—Can you afford to pay fifty-five cents for wheat and sell pork at the present price?

Mr. Selle—Well, yes. It ain't very inviting now, but I have to feed them something anyhow; they have to live. Sometimes you lose a little, but then you want to raise hogs when they are cheap, and you have something for sale when they are high.

Question—How many pounds of pork do you expect to get out of a bushel of wheat at fifty-five cents?

Mr. Selle—I experimented two years ago, and I made the wheat pay me eighty-five cents.

Mr. McKerrow—I was going to suggest,—Mr. Selle says that he believes in a variety of food. You wouldn't feed wheat alone anyway, would you?

Mr. Selle—Oh, you are behind if you feed wheat alone.

Mr. McKerrow—P. D. Armour, Jr., has been making some

tests in feeding wheat to hogs on his Oconomowoc farm, which shows when he sold his pork that he got ninety-five cents for the wheat. Down at the station they are now carrying three lots of hogs, feeding one lot on corn meal alone, one on wheat alone, and one on the mixture. I forget the figures, but I know that the mixture is beating either one of the others by considerable.

Mr. Selle—The mixture is best, of course. Of course, if you come to fattening, you want to leave away the clover for the last few weeks and feed corn. For breeding or growing stock we want to have bone and muscle first and then fill them up with fat.

Mr. McKerrow—Wouldn't you prefer good silage instead of clover?

Mr. Selle—I only had my silo filled once. They will eat it just to fool away time, but then clover is better.

Mr. McKerrow—My hogs will clean up the silo. I have got a brood sow that eats fifteen pounds of silage a day.

Mr. Selle—Yes, I believe it, but as a rule corn silage is no general hog feed. For a change sure enough they like it, and they eat something else which is worse than silage.

A Member—Is whey worth anything to feed the hogs?

Mr. Selle—I don't live near a cheese factory and I never fed any whey, but a friend of mine can get all the whey he wants, and he took home a few cans and poured it right into the trough, and one old sow came there and cleaned out the whole trough. Then she went to the creek and drank some water and the next thing he knew the sow was dead. That is all I know about it.

Mr. Noyes—Whey is worth from ten to fifteen cents a hundred to feed, if properly cared for, when skim milk is worth from twenty to twenty-five cents a hundred. It is worth, when sweet, half as much as sweet skim milk; of course, it must be mixed with other feed.

A Member—Would you favor a hog sleeping in as warm a place as the basement of a barn?

Mr. Selle—I couldn't give you any information because I have no basement. My barns are all above ground. If it isn't too damp and is ventilated it is all right, but where you

have stone around them, they are always inclined to be damp, and damp air is no good place for a hog to sleep. I built a new hog barn one year and it was a little too warm. I boarded it and tar-papered it and put six windows on the south side. It was so warm it was unhealthy and I had to make two ventilators in it.

Question—When you say skim milk is worth forty cents a hundred, do you mean separator milk?

Mr. Selle—No, it is from deep setting.

Mr. Grengo—How about mixed bran and milk?

Mr. Selle—It is a good drink and a good feed. You have to fix it up the way they like it best.

Mr. Millard—I have fed a hog to experiment with nothing but whey, and sour whey at that. It was a sow that I got from the butcher that had just weaned her pigs, and in forty-two days she gained sixty pounds, and she had nothing but the whey.

Mr. McKerrow—If that test had been continued a while longer you would not have had those gains.

Mr. Phillips—This gentleman must have got his whey from a poor cheese maker, that run the majority of the solids in the whey.

Mr. Noyes—The majority of the cheesemakers in this state don't make that kind of whey.

CHEESEMAKERS' SESSION.

HINTS TO CHEESEMAKERS AND PATRONS.

E. L. Aderhold, Neenah, Wis.

When a cheesemaker takes charge of a factory in the spring, his aim should be to make a first class article, if possible, every day during the entire season.

Now, that means a great deal. Rain or shine, Sunday or week-day, your vigilance is constantly required lest some undesired change takes place in the process of manufacture that might have been prevented by close watching.

In order to be a No. 1 maker you must be somewhat familiar with the laws of nature that govern the work at the different stages, beginning with the nourishment of the cow and ending probably months after the cheese have left the factory. You will need to be progressive also, for, although you may have done a good job in the past, if you don't know considerably more about the profession next spring than you knew last spring, you will be behind the times.

There is one feature in the business that makers don't give sufficient attention, and that is to work for uniform color, and uniform curing qualities in the cheese of the different factories, especially when they make cheddars. The cheddars that gave best satisfaction last season were slow-curing and either high-colored or white. Your hot curing-rooms make the cheddars cry for more salt so that flavor will be preserved and the cheese will be less porous. Cheddars made during hot weather from good curd should be salted at the rate of 2 3-4 to 3 pounds of salt per 1,000 pounds of milk.

It is not always necessary to visit different factories in order to find cheese of different curing qualities. Frequently there is a wide difference in the curing qualities of the different days' make at the same factory. This can be avoided by using a little common sense. If your curd is too dry when you draw the whey, pile it higher and begin piling sooner; get it good and meaty before grinding and use less salt. If curd is too moist don't pile so high and use more salt than usual.

It is generally understood that the amount of rennet affects the curing qualities. I think 1-4 of a pound of salt affects the curing qualities more than an ounce of rennet does.

The practice of capping cheese with light circles during hot weather promises to become quite general. I have noticed that as a rule the circles used have been too large. Where the circle overlaps the bandage it does not adhere very well and it gives the cheese a ragged appearance. It is better to err on the small side, and if the circle does not quite meet the

bandage, grease may be applied when the cheese is first put in the curing-room. Where a "14 1-2 hoop is used the diameter of the circle should be from 11 to 11 1-2." If for any reason the circle does not adhere perfectly, or if it becomes loose in spots during the process of curing, or if the cheese is not perfectly closed in under it, it should be removed entirely and grease substituted.

Many makers ought to be more particular about little things. In many factories the press-rings on the followers do not project outward far enough; the curd is squeezed up and the result is a narrow rim sticking up on the edge of the cheese.

If a maker lacks the good taste to make a square-shaped, neat appearing cheese he has missed his calling

Prompted by the losses you sustained during last season you have finally concluded to call a halt to the time-worn and fallacious custom of guaranteeing to the patrons a first-class cheese. Many of you have struggled on under heavy losses that were impossible to avoid, and when you reached down in your pockets and made good the loss the patrons probably tried to console you with "why did you accept milk that wasn't good?" I don't know as you were entitled to a more substantial consolation, as you have no one to blame but yourselves for being in such a deplorable situation. You have never stood up for your rights, and you have had to suffer the consequences.

To the patrons I have little to say except that you are not sufficiently progressive, nor you don't seem to realize the value of a good maker; 75 per cent. of you lack the push to read a dairy paper and 75 per cent. of the patrons throughout Wisconsin never have their dairy utensils so clean but what filth may be seen with the naked eye, in the seams and corners, which they have neglected to have properly soldered.

During the past season makers were forcibly reminded of the fact that they could not live and guarantee cheese at the same time, and probably the coming season will see a change in cheese factory management. The maker will be responsible for his work only, and the patron will be responsible for the quality of milk he furnishes. That will put the business on a proper footing and good results will be evident. Milk

will be better taken care of and there will be a greater demand for good makers.

I have a great deal of sympathy for the progressive patron who is obliged to patronize a factory that is managed by a slovenly maker. Patrons should pull together and encourage their makers to be vigilant and progressive. You should not ask your maker to do $100 worth of work for $50. I don't mean to say that makers' wages should be raised all around, because some maker's services are not worth much. On the other hand, a maker who operates a factory that has only the average run of milk, if he does strictly first-class work, does not receive proper compensation for his services at 1 1-4 cents per pound.

I know some No. 1 makers who operate factories owned by them, who could make twice the money if they would let their factories stand idle, and work out.

When the success and reputation of a factory will depend on the maker's skill, instead of his pocketbook, then you will know how to appreciate a good maker's services.

DISCUSSION.

Mr. Phillips—Mr. Aderhold, what time in the season would you advise the cheese makers to use two and three quarters and three pounds of salt?

Mr. Aderhold—I would advise him to begin as soon as the cheese are apt to see hot weather in the curing rooms.

Mr. Phillips—Somewhere about the first of June or the 20th of May.

Mr. Aderhold—The first of June, I think, should be soon enough, because the May cheese are generally shipped out and demanded sooner than the June cheese.

Mr. Phillips—How much salt did you use in the fall of the year when you were getting the cheese through, cheese for home use?

Mr. Aderhold—About two and a quarter pounds of salt in a home-use cheese. I don't think that makes as good a cheese as it would to use more salt, but the great cry is for a meaty cheese, and a cheese that is made in the fall is never warmed up, it is kept at a low temperature in the factory, and after it is shipped out of the factory, and it is supposed to be consumed before spring.

The Chairman—Do you use more salt in four per cent. milk than you do in three and a half per cent. milk?

Mr. Aderhold—Certainly. There ought to be more salt used if you were making up cheese from that kind of milk at the same time, but you don't. There isn't any factory that tests .5 per cent. more than another at the same time.

The Chairman—I noticed two or three weeks ago in attendance at a dairy convention in Western Ontario, you know that Canada is in possession of a splendid reputation and she has some very expert cheesemakers and I was very much struck with the discussions on this subject over in Canada. They discussed every single point of it, pro and con. They were very eager and very determined to get at the pith and to raise the standard still higher. I remember especially hearing one of their cheese instructors advising cheesemakers to use more salt in four per cent. than in five per cent. milk, and they gave their reasons.

Mr. De Land—Have you ever made cheese without any salt, and noted the results, compared that cheese with others which you salted at the same time?

Mr. Aderhold—No, I never did.

Mr. Noyes—At the Experiment Station at Madison we made cheese that way. I have forgotten the proportions of salt we used, but we used different proportions up to no salt, and the cheese that had no salt were very porous and open, and the pores were full of gas. It was very sweet, nothing to preserve it. You couldn't place any value on that cheese.

Mr. De Land—Does salt preserve in the sense that it preserves meat, or isn't it principally that it gives flavor?

Mr. Noyes—It certainly does give flavor, and it seems to me it helps the making of the cheese in breaking it down in some way.

Mr. Aderhold—Don't you think the cheese will take flavor quicker when it is not salted at all than when it is salted?

Mr. Noyes—All that I ever saw had a bad flavor.

Mr. De Land—I think often we get our minds made up to a point and our experiments are all made to more thoroughly impress that we are right than to get at the real truth. I have pressed a portion of the curd without salting and salted the other part two and a half pounds to the thousand. I kept them and bored those cheese and had others see what they thought as to how the salt affected the cheese. Well, the flavor of both was nearly the same. There was a different flavor to the unsalted cheese, but the texture was the same in the experiment that I made. I believe that it is simply a flavor and not a preservative, the salt. I do not think that the salt has such an important effect in preserving cheese .

Mr. Noyes—I cannot fully agree with the gentleman, because all the butter that I have made without salt never would keep as well, and it has worked the same way with cheese, and the texture was not as good. We made quite a few experiments, and it seems to me that salt has a preservative quality in both butter and cheese.

A Member—How should the milk be handled before it is taken to the factory?

Mr. Aderhold—The milk should be well aired immediately after being drawn from the cow, and it should not be put into the average milk pail or milk can, because they are not fit to put milk in. They are made so that they cannot be kept clean.

Mr. Noyes—Where should that milk be aired? Should you air it by the barn or the hog pen, and how do you want it aired?

Mr. Aderhold—I want it aired in a place where the air is pure, and it doesn't make so much difference in what manner it is aired so that it is well exposed and aired soon after milking. With the aerator the milk is strained into it right from the cow, and it takes care of itself, and that is the best time to air it. If they do it by hand with the dipper, they generally wait until they get ready, the milk has to wait for some time, and the aeration does not have as good an effect as it would sooner.

Mr. Burchard—I would like to ask what aeration does.

Mr. Aderhold—It purifies it.

Mr Burchard—How is that demonstrated and how are you going to purify pure milk?

Mr. Aderhold—I don't know any other name for it. I know it makes the milk purer than it was when it came from the cow.

Prof. Russell—It takes out the animal heat.

Mr. Aderhold—Not only that, but I don't know what the other changes are. I do know that we can handle that milk to better advantage with smaller loss, we can make more cheese and finer cheese.

Prof. Russell—That seems to be demonstrated, and still some of us would like to know the reason why, and I did not know but that possibly there might be some explanation from the cheesemakers' standpoint.

Mr. Aderhold—Perhaps it is caused by the injection of oxygen. That milk that has been treated in that way will not take on bad odors as readily as it would if it had not been treated to that extent. It is better keeping also. Milk that is properly aerated will keep for hours longer at the same temperature than if it had not been.

Prof. Russell—Have you ever experimented on that particular point?

Mr. Aderhold—Yes, I have had my patrons and a good many of them are right here now. I have had them keep their milk out of water. I was the first one in this section of the country that had them do it—the first one that had them try those aerators, and I made them keep it out of the water, except on an unusually hot night, and the result was good. They were all afraid to do it, but I compelled them to do it. I had one patron that said he was going to keep his milk out of water, no matter how hot it was, and his milk never got sour, never got too ripe.

The Chairman—Your idea was that that cooling down of the milk locked up this bad odor in it?

Mr. Aderhold—It is not necessary to cool it down if it will remain sweet without cooling.

The Chairman—Do you think by cooling down the milk that

it would be possible afterwards to liberate this element that you try to liberate by aerating?

Mr. Aderhold—No sir, not until it is warmed up.

Mr. Phillips—I believe that I have had as pure milk to manufacture into cheese as any cheesemaker in the state. I speak of the milk from three herds in this state. In the first place we couldn't get that milk in the right condition to realize the best results from it until we got the milk aerators and aerated that milk. After the third day there was no milk that came into the dairy building to be manufactured into cheese without its being aerated, and from that time on we had good success in keeping the milk in a condition to manufacture into cheese.

Mr. Aderhold—I want to say a word about the practice of aerating milk and not cooling. You will have less trouble if you try that, if you keep your milk in an average milk pan, or use the average milk pail, the way they are generally made and sold. You have got to have the seams and corners soldered smooth, so that when they are washed with a rag, every portion of the can is touched, and there is no place for any filth to gather. If there is any filth it starts that milk to souring, and if it is not cooled down, it is at a temperature where it will sour very rapidly during the summer.

The Chairman—Is it best to wash milk cans with a rag or a brush?

Mr. Aderhold—I don't know. Steam, of course, is a good way to clean them.

The Chairman—I noticed recently that in Canada they are very much opposed to carrying the whey home from the factories in the milk cans. What do you think about that?

Mr Aderhold—I have never handled a factory, but what they were using their cans in that way.

Mr. Noyes—Where the whey is properly handled there isn't any great danger in the man's taking it home in the can, but the can should be perfectly clean and the whey should be sweet, so that it would not cut the tin.

THE VALUE OF WHEY AND HOW TO HANDLE IT AT THE FACTORY AND FARM.

H. J. Noyes, Richland City, Wis.

The value of whey depends upon how the milk is cared for before it reaches the factory. In order to have good whey the milk must have proper care at the farm, must have healthy cows, healthy food and healthy surroundings. Lack of cleanliness is the great bugbear which factorymen have to contend with. Too many barns are not properly ventilated or cleaned; far too many milkers go to the stable to milk without ever thinking of washing their hands or brushing the cows; most any water is good enough for the cows to drink; they seem to enjoy standing in slimy, stagnant pools of water, therefore it must be good for them. So also do many men enjoy standing about a bar in a foul smelling saloon. Cows can be corrupted as well as men though not to such an extent.

After the milk has been curded and cooked for a half hour, the whey should be drawn into the whey vat, with the exception of enough to cover the curd, and as soon as it is in the whey vat it should be heated to one hundred and fifty degrees. When the curd has matured sufficiently, draw the remaining whey and heat again to one hundred and fifty degrees. This will kill the bacteria, and the whey will keep sweet much longer with this treatment. When whey is allowed to become too sour, gets beyond lactic acid and verges on acetic acid, it is a positive injury and should not under any circumstances be fed to stock. If it were practical it would be better to remove the whey which drains from the curd after it is on the racks and in the press, to a separate tank, and mix with the sweet whey at the time of feeding, and fed to older stock. This whey is richer but contains more acid which very young stock should not have.

We cannot make good whey from milk that comes to the factory half sour, or tainted, or diseased, as the whey from sour milk will get very sour, and from tainted milk it will be ropy or stringy. I have seen the curd float fifteen min-

utes after it was heated and the whey would foam and look green and smell bad. The next morning it would be ropy and unfit for use.

The composition of whey according to the New York experiment station is as follows: Water, 93.02; fat, 0.42; casein and albumen, .82; sugar and ash, 5.74.

Whey ought not to be heated too hot. If it is it will coagulate the albumen and it will separate from the whey like any curd and go to the bottom. Whey vats should not be sunk into the ground, and should have a house or roof over them, at least to exclude rain, and to shade it from the hot sun, thus causing it to sour. I like the plan of having the whey tank elevated high enough so patrons can drive up close to them and draw the whey direct into their cans. The whey can be drawn from the cheese vat up into the tank with a jet pump. In this way it will be partly heated when it reaches the tank. If I had spring water running into my factory I would put a coil of pipe in the whey vat and run cold water through it to cool the whey after it had been heated. Whey treated in this way will keep sweet at least one day longer than in the ordinary way.

The whey vat must be thoroughly cleansed each day by the use of a scrubbing broom and boiling water. The surroundings of the tank may be kept sweet by the use of some disinfectant; chloride of lime is good to sprinkle around it once a week.

As soon as the whey arrives at the farm it should be emptied into a clean barrel, which has a cover. It should be kept in the shade or a cool place. The barrel should be emptied every day and washed and scalded. Whey should be fed three times a day to obtain the best results and not too much at a time. It requires more care to feed it to young calves and pigs than it does to older stock. If whey is handled right at the factory and farm it is worth twelve to fifteen cents per hundred, or half the amount of skim milk treated in the same manner. I have seen fine calves raised on whey, oil meal and oats. The oil meal was made into porridge, one tablespoonful of oil meal put into one pint of boiling water and then mixed with whey. This is for a calf three to four weeks old,

oats fed dry, the oil meal fed twice a day and increased as the calf grows older, being careful not to feed enough to get the bowels out of order. I once fed a calf on whey with fine results. Began when the calf was about a month old, fed three times per day on clear, sweet whey. This with good pasture was all it had. It became a very fine large calf, and was a credit to the whey tank.

I have fed pigs on sweet whey mixed with shorts, that thrived well, and by adding corn to the ration the last two months they weighed two hundred fifty pounds dressed when eight months old.

I am glad there is more attention paid to the by-products of the factory and creamery in keeping them sweet and clean, so the farmers can get all the feeding value there is in them if they will handle them right after they arrive at the farm. I have heard men declare that whey was not worth anything, and at the same time drive around to the vat and take twice or three times as much as belonged to them, and look sad because their cans would not hold more. They would take it home, put it in an old sour swill barrel standing out in the hot sun, it would get so hot that it would foam and raise and run over in its haste to get to the hogs. The farmer would feed it once a day all the hogs could drink; it would make them so fat that it would take five yearling shoats side by side to cast a shadow as they leaned against the fence. Then the farmer would swear that whey was no good, and it did not pay to raise hogs.

DISCUSSION.

A Member—Do you keep your tanks covered so that the flies can't work around them?

Mr. Noyes—No, the whey should have some air till it is cool. Then you can cover it as tight as you wish.

Mr. McKerrow—At what age would you put a calf on whey?

Mr. Noyes—I would take a calf three weeks old, and feed him to start on, about a quart each time, add a little sweet milk and then I would work off the sweet milk at about three

months old, put them on a ration of oil meal and sweet whey, three times a day. This would be the old process linseed oil meal. I would cook the meal for a few minutes.

Mr. Burchard—I think flaxseed meal is decidedly better.

Mr. Aderhold—You spoke about raising the whey into the vat with a jet pump. How would you use that jet pump if you were using a self-heating vat?

Mr. Noyes—I don't believe in using self-heating vats anyway. In my opinion, if a factory can't get milk enough to put in a boiler, it doesn't pay to run such a factory. Our factories should be larger and give us plenty of good steam.

A Member—What are they paying you for making cheese?

Mr. Noyes—A cent and a half a pound.

A Member—Do you guarantee your cheese?

Mr. Noyes—No sir, there is none guaranteed in our section.

The Member—You would get none of my milk if you didn't guarantee it.

Mr. Noyes—We don't need it.

Mr. Aderhold—When a patron has neglected his milk, he is better aware of that fact than the cheesemaker is. If a man will tell me where he can get a maker that will tell the difference between good milk and milk that will make a good cheese and poor, I know where he can get four thousand dollars for six months' work.

Mr. Noyes—A good deal of milk that passes the weigh-can is in a condition which cannot be detected until it is heated up. You take milk that has been aerated and sometimes it has not, the cheesemaker cannot detect that, until it is heated up to 120 degrees, and then it will throw off its bad flavor. I don't ask any of the cheesemakers that I have, to guarantee their cheese, and I would say that we have as few rejections in our section as anywhere in the state. The fact of the case is, it gives buyers a great chance to literally clean out the cheesemaker, and he don't get anything for his summer's work, and like enough, comes out four or five hundred dollars in debt. A great many buyers will go onto the Board of Trade and crowd those cheese up to the highest notch, they will pay too much for them, and then go out to the factories and inspect the cheese and reject it, and the cheesemaker has got to stand be-

hind it. Gentlemen, it is not a fair deal, and I think the best patrons we have in Wisconsin will stand by their cheesemakers. There should be the highest confidence between the cheesemaker and his patron and they should work together, when they get a good article stand behind the cheesemaker. Is it right for a good, first-class cheesemaker to work the whole season through and come out four or five hundred dollars in debt, and then the patrons sit down on him and keep quashing him down. That cheesmaker is a conscientious man. He has taken in milk he thought it was his duty to take in, he is making a good article of cheese and he has done his work all summer for nothing, and we do have buyers that don't do the square thing sometimes. You take a lot of cheese and that man rejects them, or comes around again and buys them for almost nothing, and it isn't right that the cheesemaker should stand the loss.

The Chairman—Wouldn't it be a good idea for the cheesemaker to guarantee his product if the patrons will put themselves under bonds to furnish good milk?

Mr. Noyes—Yes, that would do.

Mr. Aderhold—In my factory the guarantee system was discarded three years ago, and I haven't had a patron ask me to guarantee since then. It works all right. I guarantee to do good work, and I get better milk by not guaranteeing the cheese.

A Member—Last summer I had a patron who takes as good care of his milk as can be. He set it on the south side of his house, on a grass spot; there was nothing nasty around, except on the other side of the fence there was a barley field, and he cut his barley and I had trouble one day with the milk, and I found it was his milk. I went to his place to find out what was the trouble and could find nothing, but he told me that in the morning he noticed little spots of bright yellow on top of the cream. I asked him to move his can on the other side of the house and he did so, and it was all right. Now, wasn't there some germ in that barley that affected that cream?

Mr. Noyes—I never had any such experience, but I presume it occurred.

Mr. Strowler—Is not a good deal of the trouble in making

cheese right in the factory? I have seen a good many factories that are just as filthy as can be.

Mr. Noyes—Yes, of course, the factory should be clean and nice. I remember one time in the creamery we had trouble with our cream and our butter was off, and we couldn't tell where it was, and we hunted around and couldn't find it. Finally we made some experiments and we saw that it came from a waste water tube that was in the factory. Factories should be kept clean and scalded thoroughly with boiling hot water, and use some lye around your ditches and your separator and all greasy places.

A Member—How many thousand pounds a day would be required to be able to use steam in a factory to make it pay?

Mr. Aderhold—When they are paying a cent and a quarter a pound they ought to get close to eight thousand pounds a day.

Mr. Noyes—Oh, put it six thousand.

A Member—How much should a good cheesemaker earn a day after paying all expenses?

Mr. Aderhold—I don't believe it ought to be by the day. He ought at least to be able to make from four to five hundred dollars a year. Lots of them are getting more than that and they are earning it too.

A Member—If you had eight thousand pounds a day, would you not have more than that?

Mr. Aderhold—When a man works up eight thousand pounds of milk, isn't he earning more than when he makes up three thousand?

A Lady—I saw something that spoiled cheese for my eating and a good many others besides, and that was the perspiration from the cheesemaker's face and neck dripping right into the tank.

Mr. Noyes—Gentlemen, this is a good point. I tell you cheese wants to be looked after. The best cheesemakers in our community today have a cloth pinned to their coats, with which they wipe off their faces.

Mr. Phillips—I don't think that there is any need of a cloth or for the cheesemaker to have any such warm time over his cheese if the patrons would take the proper care of the milk,

and the factorymen would keep the factories neat and clean. The milk would come to the factory in such condition that they wouldn't have to hurry themselves so hard that they are going to drip in that way. What makes the cheesemaker sweat is when he gets lots of poor milk in the factory that if it is not attended to at once, he is going to lose his whole batch of cheese.

Mr. Strowler—The cheesemakers and the patrons must work together to get good cheese.

Mr. Phillips—That is very true, and it is something that they are not doing in this section of the country, and you might say, pretty near all over the state. I notice that the farmer wants his milk made up cheaper, always trying to get it made up cheaper, while, of course, the factoryman wants to be paid for his work. If the patrons would work with the cheesemaker to build up the factories so they will get more milk, and not, on the contrary, build up little factories, perhaps right next door to him and cut him off, things would go better. A man can't make up a small amount of milk and poor milk at that at the same rate that he can afford to work up eight or ten or fifteen thousand pounds, and it costs to run the factory pretty nearly as much.

Mr. Noyes—Then, too, where a factory has more milk they can afford to build a better building and their product can be kept in better shape. In many cases where they put up these small factories they put one thickness of board between the cheese and the weather, and in the summer time you will see the thermometer standing from 85 to 95 in that place and the grease frying out of the cheese, and no matter how good your cheese are, when they are first made they can't go through such weather as that and come out first class. If you have the right kind of a building, with better facilities for making, your buyers also will give better prices, because the cheese is not only better, but there is a larger line of it, and they like that.

A petition addressed to the legislature asking support for the senate bill controlling the sale of adulterations of butter and cheese, was presented to the convention, and members asked to sign it, which they did in very large numbers.

APPOINTMENT OF COMMITTEES.

On Nominations—A. D. DeLand, T. J. Van Matre, M. T. Allen.

On Resolutions—G. W. Burchard, N. Simons, H. C. Adams.

On Dairy Implements—Chester Hazen, H. C. Taylor, H. J. Noyes.

On Dairy Products—A. D. DeLand, W. C. Dickson, S. R. Crosby.

Convention adjourned to meet at 2 p. m.

Convention met at 2 p. m. same day.

The president in the chair.

THE MAKING OF FANCY BRANDS OF CHEESE.

T. L. Haecker, Professor Dairy Husbandry, Experiment Station, St. Anthony Park, Minn.

It may seem presumptuous for me to discuss the making of some fancy brands of cheese, but my desire to meet so many familiar faces and the hope that I might possibly submit some points which would warrant the time occupied caused me to accept the invitation.

The making of fancy cheese was suggested by seeing so many cheese of foreign make in our markets. It is not an unusual thing to see as high as twenty varieties of cheese on sale in some of our leading groceries. They generally sell for figures which would seem to warrant a few factories in each state being equipped with the apparatus necessary for their manufacture. Especially is this the case with the varieties known as Gouda, Edam and Emmenthaler, which require but few appliances not kept in ordinary cheese factories. The chief obstacle in the way of their manufacture is clean milk fresh from the cow and the want of a press furnishing a continuous pressure. The latter difficulty is now fortunately overcome by improvements in our gang presses, and I believe

that the continuous press will come into general use even in our common factories in manufacturing cheese by the cheddar process.

The other difficulty is one not so easily overcome. Patrons are slow to learn how necessary it is to use only milk from cows in perfect health, to keep barns and stables clean and the air pure by proper ventilation. The milk from a single cow off her feed, in season, or anything that will cause an abnormal condition of the system will taint all the milk and spoil the day's make. Cows must not be fed with sour or musty ensilage, nor with musty grain or hay, but all feed must be sweet and wholesome. The utensils must be kept scrupulously clean and thoroughly scalded and aired after each milking. In order to secure best results the milking must be done with the greatest care. The cows must be kept clean and bedded with fresh, clean bedding, which should be changed daily so as to keep the stall free from must. The udder should be brushed clean before the pail is placed under the cow, milked with dry hands and strained through three or four thicknesses of cloth circles fastened on the under side of the strainer. This will free the milk from all foreign particles, and by straining the milk into narrow necked cans and removing them from the stable as soon as filled, will secure minimum exposure.

Nearly all the favorite brands of cheese originated in countries or localities where there is considerable moisture in the air. This is especially the case with Gouda and Edam, which originated in Holland. Indeed, the cheese industry always seems to meet with most satisfactory results near large bodies of water. It would therefore seem that a moist atmosphere is especially favorable to cheese making. Holland, France and England are favored in this respect. In this country the cheese industry thrives best near our chain of great lakes. New York, Canadian and Wisconsin cheddars are noted for their fine flavor, texture and keeping qualities. In this state all that section bordering on Lake Michigan, Lake Superior and Green Bay seems peculiarly adapted for this industry. I believe Michigan also to be adapted for cheese, but so far her opportunities have not been improved because the making of

soft soaked whey cheese is persisted in and they are not wanted by dealers for obvious reasons.

Passing farther west, across the Mississippi, into sections where the atmosphere has less moisture, conditions are more unfavorable. Processes for one section will not answer for localities under different conditions.

In our first dairy school work we followed the process described by the best foreign authorities and found the cheese was too hard and contained too little moisture. With us the formulas must be changed somewhat to adapt the cheese to the climatic conditions and the prevailing taste of consumers in this country. Strange as it may seem, the sweet curd cheese for this country should not be salted as much as is required for foreign markets. Our people prefer a softer and milder cheese. The Emmenthaler, Edam and Gouda made at our school had also too much salt.

EDAM CHEESE.

I have experienced considerable difficulty in securing just the right kind of molds for this cheese. Last winter we used wooden press and salting molds, but soon found that they were not desirable, did not give the cheese the proper form, were too small and checked badly. During the summer I purchased an imported Edam weighing four pounds, being of standard weight, was spherical but a little flattened at each end. We took the cheese to a foundry and had a mold patterned after it, allowing for shrinkage in curing we increased the mold a half inch in diameter and we now have one satisfactory both in size and form.

METHOD OF MANUFACTURING EDAM CHEESE.

It is not an easy task to describe accurately the method of manufacture, as there is such a great variation in different milks and the process must be changed to adapt it for the different seasons of the year and the difference in curing rooms. For this reason it requires a skilled cheesemaker to produce uniformly a good article.

Foreign Edam is generally made from mixed milk. The evening's milk is set and skimmed in the morning, warmed to

86 F. and mixed with the fresh morning's milk, the mixed milk testing about 3 per cent. fat and the cheese analyzing about 24 per cent. fat. The milk should be set at 86 F., though in winter a higher temperature may be desirable when whole milk is used. Use at the rate of about one and a quarter ounces of color for a thousand pounds of milk. It never pays to bother with home made or inferior rennet. It is not possible to state the exact amount of rennet that should be used as it varies in strength, but enough should be taken so the milk will commence to coagulate in five to seven minutes and should be ready for the knife in from fifteen to twenty minutes. We used from eight to ten ounces per thousand pounds of milk. Dilute the rennet with about five times its volume of tepid water, and in pouring it into the milk pass over the whole length of the vat so that the rennet will not all be put in one end. Stir the milk with a large inverted dipper by moving it slowly through the milk the whole length of the vat so as not to give the milk a tide motion. Stir about one and one-half to two minutes, then set the dipper on the surface of the milk a moment to check the agitation, cover the vat until the curd is ready to cut. To ascertain this insert the index finger into the milk at an angle of 45 degrees, with the thumb slightly break the curd laying over it, gently raise the finger and if the curd breaks clean, leaving but few or no flakes, it is ready to cut. A little practice will soon teach one when the curd cuts to best advantage. It should not be so firm that it will cut hard, neither should it be cut when it is too soft, as this occasions great loss of solids in the whey, yet the general tendency of the curd should be towards softness. The American curd knife is recommended as its use occasions less loss of fat and other solids. First cut with the horizontal knife lengthwise with the vat, then follow with the vertical knife as soon as the whey begins to appear between the layers of curd. Cut lengthwise of the vat with the vertical knife, then cut crosswise until the curd is cut into pieces the size of wheat kernels. The curd should be cut with great care as rough and quick handling breaks off many of the corners of the little delicate cubes, giving the whey a whitish appearance, which means heavy loss in casein and fat. The whey should have an olive

shade. Other things being equal, the finer the cutting the sooner will the curd be ready for the mold and the dryer and firmer the cheese. If the cheese is to be kept in a curing room, comparatively dry, coarser cutting is advisable. After cutting, the curd is allowed to settle and firm a little. Then stir gently for five minutes and apply heat, gradually raising the temperature to 98 degrees, though sometimes when the curd has not been cut uniformly it is necessary to raise the temperature from two to six degrees higher. I would resort to this method in preference to holding at a lower temperature and occupying more time before the curd is put into the mold. The curd is sufficiently cooked when it is firm and elastic, and when the larger particles of curd are not soft and watery inside. It is difficult to give a full description of all the conditions bearing upon this part of the work; there should, however, be no unnecessary delay in getting the curd under pressure as the ripening process at this stage of the work is very rapid. When the curd is sufficiently firm it is allowed to settle, when the whey is drawn off until the upper surface of the curd begins to appear.

FILLING THE EDAM MOLDS.

Before the molds are filled they should be put in warm water so the curd will not be cooled during the process of filling. This will promote the formation of a good rind. As soon as the whey is drawn fill the molds at once by taking a double handful of curd and pressing gently but firmly into it; as the filling progresses pour out the whey. Care should be taken to put the same quantity into each mold to make the cheese perfectly spherical and of uniform size when pressed. When they are filled, put under gentle continued pressure for a sufficient length of time to make the cheese firm enough to retain its form while it is being dressed, which may require from fifteen to sixty minutes, according to condition of curd. When they are ready to dress set the molds containing the cheese into a vat of sweet whey or water at a temperature between 120 and 130 degrees Fahrenheit. Let stand for a minute before removing from the mold. Then take the cheese out, place it in the warm water for one or two minutes, then wrap

a linen cloth around it, folding the edges carefully over on each side forming small plaits at regular intervals; put a linen cap on each end, replace and put under pressure. The cloths and caps must be thoroughly soaked in the warm whey or water before applying to the cheese, and care should be exercised that no part of the cheese remains uncovered and that in returning it to the mold the bandage does not get displaced. If from any cause the curd seems to be tainted, washing in water at a temperature of 100 degrees before putting it into the mold, will assist in freeing it from taint. Edam cheese does not require as much pressure as cheddar; 60 to 120 pounds under ordinary conditions will be sufficient. They should remain under pressure from six to twelve hours, though no harm will be done if they are not taken out until the day following.

SALTING AND CURING.

When the cheese is taken from the press the molds are set in water at a temperature of 120 degrees and allowed to stand for a few minutes. The cheese is then taken out and the bandage carefully removed, using care not to tear off any of the rind. The cheese is now ready for salting and for this two methods may be employed, dry or wet salting. In dry it is necessary to have six salting molds to every press mold; these are made of wood, are quite similar in form to the press molds, but require no cover. The inner surface of the salting mold is completely covered with a coating of salt; the cheese is then placed in the mold with a little sprinkling of salt on the upper part exposed to the air. This is repeated for five or six days, turning them each day so they will settle into the proper shape.

If iron molds are used wet salting will be preferable; the cheese will have the proper form when taken out of the press, thus requiring less labor. In wet salting the cheese is placed in a tank of brine as strong as it can be made, a little salt is sprinkled on the upper end exposed to the air. The cheese should be turned each day and left in the brine four to seven days. The temperature of the brine may range from 60 to 70 degrees. Surface salting makes it exceedingly difficult to

obtain uniformity; some days' make will take salt more readily than others, owing to the variation in the percentage of moisture in the curd. It is therefore especially important that the milk worked is fresh and that the cutting be as uniform as possible. When the cheese is sufficiently salted it is taken out of the brine and placed on a board to drain for twenty-four hours. It is then washed in warm water, wiped dry and placed on the shelf for curing, leaving a little space between them. Always set the cheese on the flattened end, turn and rub with the hand each day the first month, twice a week the second month and once a week the third month. The curing room should be cool and moist, the temperature should be held between 55 and 65 degrees, and there should be no sudden changes even within the temperatures given. Fresh air is also of prime importance, though strong currents should not be allowed to come in contact with the cheese as it will cause cracking. If the air in a curing room becomes foul the cheese will become slimy or pasty and injurious fungi will soon develop. If the room is too damp bluish-yellow or red spots will appear which injure the quality of the goods and in extreme cases render it worthless. The injurious effects of a sudden change to a low temperature was clearly shown last spring. The curing room in our dairy hall is in the basement. During the day, if the weather was mild, a window was generally left open for ventilation. One afternoon while the attendant was away a storm suddenly arose and before his return the temperature in the curing room fell some twenty degrees, causing some of the cheese to open. During the fall we made some changes in our curing rooms, which are proving very satisfactory. The rooms are in the northwest corner of the basement, each one being provided with a steam coil extending along the north side of the room, another perforated steam pipe runs along the cement floor next to the wall. The temperature of the room is controlled by the steam coils and the moisture by the perforated pipe. By this simple contrivance we find no difficulty in holding both the moisture and temperature within the desired limits. At no time during the three weeks of severe weather has the temperature fallen below 55 nor gone above 65 degrees, and the moisture below 85

nor above 95 per cent. of total saturation. We are also curing our cheddar cheese in these rooms.

PREPARING EDAM CHEESE FOR MARKET.

When the cheese is two or three months old it is prepared for market by turning it in a lathe until it is smooth and round, then colored with analine. The dye is made by dissolving a little analine or carmine in alcohol or ammonia. Take a two or three gallon jar, fill two-thirds full of water and add enough of the coloring matter to secure the desired shade. In this bath put the cheese for a minute or two, then place on the shelf to dry, and when dry give a little coating of boiled linseed oil. When in the coloring bath the cheese can be conveniently graded; the solid cheese will drop to the bottom; these are good keepers and belong to the best grade. Those more open and of poorer quality will barely sink, while the ones that float are inferior goods. Cheese for export are wrapped with tinfoil in much the same way as in dressing; they are placed in boxes, each containing twelve cheese, in two layers of six each, the cheese being partitioned off with narrow boards.

I append herewith a tabulated statement giving the processes by which the different makes were manufactured, as it may assist some in their work:

"A"—Processes and Principal Conditions in the Manufacture of Edam Chesse.

Date.	Lbs. of milk in vat.	Per cent. of fat in milk.	Amount of alkali necessary to neutralize acidity of milk.	Rennet test for ripeness.	Temp. of milk when test was taken.	Amount of extract used per 1000 lbs. of milk.	Time required until coagulation begins.	Time required until ready for knife.	Temp. to which curd was heated.	Time required to cook the curd.	Amount of alkali necessary to neutralize acidity of whey.	Time from adding rennet to putting to press.	Weight of green cheese.	Lbs. of milk to 1 lb. of cheese.
1894.			c. c.	secs.		ozs	mins.	mins.		mins.	c. c.	mins.		
Feb. 7	235.25	4.9	14	140	88°	15.6	7	16	94°	41	8.7	110	31	7.58
" 8	538.50	4 8	14	180	88	8.9	7	20	95	29	8.7	115	31.83	7.61
" 9	233.75	5.0	14.5	100	88	11.6	6 5	18	100	17	9.2	86	30.75	7.60
" 10	121	5.2	13	70	87	11.0	5	17	96	46		92	16.87	7 17
" 14	156	4.7	13.5	85	88	11.10	6	22	99	64		117	22	7.09
" 15	223.75	4.8		70	89	11.0	5	13	99	65	8	90	31.12	7.12
" 19	115	4.9	13.5	60	94	9.0	5	13	100	34	8.3	79	16.12	7.13
" 20	50	5 1		75	88	3.0	15	35	101	38	7.6	102	7.25	6.89
" 20	50	5.1		75	88	9.0	6.5	16	100	43	7.6	84	7	7.14
" 28	83.5	4.7	12.4	85	88	8.2	6	18	100	48	7.6	91	11	7.60
Mch. 3	64	4.4	13	75	10	8 9	7	13	100	31	7.8	72	8.62	7.54
" 5	60	5.0	13	60	90	7.1	7	15	100	38	7.8	75	8.5	7 05
" 6	60	4	11 6	90	86	10.6	7	15	96	39	7.4	81	7 5	8.00
" 7	50	3	13	90	84	10 6	6	14	96	22	7.6	59	5.5	9.09
" 8	60	4.5	12.4	60	90	7.1	6	13	100	21	7.4	66	7.5	8.00
" 9	60	3.5	12.4	60	90	7.1	5	10	100	35	7.4	72	7	8.57
" 10	60	4.5	13.2	60	90	7.1	6.5	13	100	25	7.6	60	8.25	7.27
" 21	60	4 7	12.4	60	90	7.1	6	15	102	24	6.6	54	7.78	7 71
" 22	60	4.7	12	70	90	8.4	6.5	14	100	33	7	69	7.78	7.71
" 31	90	3.35	12 2	65	90	7.7	6	12	96	24	7	65	10.7	8.41
Apr. 5	90	3 3	14	60	86	7 1	7	14	86	38	8	77	10.8	8.33
" 7	90	3.1	12 2	70	86	8.3	6 5	12.6	96	26	7	67	10.6	8.49
May 8	140	2.5	12.2	70	88	8.3	6.5	14	98	40	7.2	97	14.3	9.70
" 9	165	2.6	12.6	75	88	8.8	7	15	98	40	7.2	99	16.5	10.00

"B"—Tabulated Statement of Process in the Manufacture of Gouda.

Mch 12	100	4.50	12.4	70	90	8 2	6	18	102	45	7.4	76	12	8.33
" 13	100	4.20	12.6	60	90	7.1	6	18	100	44	7.4	77	14	7.14
" 14	100	4 90	13	60	90	7.1	7	21	100	39	7.2	80	14	7.14
" 15	100	5.00	13	60	90	7 1	8	24	100	39	7	85	14	7.14
" 16	100		13	60	90	7.1	6	18	102	18	7 6	51	14	7 14
Apr. 9	100	4.86	13	60	90	7.1	6	18	98	107	7	87	14.1	7.09
" 11	100	4 22	12.4	65	86	7 7	6	19	98	60	7	99	13.5	7.33
" 12	100	4.50	12.4	70	90	8 5	6	18	98	60	7.4	93	14 1	7.09

In the table it appears that with milk testing three per cent. fat and under, it required 9.59 pounds of milk for one pound of green cheese, that testing over three and under 4.6 per cent. fat required 8.07 pounds, and that testing 4.6 per cent. or over required 7.26 pounds.

GOUDA CHEESE.

For a number of years there have been numerous inquiries as to the best method of manufacturing cheese in the farm dairy. The answers to these inquiries have uniformly been a lengthy description of the cheddar process, which is not at all adapted to home work. By this process a whole day is required, even when a single cheese is made. What the isolated farmer needs is a short process which requires a small outlay only, for apparatus. After a careful study of the methods employed in the manufacture of the numerous foreign brands, the Gouda has been selected as the one best adapted for the home dairy. First, the milk is worked warm, fresh from the cow; second, it requires only about an hour to do the work; third, the cheese can be cured in a cellar or in any damp, cool place; fourth, it is a good keeper, and fifth, it is nutritious and palatable.

It is largely manufactured in southern Holland, where climatic conditions are very different from those which exist in the northwest. In Holland, the cheese is made similar in form to American flats, except that they are smaller and the upper and lower edges are rounded. They weigh about eight pounds and because of the short and simple process of manufacture are well adapted for home dairies. It is made from whole milk and should be set fresh from the cow. To prevent cooling, it should be poured into a wooden vat lined with tin or copper, having a dead air space between the wood and the lining, which prevents rapid cooling. We used the Curtis Improved Self Heating vat. If color is used, one dram to 150 pounds of milk will give about the proper shade. The temperature of the milk when the rennet is added should be from 88 to 90 degrees. Enough rennet should be used to make the curd ready for the knife in fifteen to twenty minutes. This will require from seven to twelve ounces of rennet to 1,000

pounds of milk, according to the strength of the rennet. To ascertain when it is ready to cut insert the finger into the milk at an angle of 45 degrees until the thumb touches the milk, gently raising the finger, and if the curd breaks clean across it leaving but few or no flakes, it is ready. A little practice will soon teach one when the curd cuts to best advantage. The general tendency of the curd should be toward softness. Cut the curd about as fine as small kernels of corn or large peas. If one is pressed for time smaller cutting will secure quicker cooking, but the loss of fat and casein in the curd will be greater. The curd not being cut as fine as with Edam, the temperature is raised to 102 or 104 degrees, which should occupy from twenty to thirty minutes. The curd should be stirred during the whole process, and when ready for the mold it should be quite firm and make a squeaky noise when chewed.

FILLING THE MOLDS.

Now let the whey run off or dip it out, then fill the mold at once by taking a double handful of curd and pressing it into the mold. Care should be taken not to allow the curd to drain too much before it is put into the mold, as it will then be too dry to pack readily. When the mold is full take the cheese out, turn it and replace it in the mold, put on cover and put under press for an hour. The pressure should be light at first.

The press may be an oak stick four inches square, twelve feet long, one end to rest under a slat nailed against the wall or a tree; place the cheese mold under the stick about three feet from the wall. On the other end suspend a pail or box containing cobble stones; during the first hour the pail should hang some two feet from the outer end of the stick. The cheese should then be taken out for dressing, which is done by taking a piece of cloth about six inches wide and long enough to go around the cheese. Dip cheese and cloth into whey or water at about 120 degrees Fahrenheit. Wrap the cloth smoothly around the cheese, folding the edges carefully over the sides, put a linen cap on each side, replace in mold and again put it under the press; now move the vessel containing

the stones or other weights toward the end of the stick, to increase the pressure. Leave it in the press from eighteen to twenty-four hours, at which time it will be ready for salting.

SALTING AND CURING GOUDA CHEESE.

This is done by rubbing the cheese all over with salt once a day for six to ten days, according to temperature, moisture and desired keeping qualities. The cheese should be turned every day. Sometimes brine salting will bring better results. Make a brine as strong as possible; let the cheese float in it from eight to ten days, turning every day and sprinkling a little salt on top. When salted they should be washed in warm water, wiped dry and placed on the shelf for curing. The salting is done much the same as with Edam. If the cheese is to cure rapidly four or five days in brine will do, but if they are to be good keepers it will require from six to eight days. The longer they are in the brine the more moisture is expelled. When taken out of the brine they should be washed in warm water, wiped dry and placed on the shelf and handled the same as Edam.

They should be rubbed and turned daily the first month, twice a week the second and once a week the third month. If they are slimy they should be washed in warm water with a soft brush. If a whitish fungus makes its appearance on the cheese a little vigorous rubbing will destroy it. The cheese is ready for use in from two to six months, according to the amount of cooking and salting. High cooking and salting has a tendency to retard the ripening process.

As a moist and cool curing room is necessary for the proper curing of all cheese I will briefly state how the degree of moisture may be known. If a hygrometer cannot be secured, take two thermometers which indicate exactly the same temperature, cover the bulb of one of them with candle wick or some flannel cloth, the end of which drops into a small vessel of water. By capillary attraction the bulb will be kept moist. Hang the two thermometers side by side in some convenient place in the curing room. The difference in the temperatures indicated by them will show the degree of moisture in the room. The dry bulb thermometer indicates the temperature

of the air in the room; the wet bulb thermometer indicates a lower temperature because of the evaporation of the water from the bulb. The dryer the room the more rapid the evaporation and the lower the temperature indicated by the wet bulb thermometer.

TABLE.

Dry Bulb.	Difference Between the Reading of the Two Thermometers.						
	1	2	3	4	5	6	7
50	92	84	76	71	64	57	50
51	92	84	77	72	64	58	51
52	92	85	77	73	65	59	52
53	92	85	78	73	66	59	53
54	92	85	78	73	67	60	53
55	93	85	79	74	67	61	54
56	93	86	79	75	68	61	55
57	93	86	79	75	68	62	56
58	93	86	80	75	69	64	57
59	93	86	80	76	69	63	57
60	93	87	88	76	70	64	58
61	93	87	80	77	70	65	59
62	94	87	81	77	71	65	60
63	94	87	81	77	71	66	60
64	94	87	81	78	72	66	61
65	94	88	82	78	72	67	61
66	94	88	82	78	73	67	62
67	94	88	82	79	73	68	62
68	94	88	83	79	73	68	63
69	94	88	83	79	74	68	63
70	94	89	83	80	74	69	64

If the dry bulb indicates a temperature of 60 degrees and the wet bulb indicates two degrees lower we find the moisture of the room to be 87 per cent. of total saturation. And if the dry thermometer shows the temperature of the room to be 65 F. and the wet bulb shows a temperature 4 degrees lower the moisture in the room is 78 per cent. The temperature in the room should not go below 55 F. nor above 65 F., and the moisture should not drop below 65 nor go above 95 per cent. total saturation.

If a room is too dry the moisture can be increased by hanging linen cloths in front of the shelves, the lower end reaching into a vessel containing clean water. By capillary attraction the cloths will be kept wet and the evaporation will keep the air in the room moist.

DISCUSSION.

Mr. Phillips—Is there such a thing as having too rich milk to make Edam cheese from?

Prof. Haecker—We have found that there are certain makes that are inclined to check a little, but I could not say that that is entirely due to the milk being too rich.

Mr. Phillips—Aren't they more apt to check with milk that is skimmed?

Prof. Haecker—I don't think it is so with a partial skim milk. Last April we spent three days in close experimental work in making Edam. One was a partially skimmed milk cheese, and there isn't a particle of checking in it, while the others that are full milk cheese have checked a little, during this session of the dairy school. Of course, they are now nearly a year old.

Prof. Russell—Is this checking due to the gas?

Prof. Haecker—Oh, no, not at all. The temperature that these cheese were under was not a favorable temperature; it was too cold, probably nearly down to forty.

Mr. Downing—How about the market value of this cheese? Are you making cheese in Minnesota that will compare as favorably and sell as well as imported cheese?

Prof. Haecker—We have sold quite a number of our last winter's make, and those parties that have bought, who are competent judges, say that some of them are equal to imported cheese, but we can never get a top price for a cheese that is not the proper form, no matter how good it is, and we have never before had the proper molds.

Mr. Downing—If the flavor is the same, why wouldn't the cheese fetch as much money?

Prof. Haecker—You see people are very notional about such things, just as they require butter to be colored, though butter uncolored is just as good. I consider this cheese specially adapted for family use, not for factory work, but for home dairy cheese. You see we have colored this one with saffron, because that is the way they dress them in Holland.

Mr. Downing—The professor talks of Wisconsin, or any

other state, experimenting in making fancy cheese. Do not the localities, in which those cheese are made, take, for instance, the Roquefort, give the required flavor, and can it be given in any place in America?

Prof. Haecker—I don't know. I haven't tried the Roquefort.

Mr. Downing—Is there any flavor about the imported Edam that cannot be gotten in this country?

Prof. Haecker—No, sir. There is a little difference between Edam and Roquefort. The conditions are so unusual in the Roquefort that it is difficult to get them here. You will notice that we have adjusted ourselves to the requirements of our cheese. We have a curing room that does not get below 55 degrees or above 65 degrees and contains a very high amount of moisture, as they have in those countries.

Prof. Russell—I am told that one of the Canadian cheesemakers sent to France and secured some of the mould that is present on the walls of the factories where Roquefort cheese is made, and he made as good cheese as is made in France. The mould that is concerned with the Roquefort cheese is nothing but the ordinary blue-green bread mould, such as you find upon bread after it is mouldy.

A Member—Would it not help the price of these cheese to send them to the old country, then bring them back to Milwaukee with a foreign brand on them?

Prof. Haecker—Our New York state full cream cheese sells in Minnesota and it comes from Wisconsin.

Mr. Burchard—Do you consider the Gouda cheese adapted for domestic manufacture?

Prof. Haecker—Yes, sir, on account of the simple process and apparatus required.

Mr. Burchard—How long does it take to make such cheese from the setting of the milk to getting it into the press?

Prof. Haecker—It takes from fifty-five minutes to double that time; it depends on how you get it.

Mr. Burchard—The professor had a dairy school for girls and women up in Minnesota last summer, and he commenced at one time to try to teach cheddar cheese making, and one of the young women made the remark, "Oh, dear, we never can

make cheese and do the rest of our housework. It takes all day to make a cheese." So he went to work to teach them how to make Gouda cheese, and instead of taking all day it takes from fifty-five minutes to double that time.

Prof. Haecker—The beauty of it is, you don't ripen the milk. You make a Gouda cheese in simply a boiler or washtub; you put the warm milk into the tub, and then add the required amount of rennet, and in the course of fifteen or twenty minutes it will be ready to cut; then you can pour in some more hot water, or draw off part of the whey and warm it up, and cook the whole in that way. The cooking and salting are very important matters, on account of the heating qualities of the cheese.

SOME UNDESIRABLE BACTERIA IN CHEESE-MAKING.

Prof. H. L. Russell, Bacteriologist, Experiment Station, Madison, Wis.

Somebody has said that there are big devils and little devils in this world, and it behooves us to know the relation which we hold to these large and small devils. This same man said he didn't care so much about large devils because he could get a hold of these, but it was some of these little, small devils that bothered him the most. It is concerning some of these little devils about which I wish to talk to you today.

It will be needless before this convention to dwell at any length on the general relation of bacteria to cheese making. Every well informed maker is familiar with the fact that the curing changes, and the production of the desired flavor in cheese is largely dependent upon the presence of bacterial life. He may not have been fortunate enough to have actually seen them at work, but nevertheless he directs a large share of his efforts toward the carrying out of conditions that aid and abet the growth of these tiny organisms.

He has learned to do this, from the first, from the standpoint of experience alone, but later he has found the reason

why this line of action was necessary, and with a more thorough comprehension of the causes that underlie these changes, his labors have been more intelligently directed.

Most of you are doubtless familiar in only a general way with the status of investigation concerning the exact effect of different kinds of bacteria on the maturing of cheese, so that a brief statement of our knowledge of these organisms, especially in relation to cheese made according to the cheddar process, may not be out of place.

We may fairly sum up our knowledge concerning these changes by saying that we know that bacteria are present in cheese in overwhelming numbers, that here they find conditions favoring their rapid increase, that these bacteria are derived from the milk and that without the presence of these low forms of organized life the natural curing of cheese will not take place. So much is certain, but farther than this our knowledge of the exact influence that any particular form has in this process is extremely meager.

The field of dairy bacteriology is as yet scarcely outlined, and where explorers are few it is not possible to make rapid advance. The obstacles to be overcome in studying the relation of these organisms to cheese, present especial difficulties that do not obtain in other lines of this biological study of milk and its products.

First. We cannot free milk entirely from all bacterial life so that we can study the effect of any particular form without changing the relation of this fluid to the rennet so that many technical difficulties arise in attempting to make cheese from pasteurized milk.

Second. The lapse of time necessary to determine the effect of any peculiar form in cheese is so long that advance is necessarily slow where we have to deal with a large series of different germs. Working, as most of us are obliged to do, from the practical side, we are forced into a consideration of special troubles, their cause and how to prevent them, rather than a fundamental study of the natural changes that occur in good cheese.

Just as the services of the physician are demanded for the treatment of some special diseases more than the physiolo-

gist who teaches us how an organ is constructed and how it should be treated to keep it in good repair, so the demand is constantly made for a cure for these numerous defects or troubles in milk rather than an understanding of the way in which the normal changes in the cheese take place. Our attention is forced into the healing and prevention of cheese diseases rather than a study of the normal physiological changes that occur in the normal ripening process.

One of the most troublesome and at the same time widest spread diseases or defects in cheese is where the fermentation changes partake of a gassy nature. The fermentation of gas in milk before it is made up into cheese, or at the various stages of the manufacturing process are to be included under this general head. They are well known to almost every cheesemaker and have received a number of different distinctive titles that serve to designate some special phase of the gaseous fermentation.

Over ripe milk may be frothy and foamy, the curd when cut may rise to the surface of the whey, when it is called a "floater" or "bloater" and the whey itself may be foaming violently. The development of gas may be delayed until after the whey is drawn when it appears in the fresh curds while still on the rack, in which case it is called a "pin hole" curd. Then again, the formation of gas may not occur until after it is taken out; a fermentative period at this stage results in the "huffing" or swelling of the cheese, that may be so violent that the cheese is unable to stand on the shelves and is blown up into a football shape. The imprisoned gas, seeking to escape from the inside of the cheese, cracks and snaps as it finds its way slowly to the outside, or it may be so violent as to burst open the drying exterior in cracks of considerable size.

It is concerning this series of abnormal changes that I wish to speak more in detail today.

First. Are all of these different conditions manifestations of one trouble or are they related, yet distinct maladies?

An answer to this necessitates a knowledge of the exact cause and when we have found this out we have gone a long way toward a better understanding of the trouble. The

anti-toxine for diphtheria would in all probability never have been discovered had it not been for the previous discovery of the special germ able to produce this dread disease. By first finding out the true cause and studying the effect of this in different ways this valuable discovery was brought to light.

In the same way we hope for advance in the study of dairy troubles. This is true in general, whether the difficulty is due to some error in handling the milk or to feeding or to some other cause.

More especially is it necessary to know the cause of a trouble when the defect is due to some biological reason, for in troubles of this sort there is a certain degree of contagiousness and a consequent danger of greater loss.

If we look carefully into the subject of the gaseous fermentation of cheese it will be noted that the sugar in the milk is the principal element affected, for the fermentation goes on as violently in whey from which the casein is separated as in milk, especially if the acidity of the whey has been neutralized by the addition of some alkali.

Looking at the matter from a standpoint of a fermentation it is easy to see from the analogous condition that we always find in saccharine solutions, that the trouble is undoubtedly due to the presence of a living organism capable of decomposing the sugar in the milk and giving off gaseous products.

To prove this hypothesis we have made cheese from milk that has been heated sufficiently high to kill the bacteria in a vegetating condition and have found that this stopped the rapid development of gas that always occurred in the control.

Likewise the addition to tainted milk of certain chemicals having a disinfecting or germ killing action would inhibit in every case the development of the gas.

These experiments point conclusively to the fact that the production of gas either in milk before or after it is made into cheese is associated with the presence of a living germ that can be killed in the milk.

It now remained for us to demonstrate what particular organism or organisms possessed this property of fermenting milk with the evolution of gas.

Most of the fermentations common to sugar solutions are marked by the evolution of CO_2 and the production of alcohol. The sugar in milk, however, does not easily undergo an alcoholic fermentation. In most instances fermentations of this nature are to be traced to certain forms of yeast cells, but yeast organisms are relatively scarce in milk under ordinary conditions and it was hardly to be expected that this widespread difficulty would be found to be caused by a germ so rarely found in milk.

The only way to study the question further was to separate all of the different organisms that were present in the milk and study the effect of each of these in milk, especially to see what change was made in the character of this fluid.

In any given sample of milk there is always to be found, under natural conditions, a very large number of germs. Usually a few species make up the majority of individuals and then there is a large number of species that are represented by a relatively small number of germs. By laboratory methods it is possible to separate from any given sample of milk all of the different forms that will thrive in gelatine, and determine in this way the exact bacterial population both as to numbers and as to kinds. If we examine milk in this way we will almost always find a few representatives that are able to form gas in the milk. Under natural conditions the number of these gas producing organisms is relatively small and as there is a constant struggle going on between these forms and other species prevalent in the milk they are in such a minority that they are unable to make any marked change in the ordinary character of the fluid.

If, however, the milk becomes seeded with a large number of these gas producing organisms in any way and they gain the ascendency, then it will present a very different condition. Instead of undergoing a pure lactic acid fermentation the milk will sour in a somewhat different manner.

Lactic acid will be formed, it is true, but in addition to this acid there will also be present in the milk various gases such as H and CO_2 and volatile substances that give the peculiar taint that is found with these gassy fermentations and which is a common odor in factories that are troubled in this way.

The gas forming germs in almost all cases belong to the lactic acid bacteria. They live on the sugar element in the milk, breaking down this nutritive substance and forming certain organic acids like lactic and others, and at the same time giving off certain gaseous decomposition products. They differ from the pure lactic acid ferment that splits up a sugar molecule into two molecules of lactic acid, in that they give off gaseous products during the fermentation.

These organisms are relatively common in milk. In one sample taken from the university creamery last summer we separated six different forms that possessed this gas producing function. There is a marked difference in the ability of different germs of this class to produce gas, some possessing this peculiarity to a much greater degree than others. Those forms that are the most intense gas organisms are naturally of more consequence in the factory than those that have the faculty less marked.

Now, a word as to the source from which milk is infected with the gas forming germs. Growing as they do at the expense of the milk sugar they are exceedingly well adapted for growth in this medium, so that if they are once introduced into the milk they find a most favorable place to develop.

Our studies in this line have not been wholly completed so we can not state with certainty the natural habitat of these organisms in all cases. As a matter of practical experience, we know that taints that are associated with troubles of this character are due to dirt and carelessness in most cases; that where milk is not properly cared for, organisms find their way into it easily and undesirable changes rapidly occur. Care in regard to cleaning the milk vessels and the under parts of the cow will doubtless aid materially in eliminating these troubles, especially if the milk is cooled down and held at a low temperature immediately after it is drawn.

In some instances we have found these gas producing organisms to be present in the milk as soon as it was drawn, even where the best of care was taken during the milking. In these cases, the germs were present in the lower portion of the milk duct and as they were milked out into the pail the whole milking was contaminated.

Organisms of this sort seem to thrive especially well where the temperature is kept above normal. The production of acids in any considerable quantities seems to interfere with their development. Most forms of bacteria prefer food in an alkaline to an acid condition, although in some instances, certain kinds of bacteria seem to be able to stand a considerable quantity of acid. Acid is a common by-product of bacterial growth and it is a well understood fact that many forms limit their own ability to develop by the production of more acid than they can endure; for instance the ordinary lactic acid fermentation is checked naturally when the amount of acid exceeds about 0.8 per cent. This limit is quickly reached with many of these gas organisms. This explains the reason why the fermentation that is seen in pin hole curds is so quickly checked when a large amount of acid is rapidly developed.

The size and form of gas holes found in the curd or in the green cheese is not usually due to different kinds of germs but is caused more by the manner of distribution than anything else. Of course, those organisms able to generate a large amount of the gas are usually associated with the production of larger holes but aside from this the way that the germs are distributed throughout the milk influences the size of the gas holes materially. If the infected milk is thoroughly stirred, so as to distribute the organism, the size of the gas bubbles is correspondingly reduced and we find the pin holes remaining of small size, while if the germs for any reason adhere in small clumps to each other then the gas hole that is produced will be much larger in size. Very often one notices that the size of the gas bubble is dependent somewhat upon the temperature at which the curds is kept, that with increasing heat the bubble is apt to increase in size. There are two reasons for this:

1. That the gas formed is expanded by an increase in heat.
2. That increase in temperature hastens the rapid development of the gas organisms and consequently an increased evolution of the gas at any special point.

So much for the gaseous decompositions that are found in milk. The next question, after having found the cause, is to find a way of curing the same. The sick man calls the doc-

tor and he asks him to cure him, not to tell him the cause of his ailment; so the factory man cries for help in the same way. But the doctor to cure a patient must know the cause of the trouble and then select his medicine to suit the special case on hand. This he can only know by the results of others who have patiently studied the malady and have traced it to a given cause and then developed a rational treatment in the light of this discovery. The doctor that treats intelligently treats in this manner. Now our knowledge concerning the remedy for these troubles is yet too meager to be of much service to any of you. Just as medicine has learned by experience that certain remedies are good for certain cases, without having any good reason for the same, just so the factory man has developed a rule of thumb methods that aid him in suppressing these troubles. One of these methods—the rapid development of acid—appears in this new light to be based upon rational grounds and this is only another proof that the experience of the practical man is after all a pretty sound basis for belief.

If we cannot effect a cure that will enable you to make extra fine full cream products out of half rotten milk we can detect the presence of these gas organisms in milk early enough so that matters may be materially helped.

This is now done by means of certain fermentation tests, but as at present used, most of these are quite crude and susceptible of certain changes that will greatly increase their efficiency.

The method of setting aside a small quantity of milk in a small tube and allowing it to stand for some time is a crude way of determining whether gas producing organisms are present or not. As the milk increases in age the gas accumulates in the soured product and becomes visible to the naked eye.

This method can be much improved by boiling the tubes so as to rid them of all adherent bacteria and then place in them the requisite amount of milk, adding to each a small quantity of rennet which will rapidly coagulate the milk. If this is then kept at a warm temperature so as to favor the rapid growth of the living organisms in the milk, only a few hours are necessary before the gas bubbles will appear in the curdled milk and as they accumulate and force their way to the sur-

face they leave behind a rent or split in the curd betraying their passage. In using tubes in this way, it is wise to plug the open end with a small piece of cotton so as to prevent the germs from the dust from falling into the tubes.

In this way each patron's milk can be determined for any day and so those persons that bring infected milk can be distinguished easily from those that bring a sound and wholesome product.

A rejection of these contaminated milks prevents an infection of the whole supply and in this way it is possible to avert material loss by exercising forethought in this regard.

We must at all times remember that these troubles are due to germ life and if the milk is kept under conditions that favor the development of this life that the production of these taints and troubles continually increase.

Only by holding this rich nutrient fluid under conditions that are unfavorable for bacterial development can the multiplication of these infinitely little organisms be checked and held in abeyance.

DISCUSSION.

Mr. Aderhold—In making this test at what temperature should the milk be held?

Prof. Russell—These gas organisms like a higher temperature than is necessary for the development of the ordinary sour milk forms, therefore, if the temperature is kept at about blood heat, the gas organisms, if present at all, will thrive rapidly. From 90 to 100 degrees I should say would be the most favorable temperature.

Mr. Phillips—When you put the milk in these little tubes, how much rennet would you add to each tube?

Prof. Russell—We have usually tried the experiment with an ordinary milk-tight bottle, and to half a pint of milk, we add about a cubic centimetre of rennet. Of course, where you use a small test tube, probably two or three drops would be

enough, simply enough to coagulate the milk. Then as the gas is forced up through the milk you can see it more easily than when the milk is in a liquid condition.

Mr. Noyes—You would have to keep them in a warm place.

Prof. Russell—Yes, put them in a cask such as the ordinary Monrad fermentation cask, or set them in a room where the temperature is comparatively high.

Mr. Grengo—How long would it be necessary for these glass tubes to stand before you could tell?

Prof. Russell—Twelve hours. If you take a sample of milk from the weigh-can today, before the man comes tomorrow, you can tell whether his milk is of that character, and if you find, after two or three tests, that his milk is troubled in that way, you will know that it is affecting the whole body and can state the facts to him. We have been able at the university experiment station to pick out of the thirty or forty men who bring milk, the ones who brought the milk that developed these gas organisms.

Mr. Grengo—Could those men, after being told about the quality of their milk, find the cause and change it?

Prof. Russell—That condition probably arose from conditions of filth, either in regard to the milk or to the handling of the milk after it was drawn from the cow, and what was required was a radical method of steaming or cleaning their cans with scalding water and greater attention in securing milk.

Mr. Grengo—Might it come from the whey vat, the whey being carried back in the milk cans?

Prof. Russell—Yes, there is a very fruitful source. A factoryman near Madison informs me that he found all of his trouble arose from those patrons who insisted upon taking home this material in their cans. Others who use a double set of cans escaped this difficulty.

Mr. Phillips—I found out of nine cows seven were giving gassy milk in a certain herd.

Prof. Russell—That man needs to look to his milk cans and pails.

Question—Would not weeds affect the milk?

Prof. Russell—Weeds themselves do not have any effect upon the bacterial contents of the milk. If the animal is in the

habit of wading through slimy pools or being where there are large quantities of fermented material and gets them onto the body, or onto the teats, they are carried in that way into the pail. There are some aromatic substances like the principles in onions and garlic that affect milk but that is different to this proposition. The milk pails should be flashed with solder so that there are no square angles, and then they should be cleaned with scalding water or steamed.

Mr. Burchard—Have you made any experiments as to the aeration of milk?

Prof. Russell—No, I have not, but I do not see how it can affect the bacteriological contents of the milk.

Mr. Burchard—I should judge that these harmful bacteria produce carbonic acid gas. Now, that has a tendency to give way before the oxygen in the air.

Prof. Russell—I hardly think that explains it. We are totally in the dark as to the effect that aeration of milk has upon the keeping of milk and making it better for cheese-making.

Mr. Burchard—From the correspondence that passes under my observation from week to week I am led to believe that there is a very considerable lack of information in regard to the character of this bacteriological life, as to whether it is vegetable or animal. You speak of them as living organisms.

Prof. Russell—They are vegetable in their nature—in fact minute plants.

A Member—Can you give us any light on the nature of ropy milk?

Prof. Russell—Yes, ropy milk is produced by a series of organisms that either affect the sugar of the milk, or by the multiplication of the germs themselves, have a sort of gelatinous covering which forms this viscous mass. They can be eliminated with scrupulous care in regard to the milking utensils.

The Member—How would you manage it when it comes from the cow?

Prof. Russell—I never heard of such a case.

The Member—There was a case not long ago where there was one cow where it showed immediately after milking.

Prof. Russell—That is an unusual case. The way to tell whether a trouble is bacterial in its nature or from some physiological cause is by noting the age in the milk. Whenever you find a certain characteristic present immediately after the milk is drawn, you may be certain it is not due to bacteriological causes. Whenever it increases with age in intensity, then it is pretty good proof that it is. They get into the milk after it is drawn from the cow, then they multiply, and accumulate so that as the milk becomes older and older this trouble becomes more pronounced.

Question—Might bacteria come from the feed?

Prof. Russell—It might from the dust that comes in the air. The bacteria that go into the stomach of the cow do not pass to the udder. The milk in the udder of a healthy cow is free from germs.

Question—What causes bitter milk, especially during the latter part of the period of lactation?

Prof. Russell—It is a notorious fact that as you advance in lactation, there is a peculiar bitterness that is not due to bacteriological trouble, and you have on the other hand effects of bacteriological organisms that produce a peculiar, bitter taste, which may be transferred to butter and to cheese. These differ—there are forms peculiar to the winter and also some peculiar to the summer months.

Mr. Aderhold—When frozen milk is thawed has it the same physical character that it had before it was frozen?

Prof. Russell—There is, of course, a greater separation of the fat globules by the freezing process and it is harder to thoroughly mix the fat globules with the milk after it is once frozen. That is the difficulty that is found in preserving milk by the frozen process. Milk in London is now frozen in blocks and shipped that way, and it will keep for a week or two, but after being thawed out, it is hard work to re-incorporate the fat with the milk.

Question—Will not a bad smell in the trough where the cattle drink cause trouble in the milk?

Prof. Russell—Not in the milk itself; nothing that the animal eats is present in the milk itself.

Member—I have found a sediment in milk immediately after

milking, and I have found that after the drinking trough was cleaned out, it stopped.

Mr. Deitrich—Are the same bacteria found in milk that are present in water?

Prof. Russell—No, not usually. The bacteria found in water, of course, do not have the food supply offered them that would be present in milk. There are certain kinds in each.

Mr. Deitrich—In what kind of water are the least found?

Prof. Russell—In spring water, unless it is a well which is pumped constantly, or a great deal of water pumped out of it.

Mr. Deitrich—Which is the healthiest water for us to use?

Prof. Russell—That depends somewhat upon the mechanical composition of the water.

Mr. Deitrich—I have a whey tank which I clean out twice a week with gold dust and warm water, and one or two days after it has been cleaned out, there is a slimy black substance on it.

Prof. Russell—You can very easily tell whether that is of germ character, by putting a little of it in boiled milk and if the milk is rapidly changed, you may be certain that it is due to some living organisms.

Mr. Curtis—How would you milk to keep the bacteria out of the milk, and get the milk to the factory in such shape that it will make good, wholesome, sweet cheese?

Prof. Russell—I am afraid if I should tell you the way I would do it, you would say it was not practical. In the first place the vessels in which the milk is put, want to be as free as possible from germ life. Wherever you find filth or dirt there you find bacterial life in abundance. When you can run your fingers around your milk pail and get a lot of dirt on your hand, that is pretty conclusive that you have enough bacteria in there to give your milk no fair show. Then again, the milker sits down without carding or brushing off the dirt which the animal has accumulated in the barn and begins to milk. Those scales or particles of filth are continually dislodged by the motion of the milking, and fall in the pail. That can be avoided by carding and brushing, and then washing off the udder with warm water, so as to prevent these particles being dislodged. Then the milk should not be allowed to stand in the barn for

half or three-quarters of an hour, because a barn is always richer in germ life than the air of a good dairy room, and the milk can just as well be removed immediately after it is milked as to allow it to stand around the barn, and have this constant shower of particles settling in it. Those are the main sources of infection. In addition to that you might mention the first few streams of milk that are present in the udder. The milk duct is open at the lower extremity and as the animal lies upon the floor, or walks around, of course, these germs get into the opening a short distance, so that the first few streams from the udder are very much richer in germ life than that that comes afterwards, so that in some cases it is wise to milk into a different pail the first two or three streams; we have tried these experiments time and time again and have found that where the milk was kept in exactly the same conditions that we have been able to keep that later milk eight, nine and twelve hours longer than the first of the milking.

Mr. Curtis—What do you think about the milker wetting his hands with milk before he begins?

Prof. Russell—That is all right, if he dries his hands so that they don't drip. I don't advocate having dirty water run into a pail any more than swept into a vat. The point is simply to moisten the surface of the animal so as to prevent the dust particles being dislodged. If you could throw a stream of sunlight under the animal you could see these little fine motes floating through the air, and every one of those contains forms of bacterial life that are constantly dropping down into the milk pail.

Mr. McKerrow—We hear it stated sometimes that milk will not take on odors while it is warm. Will bacteria fall into it while it is warm?

Prof. Russell—Yes, I think a man could fall into a kettle of soup when it was hot as well as when it is cold.

Mr. Robinson—What is the cause of the poisoning by cheese?

Prof. Russell—It is caused by bacteria that have the quality of producing a peculiar condition of things. Those are present in the milk and they may remain so whether that milk is made

into custard or ice cream, or whether it is consumed in the form of milk.

Mr. Allen—Is there any implement devised by which we can determine the presence of these peculiar organisms?

Prof. Russell—They need not necessarily cause harm to the human being; all these organisms affect the constitution of milk. The presence of bacteriological organisms in the milk are indispensible, but the bulk of them simply cause the natural processes in milk, for instance, fermentation. By a process of heating those can be in the greater part eliminated. These fermentation tests that I have spoken of do not give us all the information that we would like, but they are an aid in that direction.

Question—If the maker found that the milk had a small amount of gas in it, would you advise putting that milk in the vat and heating to 150 degrees for making cheese?

Prof. Russell—That can be done and it will kill off the organisms, but it affects the action of the rennet in the milk. It changes the phosphates in the milk in some way. We are working on that at the present time, trying to bring that pasteurized milk to a normal condition, but I can't tell you much about it yet.

Mr. Allen—We sent cheese heated up and cooled down in that way to the World's Fair, and it scored 97 points.

A Lady—What causes a red or pink milk in one teat and not in the other?

Prof. Russell—That is probably due to some minute wound in the interior of the teat that causes the blood to mix with the milk. The only thing to do is to allow nature to heal the wound.

Mr. Noyes—A gentleman here wants to know if gold dust is good for washing milk utensils?

Prof. Russell—I do not know what the composition of gold dust is, how much alkali it contains, but, of course, it is well to wash out all the alkali afterwards.

Mr. Aderhold—What difference have you found in the curdling of milk which has been sterilized and that which has not been sterilized?

Prof. Russell—When sterilized, it curdles very much slower,

and the curd when cut does not have that firm character that is so necessary in cheddar cheese, and also this curd does not break down after it is made into the cheese.

Mr. Meyers—Is salt good for scouring out milk cans?

Prof. Russell—It has a very weak antiseptic quality. I should think elbow grease would be much preferable. A combination might work a good result.

The Chairman—If it were possible to draw the milk from the udder, without having it come in contact with the air, into a sterilized bottle, how long would it keep sweet?

Prof. Russell—If the strippings of the milk were taken off, the milk would probably keep sweet for an indefinite time, until it dried up. Of course the udder is not an absolutely straight tube like a glass tube; it has little bends and wrinkles in it, and these minute organisms adhere to those to some extent.

REPORTS OF CHEESE INSTRUCTORS.

Report of W. H. Phillips, Waupun, Wis.

My last season's work for the Association began April 23 and closed October 13, '94. During that time I visited forty-one factories, representing a patronage of probably 1,000 farmers. Owing to the necessities of the situation, these factories were distributed over a large territory and in counties widely distant from each other. My visits included factories in Outagamie, Waupaca, Waushara, Sheboygan, Green Lake, Jefferson, Dodge, Grant and Calumet counties. Throughout the season I had no stated territory, but went whenever or wherever I was called, so far as was possible. Thus I was compelled to spend considerable time in traveling and consequently did not accomplish as much as I otherwise might have done.

Forty factories situated in adjacent localities would furnish sufficient work for one man if the best results are to be obtained. However, I am happy to believe that my work was not barren of good results and that considerable good was ac-

complished in the time I was able to spend in factories. Most of my factories received a second visit, and a few I was able to reach a third time.

This was my fifth season on the road, and the call for instruction was double what it has been any previous season of my experience and much more urgent. During the months of July and August especially, the calls came thick and fast—more than I could possibly attend to. This was owing, of course, to the hot, dry weather which caused more than the usual amount of trouble in factories. Just a word about the $5 fee asked from factorymen for instruction. So far from deterring men from having the instructor I believe there is more call for instructors than when their visits were free, and more than that, makers are more attentive and strive harder to profit by the instruction than when they received it free. That which we pay nothing for we are apt to value accordingly, and this has proven so in the matter of cheese instruction.

The greatest criticism I have to offer on the work is the bad shape in which most of the factories are found. Out of the forty-one factories I visited I found no more than ten really well equipped for cheese-making. Either the buildings were poor or badly arranged, or the apparatus was bad and lacking the proper tools to do good work. There is great need of reform in this matter. Many of the makers visited were dairy students, and the factories were most of them as clean and neat as circumstances would permit. It is hardly possible to keep an old unhandy factory as clean and neat as it should be. I found the spring milk as good or better than ever before, but later on, owing to drouth and neglect by patrons to take proper care, the milk was very bad.

One result of the season's experience has been to teach makers not to guarantee their goods. In my opinion it is a great injustice to makers for their employers to require this. A maker's reputation should be sufficient guaranty that he will do his best with the material placed in his hands. In the large majority of cases poor cheese is a direct result of poor milk, but this can not always be proven, nor can the maker always distinguish this bad milk until it has done its mischief. Hence the injustice of compelling him to pay for the careless-

ness of his patrons. And furthermore, it increases the chances of poor cheese since some patrons will not take pains with their milk if they know that the consequence of their neglect will fall not on themselves but on the maker.

An encouraging sign of the times is that I found a Babcock test in every factory I visited except one. Twelve out of the forty-one factories are paying by the test, and in these factories I find the yield is much better than where they follow the old plan of pooling the milk; that is, it takes less milk to make a pound of cheese.

One of the greatest obstacles to our work lies in the opposition of a certain class of buyers. I don't wish to include all buyers in this class by any means, for many of them are in favor of our work and aid us by their good words. But to a certain class the purchase of "off goods" seems to be an object as they make more money on such goods. Hence by their words they create a strong prejudice against our work which we find it hard to overcome.

Some unscrupulous buyers also have made a practice of buying subject to inspection and then cutting on the price though the cheese are good. The maker who is smart enough to refuse to submit to this is not a profitable subject for such buyers, and the instructor comes in for his share of the blame if he stands by the maker rather than to work in the interest of the buyer. A competent maker knows whether his cheese is good or not, and when he knows they are good he should stand up for his rights, the buyer to the contrary notwithstanding.

Convention adjourned to banquet, to meet at 9:30 o'clock next morning.

The ladies of the Eastern Star lodge gave an elegant banquet, and the lodge parlors were crowded with members of the convention. After the banquet, toasts and music, then to the Auditorium, the finest opera house in the interior of the state, where dancing was indulged in until a late hour.

POST PRANDIAL—G. A. MURRAY, Tostmaster.

1. Overture—Dana's Orchestra.
2. New London; Its Relation to the Dairy Interest—Col. G. T. Thorn, New London, Wis.
3. The Dairymen's Association; In the Hands of Its Friends—President C. E. Everett, Beloit, Wis.
4. Vocal Music—New London Quartette.
5. The Agricultural Press and The Farmer.
6. The Consumer; May His Shadow Never Grow Less—W. W. Gilman, New London, Wis
7. The Farmer Girls; They Rule the Boys Who Rule the Nation—Hon. H. C. Adams, Madison, Wis.
8. Song.
9. The Three B's; Brains, Butter and Beauty - C. F. Dexter, Chicago.
10. The Rising Generation; May it Prove the Real Cream of the World's Dairy—W. H. Hatten, New London, Wis.
11. The Old Fashioned Farmer.
12. Vocal Music—New London Quartette.
13. Some of the Farmer Boys of Wisconsin—Mrs. R. Howard Kelly, Chicago.

Convention met at 9:30 Friday, February 15, 1895.

The president in the chair.

The Chairman—Twenty-three years ago, a few men got together down at Watertown, Dodge county, and organized the Wisconsin Dairymen's Association. Six or seven gentlemen were present at that first meeting, and among them were ex-Gov. Hoard, Uncle Charlie Beach, Mr. Faville and Chester Hazen, and those men have continued ever since to work for the upraising of the dairy interest in this state. Among that number was one who was always known to us as "Uncle Fred" Curtis, of Rocky Run. We always call him "Uncle Fred" as we call Mr. Beach "Uncle Charlie," because they are kind of fathers to us. They have taken care of this industry all these years and we have come to love those old men because of their work. We haven't all of them present with us; the time is coming when we will convene and have none of them, and the work of this association will of necessity fall into other and

younger hands. We are glad that Uncle Fred Curtis is with us this morning. He has lived upon the farm that he now lives upon forty-nine years, and early came to be known as a successful dairyman, was early successful in winning prizes at our state fair and other places, where dairy products were brought in competition, and he has come to be an authority on dairy matters.

SHALL WE PATRONIZE THE CREAMERY OR MAKE UP THE MILK AT HOME?

F. C. Curtis, Rocky Run.

The question here presented is one of great importance and surrounded with so many difficulties that a satisfactory solution of it seems as far off as ever.

On looking abroad for comparative results in buttermaking we find by the market reports that creamery butter is quoted mainly under three heads, to-wit, extra, firsts and seconds, while that made by the farm dairies is quoted as firsts, seconds, thirds, and even lower, as *grease*. There is also butter made by the farm dairies that is sold in a private way for extra prices, which does not appear in the market reports, and we find also at large dairy exhibitions dairy butter comparing favorably with the creamery product.

Upon a further examination of our subject we find the successful creamery located where it can be supplied with plenty of good, freshly drawn milk and uses a separator to extract the cream. We also usually find that this creamery with its many conveniences was erected at a reasonable cost and upon common sense business principles. On the other hand, we find many unsuccessful creameries located in advance of sufficient cows to furnish the required milk and at a cost far exceeding their value, many of which, had they been judiciously planned and erected, might have been successful in a small way and in time grown to be valuable to their owners and the surrounding community.

Buttermaking by the private dairy greatly antedates creameries. Some twenty to twenty-five years ago I had heard of a little band of dairy reformers that were going to impart some surprising information at the state fair at Milwaukee. I was induced to attend with a crock of butter for exhibition, which failed to elicit any notice, and after the awards were made one of the committee being left to rearrange the butter, I approached him with inquiries for some book information or source of knowledge about buttermaking. He replied, "There is no such book or source of knowledge; we are surrounded by the grossest ignorance and if we would make any advances we have got to use our brains in teaching ourselves. True," said he, "there is Willard's book, that will teach you to keep things clean, which no doubt your wife practices, and some other matters beyond your reach. Then there is Gov. Pratt, of Prattsville, N. Y., who is advocating large open pans surrounded by cold water, which is not adapted to Wisconsin, and then there is Johnston's Agricultural Chemistry with a chapter on milk, but you are a dull old fossil if you can get any satisfaction out of that * * * "

Well, this little insight into the subject induced study which produced the shotgun can that was exhibited first at the Wisconsin Dairymen's meeting at Kenosha, some eighteen years ago, and was some years in coming into use, the advantage of which when understood is far beyond any other method of gravity cream raising, for the reason that the operator can command the temperature required for a fair separation of the cream from the milk.

This feature of cream raising has proved of great value to the farm dairy, but the separator is greatly in advance even of that method and is more readily an aid to the creamery than to the dairy, though when the dairy has eight or more cows, a separator should pay for itself in two years or less, in the extra amount of butter made, aside from other advantages.

Temperature is a requirement in buttermaking that cannot be ignored by any method of manufacture, a requirement that the dairy is more likely to be deficient in than the creamery; but the dairy that produces sufficient milk in two days to make a package of butter and that can command the required tem-

perature, also a few simple, inexpensive implements, should be able to make as good a quality of butter as can be made by any process; in fact better, for the reason that one person has the oversight of the milk and everything pertaining to the production of the butter, while the creamery is usually dependent on so many others that he cannot supervise the production of the milk that enters into his butter product.

If this is true the natural inquiry comes up, why does the dairy produce so much inferior butter? My answer to this inquiry is, that those who produce this bad butter do not put themselves in the way of information, or fail to take advantage of it when freely and plainly offered to them; in fact, they repel our teachings, which, if accepted, would save half the labor in making the butter and be the means of enabling them to produce a first class article. It is claimed by many that the creamery would remedy this great loss, and in many cases no doubt it would, but in many other cases it fails to bring about the greatly desired remedy. If two hundred or more cows could be kept within a radius of about half a mile or even more, and a creamery centrally located, the milk could be delivered at little cost and the butter could be made with less labor than at home, producing an extra fine article of butter and no doubt it would sell for more money than if made up at home. But the difficulties in the way of this happy result still remain in the form of unused creameries, monuments of fraud in many cases on one hand, and ignorance, stupidity and conceit on the other.

In conclusion I would say, that it is evidently our duty to encourage the use of creameries as far as possible, and also to spread information of the improved methods of butter-making at home.

Mr. Cate—Which do you consider the most particular point in making butter?

Mr. Curtis—The most particular part of it is raising the cream, and where the gravity process is used, it is question of temperature largely, and that temperature can be commanded on any farm. Then next comes the getting the cream ripened to the proper acidity.

MAKING AND MARKETING OF FARM BUTTER.

M. T. Allen, Waupaca, Wis.

When I received official notice from this Association that I was down for a paper to be read at this meeting, my subject to be, Making and Marketing of Farm Butter, there at once appeared before my imaginary vision an array of critics seldom outnumbered in meetings of this kind. My subject to many may sound a little off by several points, as compared to making and marketing of *creamery* butter, but let me say right here, that I have yet to taste the first creamery butter that excelled the make of very many private dairymen. Many keepers of small herds have an idea that to manufacture their own product 'tis necessary to have quite an array of machinery, which is not the case. Twenty-five dollars will cover all necessary apparatus with the gravity system. We have been told how and what to feed our cows, and the product therefrom will be good cream if procured with cleanliness. The cream from each milking should be put into a can large enough to hold a single churning and kept at a temperature of 50 degrees, stirring well every time new cream is added, until the required amount is obtained. Now warm up to 70 degrees to get the required acidity, then reduce the temperature to about 58 degrees, and 'tis ready for the churn, using one without inside fixtures, scald out the churn, then rinse with pure, cold water, put in the cream and coloring and proceed. The time required to bring butter to the granular stage should be from forty to forty-five minutes, stopping the churn when the granules are about the size of clover seed. Put in say one pound of salt, which, in our opinion, gives a better separation, giving the churn two or three turns, then draw the butter milk, using a strainer made by covering a hoop, about the size of the pail used for that purpose, with cheese or butter cloth; with this there will be no loss of butter. After the butter milk is drawn wash with cold water till the water is quite clear. Put in a portion of the salt, giving the churn a few turns backwards and forwards; add the balance and give a few more

turns, and the salt will be sufficiently mixed with the butter. Then work with ladle in the churn, what is necessary and no more, when the butter is ready for the package. Use such package as the market demands. If they are to be of wood, ash is the best. Rinse out with cold water, sprinkle sides and bottom with salt; then fill, not trying to pack too great amount at a time so that the package will be filled solid, with a sprinkling of salt between every layer, making it easier for the consumer to cut out. Fill package flush, then cut off with a stout thread even with top of same, as you would strike a measure of grain; cap with cheese or butter cloth, one thickness, cut circular, just large enough to cover package, no larger; put on dry and smooth and the moisture from the butter will hold the same; put on a thin layer of salt, work into the meshes gently removing all surplus, fasten on your cover, mark with stencil, then tag for address and we are ready for market. One of our greatest efforts is to have as neat and attractive packages as possible, knowing that neatness attracts the eye of many would-be purchasers. The farm dairy, like the creamery, must look beyond the local market for an outlet of its product in order to receive remunerative prices. We are quite well satisfied with private customers at a set price the year round, the surplus going to a commission house whose sales are satisfactory. With private customers we cater to their taste, and there is no trouble to hold them as long as we do our part well.

DISCUSSION.

Mr. Meyers—About how long would it take to go through the entire operation of making that butter from the time you go into the dairy house until you have your butter finished in the tub?

Mr. Allen—It can be done inside of an hour and a half and not hurry, churning thirty to forty pounds, although the size of the churning makes no difference.

Mr. Meyers—How often do you wash your butter?

Mr. Allen—I usually use about two waters, as a rule, after I draw the buttermilk. I use cold water as it comes from the well.

Mr. Meyers—Don't you find the butter too hard to work it immediately, if you wash it in cold water?

Mr. Allen—I don't work it except with a ladle to incorporate the salt immediately. The water is about 45 to 50.

Mr. Culbertson—You say you churn at 58. I churn at a temperature much higher than that and then the cold water leaves it in a nice condition for packing. I couldn't pack it at all if I churned at 58.

Mr. Allen—It will warm up a little after washing in a room fit for a person to work in.

Mr. Culbertson—It is a mistake to think that with all kinds of cows there can be a fixed temperature for churning. Everybody must learn for himself what temperature suits his conditions.

The Chairman—That is right, the temperature is all the way from 58 to 64 this time of year.

Mr. Granville—Do you want the water to be clear before you get through?

Mr. Allen—It certainly will not be perfectly clear. Butter can be over-washed, in my opinion.

Mr. Farnum—How long do you let your butter drain after washing?

Mr. Allen—That is according to circumstances. All the way from half an hour to two or three hours, to suit my own business; that is, after the salt is added.

Mr. Farnum—I find I cannot churn my butter except at about 70 degrees; mine are Jerseys.

Mr. Granville—There is a point in testing thermometers, they differ very much.

A Lady—How salt should the buttermilk be? I have found it sometimes too salty for the stock.

Mr. Allen—I never had any complaint in that respect from the stock.

Mr. Culbertson—A great many buttermakers claim they have difficulty in drawing the buttermilk off when they stop churning in the condition you speak of.

Mr. Allen—The only thing I know about it is for you to churn until the granules are sufficiently large to come to the surface. I think there will be a certain stickiness if your cream is too sour.

Secretary Curtis—How do you avoid butter running out of the churn with the buttermilk?

Mr. Allen—If the cream is churned at about 62 degrees, at a proper stage of ripening, which is when it has a shiny appearance as you pour it out, if it is then churned in a revolving churn, without inside machinery, you will find that the butter will float on top of the buttermilk, and the buttermilk will run right out when you take out the cork, and very little butter will run out. You can remove it with a skimmer and put it back into the churn. But if you have allowed it to get a little too sour, you will find your butter is of a mushy character, it don't separate from the buttermilk and then it will run out, and the finer the particles are the more it will run out. If you have that difficulty the better way is to put in a little salt with some additional water, if you don't care particularly about saving your buttermilk alone. Then you will find that with a few revolutions your butter will float on top and you can draw it off without any difficulty. By adding the salt you make the water heavier and your butter floats better.

Mr. Robinson—In churning sweet cream wouldn't you churn at a lower temperature than you would extremely acid cream?

Mr. Allen—I never make sweet cream butter, the market demands an acid cream butter. I have heard, however, that it has to be churned at a lower temperature.

Mr. Fuller—Do you get out all the butter at a temperature of 58 degrees?

Mr. Allen—With the Babcock test we are able to find but very little butter fat. I wouldn't think of making butter without a Babcock test.

Mr. Fuller—Will it pay the ordinary farmer to make up his own butter at home?

Mr. Allen—Well, since I have been at this convention a creamery man said to me, that while he was talking against his own interests, that it paid the farmer better to make up his own butter than to take the milk to a factory.

Mr. Michels—We make some difference in the temperature at which we churn as to whether the cream was cool or warm before churning, and how long it stood after being tempered. Do you think that makes any difference?

Mr. Allen—I don't think it would materially, if it was brought to the right temperature when it was churned. I wouldn't want either to cool or to warm it rapidly.

Mr. Grengo—How do you tell when your cream is ripe?

Mr. Allen—By the looks of it; you stir it with a dipper and tell by the looks.

Mr. Hamilton—I have been traveling around among the farmers and I have had a number of the farmers' wives ask me about churning in the fall; after the cows have been milked four or five or six months, they are bothered with the butter coming. I always tell them that the first thing to use is a good thermometer. Since that I have heard it said that the cream should be heated as high as 70 degrees and then cooled back to 62 degrees before churning, and I have known of that being done where it worked very well.

Mr. Allen—The difficulty in such cases is generally that the cream is not at a right temperature.

Question—What per cent. of butter fat do you find in your skim milk with your method?

Mr. Allen—I haven't figured that out with a pencil. I can trace it with the eye simply. It's so very light that I do not stop to compute it.

Mr. Zar—How often do you test your skim milk?

Mr. Allen—Two or three times in the month. Of course, it varies somewhat.

Mr. Zar—I have found as high as eight-tenths of one per cent. butter fat in my skim milk.

Mr. Allen—I have myself when I used the deep setting.

A Lady—Suppose your cream was all right in temperature and circumstances compelled you to leave it, would you lose in butter fat if you warmed it again?

The Chairman—You would undoubtedly lose in the quality of the butter; I don't know about the quantity.

Mr. Zar—Would you advise dairymen who have ten or more cows to use a $25 outfit to raise their cream?

Mr. Allen—No, I wouldn't. I would advise using a Baby separator, because you can make your butter with less labor and get more cream.

A Lady—Do you ever allow ice to come in contact with your cream?

Mr. Allen—No.

The Lady—At many creameries they throw a chunk of ice in the vat, but I have objected to it.

Question—How do you know how much salt to use in the butter while it is in the churn?

Mr. Allen—Unless you grind the salt into the butter and into the grain, in my opinion it won't retain only just about sufficient amount of salt.

Mr. F. D. Curtis—That question is less understood probably than any other thing about making butter. You wash your butter and let it drain. Now, the quantity of salt required there is a matter of judgment. They say now an ounce to the pound, or something like that, but it is no rule to go by, where butter is made in this manner and salted in the churn. I don't care how much salt I put in. If I don't put in more than will dissolve, it will do no harm. I put in two, even three, ounces to the pound in some cases. It depends upon the amount that you dissolve. When you churn your cream at a proper temperature, or rather a little colder than proper, your granules will be very fine, and the butter will hold more water. The granules are like wheat kernels. You let it stand all night, if you please, and in the morning there won't be dripping water, if the temperature is right in the room. Now, you may put two ounces of salt to the pound and revolve it and let it dissolve; revolve it until you work it into the mass. About twelve per cent. of water is permissible in a first class article of butter, so that about one pound remains in it when you have sixteen pounds of butter made, and you will draw out about three pints and that three pints have got to be salted the same as what is left in, so you have to allow for that. It is a matter of judgment and study.

Mr. Smith—If you handle your butter in that way, can you get it into a solid compact mass, so this extra brine will run off?

Mr. Curtis—If you work in an ordinary degree of temperature; if you work in a cold room, your butter will get too cold, and it will be crumbly. I pack direct from the churn and don't use a worker at all. Perhaps, if I had thirty or forty pounds, it would be different. I want to speak about the churnability of the cream and the amount of butter left in. A few days ago my churning was done' I saw it had been churned too warm and I finished packing the butter, and I knew there ought to be about twenty pounds there and there was only sixteen. Then I tested it, and I found that the buttermilk tested five or six per cent. Then I churned that buttermilk and I got three pounds and ten ounces of butter out of the buttermilk. You will find it pays to keep the thermometer right by you and you had better know that your thermometer is right. I have a first class thermometer and barometer, and the glass one I use in churning is simply a little twenty-five cent one, that I break occasionally, but I keep them tested by my other thermometer and know that they are right.

Mr. D. W. Curtis—Do you think all cream ought to be churned at the same temperature?

Mr. F. C. Curtis—I have experience with about thirty Jersey cows and I know how to handle them. My neighbors follow my rules and get about the same results.

Mr. Zar—Do you work your butter in the churn with the ladle?

Mr. Curtis—Not at all. I can give it five minutes to five hours for the salt to dissolve, providing the temperature is about right. In a hurry I wouldn't even stop to let it dissolve. The salt I use dissolves quickly.

Mr. Zar—You don't revolve the churn until it is all in one mass.

Mr. Curtis—I revolve the churn to get it into a mass, and never take it out of the churn until it is in the mass.

Mr. Zar—What salt do you use?

Mr. Curtis—Oh, I don't want to advertise anybody's salt. good American salt every time.

Mr. Zar—When you revolve your churn, do you give it a quick motion?

Mr. Curtis—No, very slow. If your salt is dissolved, you may pank it as hard as you please.

Mr. Grengo—This question of churning depends somewhat on the breed of cattle. Jerseys have larger fat globules in their milk and can be churned at 62 degrees, but Holstein milk is different; Smith, Powell & Lamb churn at about 58 degrees.

Mr. Allen—Mr. Curtis, taking it for granted that the cream is of the right acidity, in which way would be the greater loss, in having the cream warm over 62, or under 62?

Mr. Curtis—Oh, the loss would be by having it over 62. Under 62 would simply make it a longer time to churn.

Mr. Robinson—Does it make any difference of what material your churn is composed, whether pine or hard wood?

Mr. Curtis—Oh, I think not.

Mr. Hamilton—Is it necessary to have a revolving churn, and if so, what kind?

Mr. Curtis—It is necessary; I have used a rectangular churn for about twenty or twenty-five years. I had it inflicted on me as a premium way back, and I have stuck to it ever since, but you will find the common barrel churn, ending over end, to be a good thing. I have no use for inside machinery; it makes more work to wash it and I don't see any use of it. We don't want any grinding action on the cream. In the first use of this rectangular churn I found I put too much cream in. If you put it half full, or less, you will churn as quick as you ought to, if your cream is of the right temperature.

Mr. Robinson—How do you warm your cream up when you find it is too cold?

Mr. Curtis—There are a great many devices for that purpose that cost money, and I have kept myself down to a low expense in everything. I put a pail of water on the stove, put my cream into a tin pail and set it in that hot water, and stir it so that it heats evenly.

Mr. Adams—Is there any objection to pouring hot water into the cream?

Mr. Curtis—You know if there is no one there to watch you, you can do as you are a mind to.

A Member—I would like to have Mr. Farnum state what profit he has made by using a separator.

Mr. Farnum—I have received from eight to twelve pounds a week more from eleven cows than I did by the other system.

A Lady—How many times do you wash your butter?

Mr. Curtis—I used to wash it as Mr. Allen states, but I find that if you churn regularly, as I have stated, and the cream is of the proper acidity, that one water is sufficient for all purposes. Your second water may come out very pale if you put it in, and I think it does injure the flavor of the butter to wash twice. I put in about a pailful of water in twenty pounds of butter, after drawing off the buttermilk and letting it drain pretty well first.

A Lady—There are a good many farmers that think they make good butter, but they don't know where to sell it except to grocers. What can you tell us about that?

Mr. Curtis—They will do well to communicate with the commission men and they will learn if their butter isn't right, what is the matter with it, and that will help educate them. There are plenty of good commission men; you will find probably reliable ones advertising in Hoard's Dairyman. They don't design to allow commission men to advertise in their paper who are not responsible. If you will apply to them they will send you tags, and you can just tack a tag right onto your tub, and if you are near an express office, about this distance from Chicago or Milwaukee, to Milwaukee the freight is about thirty cents for thirty-five pounds or less. To Chicago it is 30 cents for thirty-five pounds or less, delivered to any family or commission man. The commission man will return you a check that any of your stores will cash at its face.

The Lady—How much will the commission merchant deduct for shrinkage on a sixty-pound tub of well packed butter?

Mr. Allen—They vary, they run all the way from one to five pounds. That is why I like private customers best. I think many times they deduct more than they ought to; they have the advantage of you.

A Lady—Is it necessary that the water you use to wash the butter be of the same temperature as the cream?

Mr. Allen—Oh, no, I should say just as it comes from the well ordinarily.

Mr. Fuller—I think I can give the lady a little information in regard to the shrinkage on butter. I have spent a good deal of time loafing around commission houses in Chicago and New York. When you see a tub of butter that is nicely packed to the top, it won't show much shrinkage, but if it is uneven and lumpy on top, the commission man scrapes it off to make it smooth and even, and of course you lose that. A tub of butter weighing fifty pounds will shrink a pound in a few days.

Mr. Allen—There are a good many who would like to work up their product at home but they think they must have a butter room. I will ask Mr. Curtis if he has got a special butter room. I have not.

Mr. Curtis—Neither have I. I don't make it in the parlor nor the stable, but sometimes in the intermediate room, ordinarily in the kitchen in the winter time, and in the summer in the cellar.

The committee on resolutions made the following report, which was adopted:

RESOLUTIONS

Adopted by the Wisconsin Dairymen's Association at New London, February 15th, 1895.

Resolved, That the thanks of the non-resident members of this association in attendance at this meeting are due to the good people of New London for the cordiality of the reception given them and the magnificent arrangements made for their entertainment. We congratulate New London upon its commodious and elegant Auditorium and its new and most excellent hotel.

Resolved, That we shall remember for many years and with the liveliest satisfaction, the superb banquet tendered the association by the ladies of New London, as it was all that such a function should be.

Resolved, That the cordial thanks of this association are hereby extended to the Chicago & Northwestern railroad and its allied lines, the Chicago, Milwaukee & St. Paul railroad, the Wisconsin Central railroad, the Illinois Central railroad and the Green Bay, Winona & St. Paul railroad, for their courtesy in granting reduced rates to persons attending this convention without imposing the customary restrictions as to number of tickets sold, thus recognizing the value of the public service rendered by this association, which is beneficial not alone to the dairymen of the state, but through them to all branches of industry.

Resolved, That we reaffirm our commendation of the National Dairy Congress which is a representative body composed of delegates from the different State Dairy Associations, and we request the executive committee of this association to appoint delegates to attend the coming session of the congress.

Resolved, That this association congratulates the National Dairy Union upon the selection of W. D. Hoard as its president. We regard the work of the Dairy Union as of the greatest importance to the dairy interests, to the general farming interests of the nation and to all consumers of food. The war against fraudulent food products must be a national as well as a state contest. The honest producing interests of the country have a right to demand all that congress can give in the way of protection against counterfeits and frauds. Unorganized sentiment, however strong, is not effective in the halls of legislation. This association is a unit in asking the business-men, the farmers and dairymen of Wisconsin to aid President Hoard and the Dairy Union by every legitimate means in bringing sharply before congress the necessity of the most stringent laws for the limitation or prohibition of the business of selling counterfeit food products. When almost every article of food is adulterated, when chemistry and greed unite to rob the people of their money and their health, when the pressure of even honest competition bears hard enough upon every legitimate industry, when the supreme court of the United States has said that no man can claim the right to perpetrate a fraud, it becomes the duty of the people to ask congress

to give the aid of the federal government in giving pure food products the American market.

Resolved, That the manufacture and sale of filled cheese, oleomargarine and similar compounds under whatever names or other disguises they may assume in their efforts to palm themselves off for what they are not, is threatening the life of the dairy industry in Wisconsin and has already seriously impaired our reputation in this country and abroad. Every citizen of the state is vitally interested in this matter. The profits of the filled cheese and oleo business go mainly to a few manufacturers and middle-men These profits constitute a bonus given to destroy the previous splendid dairy reputation of the state and to break down an industry which has benefited all classes of our people. The members of this association not only as individuals but also as representatives of the 100,000 dairy farmers of the state, respectfully demand therefore of the legislature of Wisconsin, the enactment of a law which shall effectually protect them from fraudulent and unjust competition and shall secure to the consumer, who is in every instance the final purchaser, pure and unadulterated dairy products, when he wants them, and to this end, being persuaded that Senate Bill No. 143 or Assembly Bill No. 80 would accomplish these purposes, we respectfully ask for their early and favorable consideration by the people's representatives now in session at the state capital.

Resolved, That experience has amply demonstrated that the system of cheese instruction adopted by this association has been productive of great good and should not only be continued but increased both in amount and efficiency. In this respect we may very profitably follow the example of our most formidable competitor, the Dominion of Canada, and that this may be done it is important that the appropriations heretofore made to this association be continued and put in such form that we may know in advance what means may be at our disposal for this purpose.

The above resolutions were reported to the convention by George W. Burchard and H. C. Adams acting as a committee upon resolutions, and were unanimously adopted.

The following resolutions were introduced by Mr. Burchard and received the unanimous approval of the convention.

Resolved, That the hearty thanks of this association are hereby extended to His Excellency, Governor Wiliam H. Upham, for the emphatic and uncompromising stand taken by him in regard to fraudulent imitations of dairy products in his annual message to the legislature, and that we accept the subsequent appointment of Hon. H. C. Adams, an honored ex-president of this society, as dairy and food commissioner of Wisconsin, as an assurance that the dairymen of the state may expect a vigorous and impartial execution of all laws looking to the protection and preservation of Wisconsin's dairy interests.

Resolved, That we extend to Mr Adams our most sincere congratulations upon his appointment and pledge to him our individual and collective co-operation in banishing from Wisconsin every vestige of complicity in the manufacture or sale of fraudulent food products.

The committee on nominations reported the following gentlemen as nominees for the various offices:

President, C. H. Everett, Beloit.

Secretary, D. W. Curtis, Ft. Atkinson.

Treasurer, H. K. Loomis, Sheboygan Falls.

On the motion to adopt put by Mr. De Land, the vote was unanimously in favor, and the gentlemen named were declared the duly elected officers of the association.

President Everett—In behalf of your officers I desire to thank you. Mr. Curtis and Mr. Loomis have served you for many years faithfully and you have cause to re-elect them. I assure you that I am not indifferent to this compliment, and my mistrust of myself in again accepting this office is mitigated by the thought that I believe every member of this association will stand by its officers for the betterment of the dairy industry in Wisconsin. I thank you.

The committee on dairy utensils, through its chairman, Mr. Noyes, reported as follows:

We find that there is on exhibition the following:

F. B. Fargo & Co., Lake Mills, Wis.—A Pemering heater for tempering milk for separators; Fargo's cheese and butter color; Rennet extract; Farmers' Babcock milk test; Factory Babcock milk test; Steam turbine Babcock milk test; Fargo's combined churn and butter worker No. 5.

Robert Wittke, Brillion, Wis.—Rotunda tread wheel for running hand separators, churn and pump, etc.

Davis & Rankin Manufacturing Co., Chicago, Ill.—One hand separator.

Creamery Package Manufacturing Co., Chicago, Ill.—The Belknap butter package; two bottle milk test for farmers; Hansen's rennet extract; Hansen's cheese and butter color; Hansen's Columbian rennet extract; Feverine cure for milk fever; Gargetine for cows.

Vacuum pan dairy salt exhibited by R. M. Boyd, Racine, Wis.

A. J. Decker & Co., Fond du Lac, Wis.—Babcock milk test for factory and farm; milk thief; 20 gal. milk can; No. 5 U. S. hand separator.

Respectfully submitted,

Chester Hazen.
C. H. Taylor.
H. J. Noyes.

Committee on dairy products, reported as follows:

FANCY MADE CHEESE.

Prof. T. L. Haecker, of the Minnesota experiment station, made a fine display of fancy cheese, demonstrating beyond a doubt that this class of cheese can be made in this country successfully.

His make of Gouda cheese he recommends for farmers living remote from any factory. These cheese had all the appearance

of foreign made cheese, and he very generously donated the exhibit to members of the association who had a taste for this kind of cheese.

CLASS 1.—DAIRY BUTTER, PRIZE $50.00.

J. D. Grandine, Sherwood	96.6
R. Crossfield, Oakland	93.6
F. C. Curtis, Rocky Run	91.
E. Farman, Stephensville	88.3
Wm. Sweeney, Fox Lake	82.
Chas. Thorpe, Burnett Junction	81.6
A. C. Miller, Stephensville	80.
Jno. Matz, Sugar Bush	77.6
C. R. Smith, Zion	71.
A. M. Hutchinson, New London	70.
Geo. Lindsay, Manawa	67.6
Mrs. N E. Allen, Beaver Dam	89.3

CLASS 2.—CREAMERY BUTTER, PRIZE $50.00.

W. H. Chapman, Oakfield	96.3
Mrs. E. C. Farrington, Rocky Run	89.3
M. Michels, Calumetville	88.
Jos. Williams, Stearns	85.6
R. M. Bussard, Black Earth	83.6
C. R. Allen, Allensville	82.6
H. J. Noyes, Richland City	79.3
E. L. Eastman, Saukville	79.

CLASS 3.—PRINT BUTTER. FIRST, $5.00; SECOND, $3.00; THIRD, $1.50.

J. D. Grandine, Sherwood	92.3
Geo. Lindsay, Manawa	91.
Mrs. N. E. Allen, Beaver Dam	89.3
A. M. Hutchins, New London	79.6
W. R. Johnson, Appleton	78.3
C. R. Smith, Zion	76.6
A. Cuff, New London	72.
C. H. Allen, New London	71.3
Miss Dorothy Granger, Bear Creek	70.6
Jno. Matz, Sugar Creek	67.6

CLASS 4.—CHEESE, CHEDDARS, FLATS, YOUNG AMERICAS, SWISS OR BRICK. PRIZE $50.00.

W. M Zwicky, Van Dyne	93.3
N. Simon, Neenah	90.6
Chas. Paul, Neenah	90.6
A. Cuff, New London	90.3
A. L. Murphy, Hortonville	88.3
H. J. Noyes, Richland City	87.
E. A. Heubner, New London	87.
C. Shamrock, New London	85.3
C. J. Bretruck, South Osborne	84.6
B. Nelson, Dale	84.6
Minnesota Dairy School	84.
M. Kramer, Chilton	84.
C. A. Johnson, New London	77.3
F. M. McKinney, Kirkwood	77.
C. L. Jones, Basswood	75.
E. Kolb, Maytown	72.

CLASS 5.—CHEESE. SPECIAL. SILVER CUP, VALUED AT $100.

H. J. Noyes, Richland City	96.
Chas. Paul, Neenah	94.3
N. Simon, Neenah	94.3
Chas. Cornwall, Richland Center	92.
Wm. Zwicky, Van Dyne	91.3
Chas. Shamrock, New London	84.3
F. M. McKinney, Kirkwood	83.3

Both reports were adopted.

THE RECORD OF OUR COWS FOR '94.

A. G. Cate, Amherst Junction, Wis.

My first thought upon being requested to present the record of our cows for '94 was of the brown and sere pastures of the past summer, of how far short of our anticipations their product had fallen, and that it might be easier to record their sins of omission. However, after an hour's work at my books I

found that they brought us in the sum of $96 per cow, and decided that under the very trying circumstances the Jerseys had done pretty well, a characteristic trick of theirs, and arose from my chair with a greater respect than ever for the little animal who pays you double for all you give her. For the benefit of the faint-hearted dairymen who are selling off their cows and impoverishing their land thereby, I will relate the facts in regard to how I managed to keep up a fair flow of milk in spite of the unfavorable season. Let me state here that I run the dairy and do most of the farm work with the help of one man. We frequently have as many as forty-five head of cattle, counting in the young things. In order to do this work easily, have found it necessary to arrange and rearrange our barn until now we consider it quite a model for comfort and convenience.

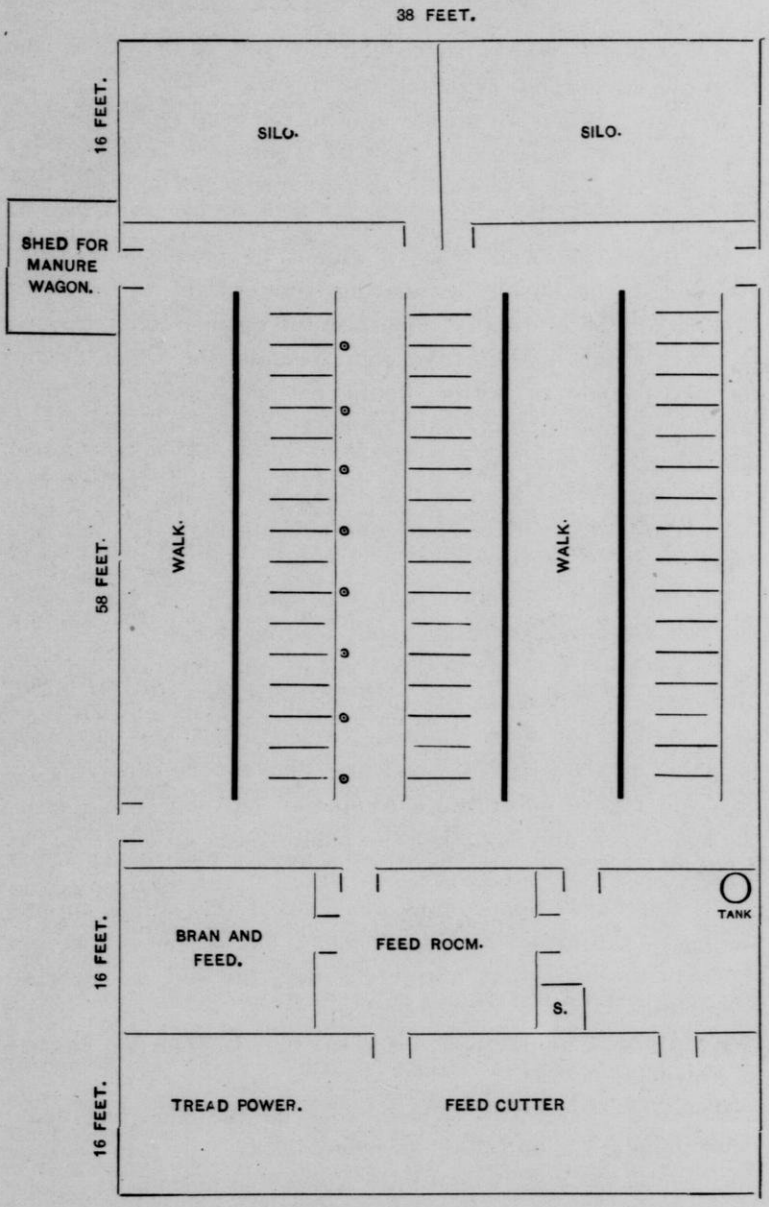
One of the first things I learned upon returning to the farm five years ago was, that if I wished to make a success of dairying in this section I must follow Gov. Hoard's advice and practice soiling, which I have done and consider it the salvation of the dairymen in our section of the state, where in four years out of five you can count on a drouth of from six to twelve weeks' duration every summer. Nor is that the only hardship to overcome. Jack Frost generally appears early each fall with a sharp appetite for a good bite of our fodder, which must also be taken into consideration. In the spring we sow peas and oats as soon as the land can be worked, sowing two bushels of oats to one bushel of peas, using the Canada field pea, putting them in with a shoe press drill, and by the time they are fit to feed the pastures have begun to fail. I fed each night in the mangers as much as the cows would eat up clean. Following these I fed sweet corn, and by this time the drouth was upon us in full blast, and to keep up the flow of milk I was obliged to feed this twice a day. Also feed this in the barn to prevent waste, and as it was small did not run it through the feed cutter as I otherwise would have done. In connection with this feed I gave each cow two pounds of wheat bran per day.

Our cows were stabled each night all summer, with the exception of a few nights when there was no breeze and the atmosphere of the barn was oppressive. When the cows were

put up for good this fall I commenced feeding the following ration: 4 pounds wheat bran, 4 pounds wheat middlings, 2 pounds oil meal, 1-2 pound oats and 2 baskets of unhusked corn fodder, cut into 1-2 inch lengths, and when the corn was gone I added 2 pounds of corn meal and 4 pounds of potatoes to the above ration, and for roughage rye straw, which my cows prefer to oat, a fact which I find is not readily accepted by many, but one that I am duly thankful for, as we can count on a crop of fine winter rye as a sure thing. From the beginning of the year until the 21st day of April, when we turned the cows out to pasture their ration consisted of 15 pounds of clover hay in place of the corn meal, and potatoes were only fed three times per week. During the year '94 we milked 23 cows,—3 2-year-olds, 3 3-year-olds and 17 old cows. We do not make butter to any extent but market our cream and some milk, shipping to dining companies, ice cream firms and city milkmen, on the cars every morning, a small amount finding a market near at home. We have never tested our cream with the Babcock test. We have always understood it was quite impossible to get a correct reading. By the churn each gallon yields two pounds and at some seasons of the year more. Selling as we do in large and small quantities our prices vary some, from 50 to 60 cents for cream and from 3 1-2 to 5 cents per quart for our milk and the greater portion of it goes for 4 cents per quart. We use every precaution to keep obnoxious bacteria out of our milk and have succeeded so far as to be able to ship cream and milk to Ashland, Wis., which is nearly 200 miles north of us, in a common express car, without loss. Our stables are cleaned, swept and liberally sprinkled with land plaster, and the manure hauled to the field and spread daily. The cows are brushed and carded every day after they are put up for the winter, and as we do not make a practice of letting them out in the winter, I think it quite necessary that they receive a good cleaning every day. We use the Buckley watering device which gives perfect satisfaction, though I had to make wooden covers for the buckets as the cows would play in the water, throwing it into the manger with their tongues. These covers they can lift with their noses when they wish to drink. The

stable floor is laid according to a plan furnished in one of the Bulletins by Prof. Henry, with gutters and a rack made of 2x4 for their hind feet. These racks are made in sections and are fastened to the planks in front with hinges. As our barn is high between ceilings I left an air space of six inches between the old and new floor. The cows are fastened in stanchions facing each other with an alley for feeding between the mangers 4 1-2 feet wide, at one end of which is the feed room, at the other the silos. Seven full size windows light the barn, which is ventilated by shafts running to the second story, there being a ventilator on the roof. On the west end of the barn next to the feed room is the tank room that contains the water tank that supplies the cows with water. The separator is also in this room. Just outside on the west end of the barn is a lean-to 16x38, in which are placed the tread power and feed cutter. The tread power is a two-horse power, but runs so easily that we use a small pony in it when running the separator. We commence milking the year around at 5 o'clock in the morning and at 5:30 o'clock in the evening. Both at night and in the morning the cows are fed their grain ration before milking.

In estimating the returns from our cows I have not included the calves. I did not purchase a separator until October 1, 1894. Otherwise I would have been able to have reported a higher average. Previous to that time had raised the cream by the deep setting process. I find that our cows consumed $44 worth of food. Estimating that 25 per cent. of this is returned to us in manure, the cost of keeping was thereby reduced to $33, leaving a net profit of $63 per cow.


38 FEET.
16 FEET.
SILO.
SILO.
SHED FOR MANURE WAGON.
58 FEET.
WALK.
WALK.
16 FEET.
BRAN AND FEED.
FEED ROOM.
TANK
S.
16 FEET.
TREAD POWER.
FEED CUTTER

DISCUSSION.

Mr. Adams—What percentage do you skim when you skim for the purpose of selling the cream?

Mr. Cate—When we set our milk in the deep setting process sixteen quarts of our milk gave us a gallon of cream on the average. I set my separator so that I will get the same heft of cream. It skims entirely clean.

Mr. Burchard—And from a gallon of cream you churn two pounds of butter, estimating your cream to be about such cream as is usually furnished for commercial purposes, it would weigh not far from eight pounds, the whole cream, the two pounds of butter would be one quarter of that. making the fat in the cream probably twenty to twenty-two and a half per cent. of fat.

Question—What kind of fastenings have you?

Mr. Cate—The old fashioned stanchions that they all condemn.

Mr. Burchard—I notice that you spoke of having a silo, but you don't say anything about feeding silage?

Mr. Cate—I have always fed silage till 1894. I did not fill it this year because the corn did not get big enough. I have used it for four winters. I have had one customer for going on six years, the customer that we are supplying today, and I have never had a complaint, only once in a while the boys write and say, "Let the pump freeze up one trip," as a joke.

Mr. Burchard—Some of us have heard that silage injures the milk, the cream and the butter, but whenever we get down to the man that absolutely uses the silo, we hear no complaint.

Mr. Allen—I understood you to say that you fed two bushels of cut corn.

Mr. Cate—Yes, that includes corn on the cob, and while I fed that I did not feed any corn meal. In fair seasons the corn on the stalk would husk a hundred bushels, the same corn we put into our silos.

The Chairman—We have to take into consideration that

Mr. Cate is dealing with a cow that can take care of much more corn than an ordinary cow.

Mr. Arnold—At the present high price of bran and the low price of corn, isn't it a good thing to feed a little more corn than you would ordinarily?

Mr. Cate—I feed corn, because I think when I haven't got the silage and haven't got the fodder with corn in it I need to feed the corn to help the color out. It gives the cream a body, it adds to the richness of it, makes a better looking article.

The Chairman—It is a good point to feed as much of this carbonaceous food as the cow will stand because it is the cheapest food on the farm.

Mr. Grengo—I understood Mr. Cate to say that he drew his manure from the stable each day. Don't you think you lose a great deal that way?

Mr. Cate—I don't think that the loss that you meet in hauling manure to the field and spreading at that time will off-set the extra loss that you have in putting the manure in piles and spreading it in the spring when you have to hire men to do it.

Mr. Grengo—Isn't it profitable to let the manure remain in the yard and let the hogs run there?

Mr. Cate—I am not a hog man, perhaps that might be so.

Mr. Grengo—We made an experiment at Madison in feeding whole corn and we found there was no more loss in feeding it whole than ground corn, where the hogs were allowed to pick over manure.

Mr. Arnold—How much butter will the poorest cow make and how much the best cow?

Mr. Cate—My cows average 355 pounds of butter a year, and I haven't a cow in the herd that tests under four per cent. Of course they vary. I have cows that have tested as high as eleven per cent., and some seven and eight. The way I feed, the poorest cow I have got will make a pound of butter a day, if it was all put into butter. Of course, there is our own home use, besides what we sell, that must be accounted for.

Question—Do you mean 365 pounds of butter a year, or a pound a day?

Mr. Cate—During the milking period of the cow.

Mr. Arnold—Can you tell us the average tests of your herd per year?

Mr. Cate—I think it is somethng over five, and something over six thousand pounds of milk.

Question—How long do you let your cows go dry?

Mr. Cate—I have some cows that I cannot dry, what we call persistent milkers. I have some that will go dry a month and some not so long, some six weeks. Of course, the persistent milker is the most profitable, because I can count so much on her every day in the year.

The Chairman—Can you use that milk right along?

Mr. Cate—I can use it up to within three weeks. I think the cow that goes dry a month will repay better when she comes in than a cow that milks right up.

Mr. Zar—Do you consider it safe to dry a cow when she milks right up to four weeks before coming in?

Mr. Cate—You must know your cows. After a man has had a herd of cows some time, he knows pretty near what his cows will stand. The minute a cow commences to dry up, you must let her dry up.

Mr. Adams—I find in my experience that the persistent milker is a kind of a humbug. I have read about them but I never saw the cows.

Mr. Cate—Wouldn't you call a cow that would milk up to within a month of dropping her calf pretty near a persistent milker?

Mr. Adams—Oh, no, I have had cows that milked 365 days in the year, and would have milked another day, if there had been another day, but I think it is always a misfortune to an animal to go dry less than a month.

Mr. Cate—I think you are right. I never had any that milked every day.

A Member—Isn't your feed pretty heavy, and do you find that that kind of feed which is what we might call high pressure, wears the cow out pretty quick?

Mr. Cate—I have got the cows I started in with six years ago except a few we have turned off, and I don't see but they are just as bright as they were the day I commenced. I

know they look better and they give the same quantity of milk. As to being a high pressure of feed, I think a good many men that I read about feed higher than I do.

Mr. Grengo—It is a popular notion among farmers that if you feed cows up pretty high, you are going to ruin them, that is, if you give them enough to eat you spoil them.

Mr. Cate—My cows have been fed that way and been stabled every winter; sometimes I put them up the 17th of October and feed them that way till the 25th of May, and they never have been out doors, and I never have had a cow yet after she has passed the period of coming in fresh would refuse a meal.

Mr. Arnold—How do you treat them when they have their calves so that they take their feed all right?

Mr. Cate—I treat them as I would a lady, you might say, but I feed potatoes and oats to my cows to help them along, and after they drop their calves, I don't feed again for two weeks; that is, I don't feed up to her regular ration for twelve days. If she does well in twelve days I commence and feed her right along.

A Lady—Do you allow her calf to remain with her?

Mr. Cate—Some cows I do and some I don't. You must know your cow. A cow that is nervous and excitable and seems to think more of her calf than another, I let that calf stay; sometimes I let the calf suck the cow and sometimes I don't. The most trouble I have ever had in raising a calf is one that I have let suck two or three days.

The Chairman—I want to say a word in regard to the handling and management of the heifer when she first becomes a cow. In my experience I have found that it is a bad plan to let the calf suck its mother, particularly if she is a heifer. It is better to place the calf at the heifer's head where she can lick it and at the same time milk the heifer yourself, and in that way she becomes educated to give the milk down to you instead of the calf and there is really no distinction between the two calves.

A Lady—After the calf has remained with the mother several days, would you remove it entirely out of her sight? Sometimes my man takes the calf away from the cow after

dark at night, but sometimes the calf is left where the cow can see it.

Mr. Adams—I think that the less the calf knows the more intelligent it is. The quicker you get it away from the cow the better the calf is off and the better you are off.

Mr. Brigham—When you take the calf away when it is first born, how often do you feed it for the first few days?

Mr. Cate—If we are there and the cow is all right, we take the calf right away and we sit right down and milk the cow. If she will drink that milk I give it to her, then we take some of the milk and give it to the calf. Then after that we milk the cow seven or eight times a day and we feed the calf a good many times a day. The first two weeks of the calf's life, if it is a calf I wish to raise for a cow, I feed it whole milk, and then I give it half milk, and then I use oil cake after it is two weeks old.

Mr. Robinson—Are your calves dropped in the field or do you have a room?

Mr. Cate—We try to know when the time comes and have our cows out of the stanchions two weeks before.

The Chairman—Is any one present using the Bidwell stall?

Mr. Durham—I have used it and like it very well.

A Lady—I think those rigid stanchions are very cruel. I don't see how any dairyman can use them.

Mr. Durham—I have had some of the best dairymen in Wisconsin come to our barn and I put the question direct to them, "Would you use the Bidwell stall after seeing how comfortable my cattle are?" and they have said, "No, I would not go to the expense. My stalls are bedded every day."

Mr. Meyers—I have got twenty-seven stalls; they are very cheap. When the cow wants to lie down she has got to step forward. You can keep that full of bedding and there is very little waste, and it keeps the cow almost perfectly clean.

Mr. Allen—I have used the Bidwell stall for two years. I tried most everything else, then I tried that. The horns on the cows bothered me, and I took them off and it is all right. My cows do better work this winter than ever before. I have got all ages of cows, and the platforms are all of one length. Before I had the Bidwell stall, I could not keep my cows of

different sizes clean, and I want my stable clean. More than that my cows would kick each other some times, and now I can keep every cow separate, and that is very important in winter dairying.

Mr. Allen—I have heard that some times cows have attempted to jump out of the stables with these stalls.

The Chairman—I never had any such experience, but the trouble could be easily obviated by hanging bars between them.

Mr. Arnold—I have had some experience in that line, but as every dairyman knows who is in his barn much, it happens when a cow is in heat, you want to watch a little and put a chain around her neck.

Mr. Barnes—I have seen cows tied in all kinds of ties, and confined in all kinds of stanchions, and I want to say that I never saw a row of bovines that looked so happy and comfortable and contented as Mr. Cate's in his rigid stanchions, and I believe that if the rigid stanchions are properly built with good smooth material, so arranged that the cows do not slip, with plenty of room for them to move around, that they are all right.

Mr. Grengo—At the state and county fair I had cows tied by the heads, and I had one heifer that was very nervous, and wouldn't stand still when she was in the stanchion; while she was tied up by her head she would look at me and low and lay her head on my knee, and I never saw a cow stand quieter than she did. I think I shall put in the Bidwell stall so as to get better acquainted with my cows, and I believe they will give down their milk better.

Mr. Barnes—I should be very crowded in the Bidwell stall. There is no room for me to swing a milk stool in.

A Member—Do you tie in a continuous row?

Mr. Cate—Our cow barn is probably 58 by 38 feet. There are twenty-eight cows, tail to tail and twenty-eight cows head to head, three rows altogether. The milkers I have in the row facing each other, fourteen in each row. There are no partitions in the barn at all.

A Member—Do they ever dance a jig on each other's udders?

Mr. Cate—I have had cows hurt themselves.

The Chairman—That would not occur with the Bidwell stall. Convention adjourned until 2 o'clock p. m.

Convention met pursuant to adjournment at 2 p. m. The president in the chair.

THE BETTER PROFIT OF LIBERAL FEEDING.

Charles Meyers, Kewaunee, Wis.

I have tried both ways, poor feeding and good feeding, and will try to show how I have been enabled to get some of the better profits of good feeding.

Eight years ago I attended the first farmers' institute held in Kewaunee and listened for two days to such men as Prof. Henry, Gov. Hoard, S. Faville and the late Hiram Smith. Their talk inspired me with the idea of becoming a dairyman. At that time farmers in Kewaunee county made a living out of wood and wheat, and as long as the cows managed to keep alive we considered that they made their living. In summer they ran in pastures and in winter they had to get their living out of a straw stack and most of the farmers are giving their cows the same feed and care at the present time, and the records at the neighboring cheese factory show that they earn their owners on an average about $22 for the season.

Now, there is no profit in that kind of feeding and there is no one that knows it as well as the farmers that try to make an existence that way. When I started into dairying I kept on buying cows until I had twenty-two. They were poor cows and after summer butter making with them for about two years I was going to give up the business for I could see no profit in it, but I finally concluded to invest another dollar and send that as a year's subscription to Hoard's Dairyman. After reading the Dairyman for a short time I learned among other things that I was a very poor feeder.

The question with me at that time was how to get a profit

out of those cows. I changed them around so as to have them fresh in the fall and then began a better system of feeding and as soon as the Babcock tester came upon the market I bought one and then I got a profit out of my cows. But in order to get that profit I had to sell two-thirds of them to the butcher, and that is the only way to get a profit out of about two-thirds of the common cows. Give them a chance by good feeding, use the Babcock tester, find out what each one is good for. If it is butter all right. If it is beef the sooner you sell her to the butcher the better

About four years ago I learned the great value of pea meal from one of Prof. Henry's feeding tables, and have been using it ever since and have always got a good profit out of my cows.

At the present time I am milking twenty-two cows and feed them 220 pounds of pea meal and wheat bran each day. That costs me $1.50 and I charge them $1.50 for the roughage they eat which consists of hay made from peas and oats, meadow hay and pea vines, so it costs me $3 a day to feed my cows. At the present time they are making 24 pounds of butter a day, which sells on the Chicago market for 23 cents per pound, which leaves me just about $5 a day after deducting freight, cartage and commission, or a profit of $2 a day. Not a very big profit indeed, but in these days of close competition, panics and hard times, filled cheese and oleomargarine masquerading all over the country the dairy farmer must work for low wages.

Now if I should go to work and feed only 110 pounds of pea meal and bran a day and try to save 75 cents a day how much would I make by it? I would lose on quantity and quality of butter alone enough so as to wipe out all profits whatever, for it is the last 110 pounds that brings the profits. Some farmers say feed your cows only what you raise on the farm. Well, on account of the drought last summer I raised just about feed enough to keep all my stock alive during the winter, but by using about $400 worth of peas and beans I can sell my own fodder through the cow at a good market price and make profits enough besides to keep the wolf from the door.

In summing up the better profits of good feeding we must not only take into consideration the dollars that we get out of butter. Butter is what we have constantly got the eye on and try to increase the quantity and improve the quality. But let me point out a few of the by products. The butter dairyman that is a good feeder can sell at least one hog each year for each cow that he keeps and no farmer can raise pork as cheap or of as good a quality as the dairyman that has got a lot of skim and buttermilk to dispose of. The manure that we haul out upon our farms each day from fall until spring is valuable according to the quality of the feed that we use and I consider it of the greatest importance to Wisconsin farmers to enrich their soil through good feeding.

Good feeding does not consist alone in giving the cows plenty of good feed. With watch in hand you must be punctual in all your work, your heart must be in it. Get enthusiastic and then you will get a combination of pleasure and profit out of your business.

The idea of good feeding is something you can't get through some farmer's heads. Put the good feed before the cow and she will get it through her head all right, and in nine cases out of ten she will return value received and a profit besides, if she was fresh in the fall. But the farmers want the cow to do business on the credit system, and she can't do it.

What is it that these farmers that feed their cows so poor are mostly in need of? I have been there only a few years ago and I ought to know. They need a well balanced ration to feed their own brains on. They say that fish is a brain food, but neither fish nor fish stories would help them. But I have got a sample of the feed right here in my overcoat pocket that will help them. It is a Wisconsin product and all Wisconsin farmers should take it. Here is a ration (exhibing a copy of Hoard's Dairyman) that costs a dollar and it will last for 365 days. It is the best investment I have ever made. It will put an end to starving cows from grass to grass.

DISCUSSION.

The Chairman—I was at a farmers' institute when a man arose and said he could not afford to feed his cows until they gave enough milk to warrant it. Mr. Meyers arose in the audience and gave the statement of his cows. I was immediately impressed with the statement made and the appearance and the energy of Mr. Meyers, and that evening, when I got home, I sat down and wrote an account of the institute to Hoard's Dairyman and told of the good success of Mr. Meyers and he has today presented to this convention one of the very best and most practical papers that we have had during our whole session. He is a very successful dairyman, and got his first inspiration out of a farmers' institute eight years ago. I enquired into his personal history and found out that at that time he was poor and he had a friend who loaned him a little money to start in the dairy business, and the man told me he had faith in the young man and he was not afraid to let him have the money and that he had paid it back long ago. He is before you today and I want you to ask him many questions.

A Member—Give us a statement of your cows.

Mr. Meyers—I would be unable to do that, because I have so many poor cows. I don't test my good cows very often, but there are always half a dozen that I want to get rid of, and when I get rid of them, there will be another half a dozen that I want to get rid of.

Question—You feed bran and pea meal equal parts, do you?

Mr. Meyers—Yes, sir; on the average of ten pounds a day.

Mr. Culbertson—What does pea meal cost?

Mr. Meyers—I buy the peas at forty-five cents a bushel and grind them myself. They are the best crop we can raise in our country.

Mr. Culbertson—How did you change your cows from spring to winter dairying?

Mr. Meyers—Simply by allowing them to run over one year.

Mr. Culbertson—What is the average of your pea crop in your county to the acre?

Mr. Meyers—It depends on the season. I sow two bushels to the acre, a good many sow one and a half. We cut them with a mower with pea guards.

Mr. Culbertson—I wish you would state a little more about that, I am a great believer in peas and can grow them all right, but some times I can't harvest them.

Mr. Meyers—I don't raise peas like most of the farmers do, I sow a mixture of one-third peas and two-thirds oats and I cut it with a reaper. This year I cut most of them into hay on account of the short feed. The peas that we sow alone we cut with a mower and we put on pea guards, and then pitch them with barley forks. The peas that I bought at a low price, were peas that were cracked by the threshing machine. I bought the split peas and ground them myself. What peas I raised I sold for twice what I paid for the others.

Question—How much peas have you when you sow one third peas and two third oats?

Mr. Meyers—Never alike two years. When we have a wet season, the oats will be the better crop; in a dry season, you will have nearly all peas. In an average season you get a monstrous crop. We sow with a seeder, both at the same time.

The Chairman—Do you sow the peas right onto the surface, broadcast, with a feeder?

Mr. Meyers—Yes, but we live in a very moist climate. They grow best on heavy clay.

Question—Where do you get those guards that you use?

Mr. Meyers—You can get them from almost any machinist. My set cost seven dollars. If you have a Champion mower they will fit on that. You simply slip them on and there is a bolt at the rear of the cutting bar. You can cut five or ten acres a day, if you have got help enough. I used to cut them with a scythe, but it was awful hard work.

Question—When you have a mixture of peas and oats how do you keep the peas from shelling out when you cut them?

Mr. Meyers—Then I cut with a reaper, rake it in piles and haul it in, load it up with barley forks. Last summer I in-

tended to thresh them, but the grasshoppers came along and they were going to thresh them for me, and I tried to get ahead of them and cut it into hay.

Question—How ripe are they when you cut them for hay?

Mr. Meyers—You want oats that will mature a little sooner than the peas and then as soon as the oats get a little bit yellow on the top, cut it. Don't sow oats that will ripen too late because your peas will be ripe too soon then.

Question—Do you roll your ground after you have sown?

Mr. Meyers—I roll it, and then I drag it again, because that clay land bakes too hard. I have cut them with a binder, but I have no use for the binder. If you cut them with a reaper, on a nice day in the afternoon, the next day, in the forenoon, turn it over on a nice warm day, and then you can load it with barley forks before night, and the peas won't even heat up.

The Chairman—I cut last year with the binder with very good success.

Mr. Zar—What time do you prefer to have your heifers come in the first time?

Mr. Meyers—About two years old.

The Chairman—When a heifer comes in at the age of twenty-four or twenty-eight months, it is a good idea to milk them for sixteen or eighteen months continuously. I prefer to have heifers fresh in the spring for the first time. It gives me a chance to handle those heifers through the winter beforehand, and to have them get used to me. I frequently sit down by the side of the heifer with the milk stool. I do not handle the udder, but I manage them in such a way that when they are fresh in milk, there will be no trouble in milking. Then another reason for this long period of milking; if she is fresh last spring, I would milk her this summer and all next winter, and up to next July, and when she is again fresh in milk it will be winter, and by that time I have educated that heifer into the habit of what we might call a perpetual milker, and she is a winter cow. You can educate that habit into the heifer just as easily as you can educate her into the habit of giving milk only six months, and then being obliged to feed her the other six at no profit.

Mr. Davis—Is there any objection to handling the heifer's udder, say for two or three weeks?

Mr. Meyers—There have been objections raised by a good many of our dairymen. If she is from a dairy strain and has a high dairy temperament, comes from a dam and a sire that are strong in this dairy element, she might be inclined to start the milk, and of course, that is not desirable. I never would do it unless there was great danger of a caked udder, and there is very little danger of that with a heifer, and that can be obviated many times by rubbing.

Mr. Davis—I have had a cow where the udder was badly caked and by sitting down and working carefully for five minutes once in awhile, it limbered up all right.

THE NECESSITY OF TESTING A DAIRY HERD.

W. F. Stiles, Lake Mills.

After so many valuable papers and dicussions as you have had at this convention it would be strange indeed if I did not mention many points which others have already spoken of. One thing may be said in favor of this, however, that when two persons working independently of each other reach the same results the truth found is doubly valuable.

In this country we are constantly looking forward to and striving after better things. New discoveries are constantly being made and we are ever willing to put them in practice as soon as they have been found successful. The dairymen as a class have never been behind in this line. The cream separators have taken us by storm. In the north, winter dairying may almost be considered the rule and summer dairying the exception. In the southern part of this state creameries have almost driven out the cheese factories.

And now the Babcock test as a discerner between right and wrong is being widely used. Nearly all of our factories use it to determine the value of the milk delivered by the patrons

and now its advocates claim for it a still more thorough line of work. That is the testing of the individual cows in the herd. We should have a fixed standard to which every cow should come before she is accepted in the herd, the same as our public schools have a certain mark that each must pass before being allowed to teach. When dairymen realize that there are some of Pharaoh's lean kine in each herd, eating up the fat kine, they will be anxious to adopt some method of discovering these and disposing of them. The quickest and most reliable method thus far discovered is to test each cow's milk with the scales and Babcock test.

As the value of a man's pocketbook depends upon the value of the coins which it contains so the value of a dairy herd depends upon the merits of the individual cows of which it is composed.

The variation found in the milk of different cows is surprising. The amount of milk seems to have very little relation to the quality. It may be safely said that in the same breed the per cent. of fat has no relation to the quantity of milk given. I have found that some of my heaviest milkers are the best testers. On chart No. 1 will be found the result of a two days' test with ten cows of the home herd.

CHART NO. 1.

No.	Lbs. of Milk.		Test.	Butter	Value.	Cost of Feed.				Profit.
	Nov. 30.	Dec. 1.	Per cent.	Lbs. per Day.	Per Day.	Silage.	Meal.	Clover.	Total.	Cts.
1..	35	36	3.4	1.38	$.345	6.2 Cts.	5.6 Cts.	4 Cts.	15.8 Cts.	18.7
2..	36	36	3.7	1.53	.383	6.2 Cts.	5 6 Cts.	4 Cts.	15.8 Cts.	22.5
3 .	32	31	3.15	1.14	.285	6.2 Cts.	5 6 Cts.	4 Cts.	15.8 Cts.	12.7
4..	31	31	3.55	1.26	.316	6.2 Cts.	5.6 Cts.	4 Cts.	15.8 Cts.	15.8
5..	23	24	3.4	.72	.229	6.2 Cts.	5.6 Cts.	4 Cts.	15 8 Cts.	7.2
6..	23	24	3.9	1.05	.263	6.2 Cts.	5.6 Cts.	4 Cts.	15.8 Cts.	10.5
7..	21	24	3.25	.84	.21	6.2 Cts.	5.6 Cts.	4 Cts.	15.8 Cts.	5.2
8..	20	20	3.90	.89	.224	6.2 Cts.	5.6 Cts.	4 Cts.	15 8 Cts.	6.6
9..	22	23	2.95	.733	.183	6.2 Cts.	5.6 Cts.	4 Cts.	15.8 Cts.	2.5
10 .	18	22	3.9	.89	.224	6.2 Cts.	5.6 Cts.	4 Cts.	15.8 Cts.	6.6

The feeds used when I made this test were ensilage 50 pounds, clover 10 pounds, middlings 9 pounds. I secured the ensilage at $2.50 per ton, the clover at $8 and the middlings at $12.50. The price of butter was 25 cents.

These calculations were based on the price of feed and butter for 1894 and thus the results would not be the same for this year. But they show the difference between the cows. If I had those poor yielders in the herd this year I would have been keeping them at a loss. I believe that there is as great a difference as this in most of the herds of our state. The lean kine are not only eating up the fat kine but they are eating up the owners as well.

We should in a measure consider our dairy cows as machines for doing a certain kind of work, that is, the converting of feed into milk and fat, and as such we should know just what each is capable of doing, the same as a good engineer knows what his engine is able to do. Each dairy cow like each engine has a fixed point at which she can do her best, but in order to find this out she should be carefully tested. A dairy cow is to quite an extent different from other lines of stock. In order to determine what use she is making of her feed, her milk must be weighed and tested.

When a cow is tested she must be under natural or normal conditions. In summer it would not be best to test after a cold rainy spell, and in winter if the cows are in the habit of staying in the barn it would not be best to test if they had been left in the yard for a longer time than usual. Have them milked as nearly as possible at the regular time and have the same persons do the milking. It is not safe to judge a cow by one test or even by three or four. In order to determine what a cow is doing she should be tested at least once a month during the entire period of lactation. At each test take a sample from two consecutive milkings.

CHART NO. 2.— *Results of several tests.*

No. of Cow.	First.		Second.		Third.		Fourth.		Fifth.		Average.	
	Amt	Test.	Amt.	Test.	Amt.	Test	Amt.	Test.	Amt.	Test.	Amt.	Test.
1	18	4.	21	3.4	37	4.4	36	3.6	34	3.8	29	3.84
2.....	22	4.	29	3.	39	4.6	36	3.7	34	3.7	32	3.8
3.....	16	3.	22	3.3	38	2.6	33	3.1	32	3.2	28	3.04
4.....	21	3.2	22	3.6	33	3.3	31	3.3	33	3.4	28	3.36
5.....	17	3.4	21	3.3	21	3.4	24	3.4	23	3.4	21	3.38
6.....	9	4.2	16	3.2	23	3 9	24	3.8	28	3.7	20	3.76
7. ...	20	3.2	24	3.	29	2.8	24	3.6	24	3.6	24	3.24
8.....	15	3.6	18	3.	26	3.4	20	4.	20	4.	20	3 6
9.....	16	4.2	25	3.7	19	3.8	22	3.8	26	3.9	22	3.88

There are two main points to be gained by testing all of the cows in the herd. When the owner wishes to dispose of some he will know just which ones are paying the least. The second and most important point is that he will know which ones to raise the heifer calves from.

Each dairyman should strive to bring up the standard of his herd. There are two ways by which this may be done. Either by purchasing thoroughbreds of good breeding and individual merits or by using a sire of some of the best dairy breeds, that has a good pedigree and especially good in the last two or three generations, and then raise the heifer calves from only the best cows. Of the two methods the latter I believe is the best for most dairymen to adopt. In many herds I believe that there are a few cows with as good producing qualities as many of our thoroughbreds.

The great law of heredity, "like begets like," should hold here the same as in any other branch of the animal kingdom. It has been by observing this law that our various breeds of blooded stock have been built up. Men do not gather grapes of thorns nor figs of thistles. Neither should they expect that a cow whose milk tests but three per cent. to produce a calf that when a cow will give milk testing five. Each dairyman should know as far as possible the breeding of each

cow in his herd and then when they are tested he will know if certain families test better than others and also if the best testers have the power of transmitting their qualities to their offspring. Testing each cow in the herd is something that we must pay more attention to if we wish to make dairying profitable in the future. More and more we must sell our product in competition with that which is made in more favorable localities than ours. Because dairying has paid well in the past farmers are more and more going into this branch of agriculture, not only in our own state but also in our sister states on the west, and especially in some of the southern states. At the present time dairymen in this state are buying cottonseed meal from Louisiana and converting it into butter and shipping the butter to New Orleans. How long can this continue with such men as Gov. Hoard, John Gould, T. B. Terry and many other noted speakers and writers constantly telling them of the profits of dairying? Let them be seized with the desire for gain so that they will be willing to do the work in dairying and then we will be obliged to adopt every new method or go out of the business.

This matter of testing each cow in the herd and in this way bringing up the standard is something that we must go into. It is not a task which can be brought about in a day, and thus the work should be undertaken at once. If we will use our brains and study our business and are willing to adopt new methods as soon as they have been found to be good, we will still find dairying profitable.

DISCUSSION.

Mr. Crossfield—For the test would you prefer to take a sample of the night's and morning's milk, and take a sample from that, or would you have a pipette made, half size?

Mr. Stiles—I prefer to have a half sized pipette, and take a sample immediately after it is drawn from the cow. I always test the night's and morning's milk.

Mr. Brigham—Where do you get the half size pipette?

Mr. Stiles —We get them right there from the dealers in dairy supplies.

A Member—Have you fed butter fat into the cows by giving them more feed or changing the feed?

Mr. Stiles—That is a question that is under discussion. I hardly think that you can feed butter fat indefinitely. You may possibly bring a cow up to her limit.

The Chairman—Have you ever been able to affect the quality of your milk by feed?

Mr. Stiles—I cannot say that I have. There is one thing; you can feed a cow poor and have her test high; you can feed oat straw and marsh hay and she will give you rich milk, but she won't give you hardly any of it. You know when a cow dries up, she usually gives richer milk.

Mr. Grengo—I have talked with several factory men near our place, and their experience is that the poorest fed herd gives the richest milk.

Mr. McBride—Then good feed must make water in the milk.

Mr. Stiles—It is a thing you can't carry on indefinitely. We increase the pounds of butter fat by good feeding, but not the per cent.

Mr. Meyers—My idea is that nature was kind to the little calf, and if there were such conditions that a cow will starve she would be unable to give a respectable flow of milk, but it would be a very rich small quantity, so the calf would not die, even if it had only a small quantity.

A Member—Do you think the weather has anything to do with a test, if it strikes a cow?

Mr. Stiles—I think it has. I know if a cow is out in the cold, I notice the milk will test differently. We find that in the summer especially, if a cow is out in a cold rain spell, the test after that is a little higher.

Mr. D. W. Curtis—Do you believe that after a cow is fed up to her limit, and she is giving all the milk she can be made to give, that any process of feeding will increase the per cent. of butter fat in that milk?

Mr. Stiles—No, I think after you have fed the cow up to her limit, giving her all she will stand, you cannot feed her

so that you will increase the per cent. of butter fat. The only way you can increase the per cent. of butter fat will be to feed her poorer.

The Chairman—If you could increase the butter fat indefinitely, all you would have to do would be to get Holsteins that give eighty pounds of milk a day and feed them up until their milk reached six per cent.

Mr. Meyers—A few years ago I made up my mind to keep no cow that did not test four per cent. I had a couple of nice, big cows, that gave a big flow of milk that only tested three per cent. They never test less than four per cent. now and sometimes as high as five. I don't think it is advisable to condemn a cow because she tests low when she has always been fed on a straw stack. I think in feeding in the long run you will make her give richer milk.

Mr. Burchard—Could you feed a cow one way today and another way tomorrow, and by change of feed change the per cent. of fat in the milk, in say, a week or three or four days?

Mr. Stiles—No, sir, you can't do it; you have got to educate your cows. I change very gradually, pasture or anything else.

Mr. Burchard—Is it not true, Mr Stiles, that a change, especially if it be a violent change, would introduce a feverish condition in the animal, and very frequently will produce a change in the per cent. of fat. Something was said about the variation of tests at the World's Fair. The gentleman, who spoke of a certain cow, had reference to the cow, Brown Bessie, that one day was up to 8 or 11 per cent., and then suddenly went very far down. Now, the truth of the matter was that whenever the superintendents of those three herds at the World's Fair found any cow's milk running up in the per cent. they said that was an indication of danger, and they commenced applying ice to her head and giving laxatives.

Mr. Curtis—Do not the records of the World's Fair show that when they were feeding them as well as they knew how, when they commenced feeding green hay they had an increased flow of milk?

The Chairman—The per cent. of fat did increase and decrease on the same ration.

Mr. Burchard—I think it is all accounted for on the theory

of this violent change in feeding, this turning into a fresh field of clover, this putting in a large amount of corn meal that the cow is not accustomed to, operates on the cow just as such violent changes do with us, it introduces a feverish condition of that cow. Some of you may have noted a report from the New Hampshire experiment station and another experiment tried by a Holstein breeder in the state of New York, in which they fed pure fat. The New Hampshire station fed corn oil and palm oil, and various oils, and the private dairyman in New York pure tallow, and by putting that feed in considerable quantities into the cow's stomach they did succeed in getting a very much higher per cent. of fat for a few days. The New Hampshire station carried it on long enough to find that when the cow became habituated to that feed, she returned to her normal per cent. of fat. The private dairyman in New York, having valuable cows, did not dare to trust himself to feed that feed any longer, so that he couldn't tell what would be the result to his cows if he had continued that sort of feeding.

Mr. Adams—There are some things that we know and a good many things that we simply think. Now, this is a disputed question, has been for a long time, as to whether you can feed fat into the milk or not. I know that as far as I am concerned, I have been having mighty good food for a good many years, and I haven't fed any fat into myself, but I think it has been substantiated at some of the experiment stations and the census of some of the best herds in the country, that you can increase the percentage of butter fat in cows' milk by changing the ration. I think it is the practice of these gentlemen who conduct long tests and get a large amount of butter into the cow, or her milk, to begin operations on that cow a long time in advance. I know that Prof. Haecker, of Minnesota, told me, and I have observed it to some extent in my own experience, that it was utterly absurd to begin to feed a cow up strong at once for the purpose of increasing her milk, but he says, "You take that cow and begin gradually and work it up through a series of months, and you can get her in such condition that the following year you will get a larger per cent. of fat in her milk than the year previous. I know I have suc-

ceeded in feeding water in the milk when I was selling it, by giving them warm water and it worked so well I was very much pleased. Then I began to put a little salt into the water and the feed, and they drank enormous quantities, and the percentage of cream dropped from twenty-five per cent. to twenty, and I was obliged to discontinue the use of the water, because it began to dilute the milk. I think by skillful feeding you can raise the percentage of fat in the milk which the cow gives.

Mr. Burchard—That is shown in the difference between the Holstein and the Jersey cows today; it is all in generations of successful feeding.

Mr. Adams—One time I bought a Jersey cow and paid $200 for her, because I heard that she had made about twenty pounds of butter in a week. I had another cow that I gave $100 for, that tested 6.37. I think my friend is a little mistaken who thinks that the chances are that the cow that gives the least milk will give the richest. I haven't found that to be so in my experience.

Mr. Noyes—At the creameries and cheese factories we find that the cows that have the poorest pastures and are cared for the poorest, that is, scrub cows, or common cows, their milk will invariably test the lowest, and those patrons get the least amount of milk per cow. It is universal in either summer or winter.

The Chairman—Mr. Adams, you don't mean to be understood that the cow that gives the largest flow of milk usually is the cow that gives the richest milk, do you?

Mr. Adams—Oh, not at all, but I don't think that the quality and quantity go in an inverse proportion necessarily. I have probably owned in the last fifteen years 250 or 300 cows, and I think that the cows that have given the largest quantity of milk with me, gave as rich milk as those that gave the smaller quantity. Of course, I had good ones. I think that cows increase in butter fat up to about six years, and then they keep along about on a level to ten or twelve years, and then there is a tendency to fall off.

Question—Is there a variation between night's and morning's milk as to butter fat, and which is the richer?

Mr. Stiles—I don't think there is any difference if the cows are under nearly the same conditions and you milk them about twelve hours apart. If there are eleven hours between one milking and thirteen the next, the eleven-hour distance will give the richer milk.

Mr. Grengo—I think the morning's milk is the richer, because the cow is quiet during the night, not disturbed in any way.

Mr. Adams—I tested fourteen cows for seven days, night and morning, and I think the night's milk was in nearly every instance the richest.

Mr. Culbertson—At the County Fair last fall we concluded to test our cows and have the judges decide the merits of the cows on the test. We concluded to test them at ten o'clock. Now, some of these, at ten o'clock, tested ten per cent. I was satisfied that there was an error, so I got another sample of the milk and tested them over and found that they tested a little over five per cent.

A Member—If you are feeding a cow ten pounds of grain a day and she don't pay for her feed, would it pay to feed her and would she pay for five pounds a day?

Mr. Stiles—I don't thing it would unless you fed her cotton-seed meal or something of that kind.

Mr. Burchard—I don't think the question is quite fair, because the variation is too wide. It is possible to feed a cow so much that she won't pay for her feed, and by reducing the feed partly that cow yield a profit. Probably such a wide variation as going from ten pounds to five would not work. This was in a measure very conclusively shown by an experiment at the Pennsylvania experiment station. They took several cows and fed them, I don't know how many, but five or six different rations, costing so much each, and each ration containing such an amount of the different nutritive elements. That ran twenty days. Then the next twenty days they increased a little, and the next twenty days a little more, till they got up to the limit that the cow would eat and remain healthy and in a normal condition. They took account of what she yielded and what the food cost and what she returned. When they got her to the extreme limit of her ca-

pacity they commenced to go down again, and they found that the greater amount of profit was obtained from one of the intermediate rations, not the largest or the smallest.

Mr. Adams—Another suggestion about that cow that eats ten pounds of grain and don't pay for it, the best thing that can be done with her is to send her to the block.

Question—Mr. Stiles, at what period of lactation do you find your cows average the best?

Mr. Stiles—After they have been in milk about two or three or four months, from the second month until about the sixth, then they begin to increase in the per cent. of butter fat. I don't think they vary as much as we supposed they did. I know I looked over the record of the experiment station of the cows that had been there, and we found some cows held almost the same during ten months, and some tested lower the tenth month than the first.

THE VALUE OF A DAIRY RECORD.

C. S. Arnold, Geneva, Wis.

I have not come up here to try to teach those of you who know more about dairying than I do how to keep a dairy record or the value of it, because you already know that the keeping of such a record is essential to profitable dairying, but I hope by what I may say and by what you may add from your own, perhaps greater, experience to convert from the error of his ways some one who may yet believe that cows are pretty much all alike, or that he can tell a good cow by her looks, or that the cow that gives the biggest mess of milk is the best cow to keep, or that the keeping of a record is more bother than profit.

The poorest cow I ever owned produced 119 pounds of butter in a year. Compare her with another with a record of 408 pounds in the same length of time and then tell me without blushing that cows are pretty much alike.

Compare the average Wisconsin cow that produces about 150 pounds of butter in a year with some of the good herds in the state with records of 300 pounds and more, and then say that cows are pretty much alike.

Compare the poorest cow in your own herd with the best one, both having the same feed and care, and you will be at once convinced that there is a vast difference in cows, and when you figure a little you will be convinced in such a way that you will remember it that there is a good deal of difference in the profit between your poor cow and your good one.

The one cow in my herd that produced 119 pounds of butter gave me an income of $24.28, while another, with a record of 408 pounds in the same length of time, gave an income of $83.23, or three and one-half times as much. Figuring $40 a year for keep, I had in the one case a loss of $15.72 and in the other a profit of $43.23.

Eleven heifers in my herd have given me during their first milking period 2807 pounds of butter, which netted 20.4 cents per pound, an average of $51 from each heifer. Allowing $40 for feed, I have a net average profit of $11 per head.

In the absence of a dairy record I might have been content with the result and gone on with the idea that heifers were doing pretty well, in blissful ignorance of the fact that five of the heifers instead of giving me a profit of $11 each, had actually lost for me an average of $8.20 each. Neither would I have known that six of the heifers had given me an average profit of $27, nor that if I were not the unfortunate owner of the five poorer heifers my whole profit, instead of being $121, would have been $162 or $41 more profit with not much more than half the work. Facts like these convinced me, and convinced me, too, down in my pocket book where I could feel it, that there was a good deal of difference in cows and that it paid to keep a dairy record.

Keep a dairy record, my friend, and you will likely learn facts just as startling about your own herd.

I imagine some old dairyman has been saying to himself, "Keeping a dairy record is all nonsense. Any man who knows anything about cows can tell a good one by the looks." The

man who can do that is a curiosity and should be put in a museum.

An auctioneer, who I believe has sold more stock at auction than any other man in Walworth county, was looking over my herd one day and picked out one he called a first class cow. When I told him she was one of the poorest in the lot he replied, "She looks like a good one, and she'd sell for a good one," which was true, but the buyer would have been fooled just the same. Another cow, good for 350 pounds of butter in a year, did not look so valuable to him as a 280-pound cow, and yet the 350-pound cow would give her owner twice as much profit as the one producing 280 pounds.

You can't tell very much about a cow even if you milk her a few times or even all through the year, unless you keep a record. You may think she is a splendid cow because you remember that when she first came in she gave a pail full of milk, but she may have dried up early or the milk may have been poor in butter fat, and after all she may be a poorer cow than the one that gives only half a pail of milk when fresh.

C. P. Goodrich (I need not tell you who he is) says, "I do not believe the man lives who can pick out the best cow from a herd by the looks alone with any degree of certainty. She must be tried with the scales and milk tester and that too for more than one day or one week. It is the cow that produces the most butter fat in a year in proportion to the cost of the food she consumes, that is the most profitable cow."

But you say it must be a good deal of bother to weigh the milk every day and test it and mark it down and figure it up, and *will it pay*? Will it pay to know that one-third your cows are not paying their board?

Will it pay to know that the cow you had thought of selling for $50 will produce enough butter in a year to pay for herself after deducting the feed bill?

Will it pay to know that the cow for which you refused $40 gives you only about 200 pounds of butter in a year, scarcely more than enough to pay her feed bill, to say nothing of the time and trouble taking care of her, interest on investment, risk, taxes, etc.?

Of course it pays. If it pays to keep a cow at all it pays

to know what she is doing for you, and it is not half the trouble you think it is.

Let me tell you how we do it. Each cow is numbered with a metal tag in the ear. In the stable behind the cows is hung a pair of spring scales, and beside the scales tacked on a board a sheet of paper marked in squares, with the days of the month across the top and the numbers of the cows down the left side.

As each cow is milked her mess is weighed, the weight entered on the tally sheet and the milk dumped in the can. Once a month a sample is taken of each cow's milk, tested with the Babcock tester and her monthly butter record made up from the tally sheet and test. A simple thing, isn't it? And I believe it is worth many times the cost if it pays to take care of her and feed her and milk her..

C. S. ARNOLD'S DAIRY RECORD, JANUARY, 1895.

No. of Cow.	Milk for month.	Test.	Butter for Mo.	Butter to date.	Milk to date.	When fresh.
29	280	5.	16	241	4,595	Mch. 9, 1894
33.....	240	4.75	13	90	2,025	Juue 29, 1894
34....	250	4.40	13	87	1,780	July 3, 1894
25.....	350	4.40	18	150	2,930	July 7, 1894
28.....	460	4.25	23	152	3,390	July 8, 1894
35.....	360	5.25	22	202	3,235	July 12, 1894
22	450	4.35	23	176	3,550	July 14, 1894
21.....	470	4.25	23	143	3,525	July 15, 1894
23....	220	4.45	11	97	2,010	July 19, 1894
7	330	5.75	22	159	2,570	Aug. 4, 1894
14	540	5.10	32	222	4,020	Aug. 17, 1894
15.....	620	3.70	27	119	2,920	Sept. 29, 1894
17..... ...	430	5 60	28	89	1,875	Nov. 12, 1894
27...	410	5 60	26	75	1,165	Nov. 14, 1894
37	180	4.40	9	25	510	Nov. 15, 1894
19...	500	4.30	25	59	1,170	Nov. 21, 1894
10.....	560	4.75	31	78	1,455	Nov. 22, 1894
18	650	4 35	33	52	995	Dec. 16, 1894
38..... ..	920	4.75	51	79	1,396	Dec. 17, 1894
19 cows.....	.....	.....	446			

Not the least value of the milk and butter record is its tendency to make the stable man more methodical and more careful in feeding, watering and milking. An increase or decrease in amount of milk stares him in the face at every milking and he very soon learns to know the causes, whether a change in weather, feed or water or care in milking, and knowing the causes he is able to so manage his cows as to get the most possible profit from them.

To the owner of cows who does not do his own milking the record is invaluable. By occasionally looking over the record book he may know as well the value of each cow as though he milked them himself all the year round.

DISCUSSION.

Mr. Zar—Wouldn't it give pretty good satisfaction if any one would keep a record of the milk, say once in two weeks?

Mr. Arnold—I have thought of that myself, that it might do for a starter, if you think it is too much work to weigh it every day. I would weigh it once a week, say Sunday morning when you have got lots of time, and then test the milk, but I think it is a better way to weigh it every milking. It doesn't take long and it isn't much trouble. You glance at the weight and mark it on a sheet, then you feel surer about it, and you keep watching your milkers and yourself better; if you know you are going to weigh the milk, you will strip the cow cleaner, to make sure you are keeping up the record.

Mr. Grengo—Is it a good plan to strip the cows at all? I like to milk them out with a full hand.

Mr. Arnold—I want to milk clean anyhow.

The Chairman—What is your objection to stripping, Mr. Grengo?

Mr. Grengo—The objection with my cows is, the more I strip the more they want me to strip. I think it is possible to cultivate that habit in the cow.

Mr. Brigham—We weigh our milk once a week. We take our test on Friday night and Saturday morning, so as to get

just as far as possible from the most irregular day, which is Sunday.

Question—What kind of scales do you use?

Mr. Arnold—Just the ordinary spring scales, because they are cheaper. We test them once in awhile with the steelyards to see that they are pretty near right.

Mr. Grengo—I have had a little experience in cheap scales. I measured after my boy that works for me and I found there was a difference of two pounds in the weight of the stuff I told him to feed. I found that difference between the cheap scales and a pair that I paid $4.50 for.

Mr. Arnold—There is another way that we prove our scales. I figure up each month the number of pounds of butter for the month and I figure how much money I ought to get from the factory and it comes out very nearly even. It is a good idea for some of you to test your whole milk when you take it to the factory.

A Member—I have considerable trouble with these small spring scales. Farmers bring their milk to the factory and it is often twenty pounds short of what they claim their scales weigh.

Mr. Brigham—We find that keeping the record of our cows is also a good plan because it keeps the records of the milkers. Where you have two or three milking, and they always milk the same cows, you can tell who is doing the best with his cows, and it is not always the hired man either that does the worst. You all take a little more interest in the work, each trying to make his cows do the best he can.

Mr. Arnold—I don't know why it wouldn't be feasible for farmers to take samples of their milk to the factory and get them to test it. It might be better than to try and test it themselves, if they are not accustomed to it. It is quite a particular job and easy to make mistakes until you learn how.

Mr. Crossfield—The last acid I got was black, and there were pieces of cork in the bottle. Does it make any difference?

Mr. Arnold—The color makes no difference, still you can have poor acid.

The Chairman—You don't exactly mean that. Good sulphuric acid is almost as pure as water, but it may get old and

weak. We buy a good deal of acid in testing at our Farmers' Institute, and we always know by the color of it whether we have to use more or less.

TREASURER'S REPORT.

Mr. President and Members of the Association:—The following 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.

Feb. 14, 1894.	Amount in hands of treasurer as per last report	$752 65
	Memberships	254 00
June 8, 1894.	From state treasurer	1,000 00
Aug. 22, 1894.	From state treasurer	1,000 00
		$3,006 65

DISBURSEMENTS.

1894.		
March 14.	Hotel bills of speakers at Neenah	$91 49
	Dr. Geo. Austin Bowen	102 02
	Prof. F. W. Woll, expenses	1 20
	H. C. Adams, expenses	6 50
	Prof. E. W. Farrington, expenses and fees	69 00
	S. Favill, expenses	8 79
	Prof. H. L. Russell, expenses	6 60
	Thomas Convey, expenses	6 00
	Chester Hazen, expenses	2 35
	T. A. George, expenses	10 25
	H. K. Loomis, expenses	3 35
March 19.	Willmanns Bros., letter heads	15 00
	D. W. Curtis, railroad fare to Neenah and return	3 82
	H. H. Curtis, railroad fare to Neenah and return	3 82
March 20.	J. H. Denhardt, premium	3 84
	F. R. Jones, premium	1 92
	C. Thorp, premium	3 84
	C. R. Smith, premium	1 50
	C. R. Smith, premium	13 44
	J. D. Grandine, premium	5 76
	W. G. Jameson, premium	13 44
	Byron Snyder, premium	7 68
	C. R. Allen, premium	11 90
	Albert Pool, premium	9 52

March 20.	Riverside Cream Co., premium	$4 76
	Mrs. E. C. Farrington, premium	14 28
	Joseph Williams, premium	9 52
	W. R. Johnson, premium	5 00
	Pewaukee Cream Co., premium	3 00
	Denhardt & Miller, premium	2 17
	N. Simon, premium	11 57
	F. W. McKinney, premium	10 12
	C. Paul, premium	13 72
	J. Wohld, premium	11 57
April 7.	H. K. Loomis, expense attending executive committee meeting	8 98
	C. L. Gabrilson, dues W. S D. A. to A. Congress	20 00
April 13.	Mrs. R. Howard Kelly, reporting Neenah meeting	95 20
April 29.	C. R. Beach, expense attending Neenah meeting	5 50
June 7.	W. H. Phillips, instructor	20 00
	W. H. Phillips, instructor	105 00
	John High, instructor	87 00
June 13.	G. W. Brasure, instructor	13 00
	A. J. Clark, instructor	47 00
July 3.	John High, instructor	59 00
	W. D. Hoard, printing	4 80
July 5.	G. W. Brasure, instructor	54 00
July 7.	W. H. Phillips, instructor	80 00
	A. J. Clark, instructor	39 00
July 18.	W. D. Hoard, printing	31 70
Aug. 7.	G. W. Brasure, instructor	59 00
	John High, instructor	74 00
	A. J. Clark, instructor	74 00
	W. H. Phillips, instructor	90 00
Aug. 23.	D. W. Curtis, secretary	250 00
Sept. 7.	John High, instructor	28 00
Sept. 9.	W. H. Phillips, instructor	105 00
Sept. 13.	A. J. Clark, instructor	88 00
	G. W. Brasure, instructor	73 00
Oct. 3.	John High, instructor	85 00
	G. W. Brasure, instructor	84 00
Oct. 11.	W. H. Phillips, instructor	100 00
Oct. 13.	D. W. Curtis, expense secretary's office	75 00
Oct. 16.	G. W. Brasure, instructor	28 00
Oct. 19.	John High, instructor	35 00
Oct. 22.	W. H. Phillips, instructor	55 00
Oct. 30.	H. K. Loomis, expense attending Ex. Com. meeting Oct. 26th	8 41
Nov. 27.	W. D. Hoard, printing factory reports	3 00
Dec. 3.	H. K. Loomis, expense attending Ex. Com. meeting Nov. 30th	12 68
Dec. 14.	D. W. Curtis, expense attending Ex. Com meeting Nov. 30th	2 92
	Aug. Schuette, expense attending Ex. Com meeting Nov. 30th	11 50
	Chester Hazen, expense attending Ex. Com. meeting Nov. 30th	8 50
	Prof. W. A. Henry, expense attending Ex. Com. meeting Oct. 26th	1 75
	H. K. Loomis, expense to London	15 25
Dec. 22.	N. Simon, expense attending Ex. Com. and trip to New London meeting	21 66
1895.		
Jan. 11.	A. D. DeLand, expense attending annual meeting, 1894	4 00
	A. D. DeLand, expense attending annual meeting Nov. 29th	9 49

Jan.	14.	G. W. Burchard, reading proof	$10 00
Feb.	19.	D. W. Curtis, expense secretary's office	20 48
		Balance in hands of treasurer	408 18
			$3,006 65

The accounts have been submitted to the executive committee, examined and approved.

Respectfully submitted,

H. K. LOOMIS,

Treasurer.

SECRETARY'S REPORT.

Mr. President:—In making my report of the work done by the cheese instructors this year, I beg leave to submit the report of each instructor as made by him.

Daily reports are made from each factory visited, giving a detailed report of the work done at the factory. What kind of cheese are made, what condition the factory is in, whether the cheese are made on the plan of one pound of cheese to ten pounds of milk, whether a Babcock test is used, etc.

The plan of making one pound of cheese for ten pounds of milk prevails in altogether too many places and proves a curse in any community. The maker has to guarantee his make and the incentive for delivering poor and watered milk is altogether too great. Too many patrons imagine their milk is the best delivered at the factory and that there is no harm in skimming or watering it just a little, because then it is just as good as their neighbors'. The cheese maker is afraid to utter a complaint for fear the patron will leave and go to another factory. There should be a better understanding between factory men so they might be able to demand better milk. Where patrons deliver milk purely on its merits, the cheese product is better and the prosperity of the factory is beyond question.

If our cheese makers would attend the dairy school at Madison for one winter it would be a great blessing to the cheese industry of Wisconsin.

If the dairy boards of trade would adopt the plan of having all their factories make a uniform grade of cheese, in style and quality, and have an inspector that would visit each factory to inspect and bring them up to a certain grade so that they would be able to ship a car load of cheese from a dozen different factories and have them all alike, it would advance the price and all would be benefited by it.

REPORT OF INSTRUCTOR JOHN HIGH.

Berlin, Wis., Oct. 25, 1895.

D. W. Curtis, Secretary.

I have the honor to submit the following report of the work done by me in the line of cheese instruction. I have visited:

No. of first visits made to factories.....44
No. of second visits made to factories.....44
No. of third visits made to factories.....10
Received from 44 of them $5 each, making.....$220
Received from Association.....$358

I visited two boards of trade this season. I have been at work instructing 142 days. I have found no factories but what were willing to receive instruction, although I went no place but what I was asked to go. I think I have helped ninety per cent. of them.

I visited factories in the following counties: Shawano, Outagamie, Calumet, Brown, Fond du Lac, Winnebago, Waushara and Green Lake.

Yours respectfully,
John High.

REPORT OF INSTRUCTOR W. H. PHILLIPS.

Waupun, Wis., Oct. 23, 1894.

D. W. Curtis, Secretary.

The following is the report of my work as cheese instructor for the season just ended:

Number of days.....150
Number of first visits to factories..... 41
Number of second visits to factories.....31
Amount of money received from the Association.....$750
Amount of money received from factories.....$195
Number of counties worked in.....11

The names of the counties are: Outagamie, Waupaca, Sheboygan, Manitowoc, Winnebago, Green Lake, Iowa, Dodge, Grant, Calumet and Waushara.

With reference to the work done this summer, it has been followed, I believe, with good results wherever we have been able to reach the parties needing help. There is a marked improvement in the character of the milk delivered and consequently in the cheese. I have met with no opposition to my work wherever I have been; on the contrary, there was a greater demand for instruction this summer, especially during hot weather, than during any one of the five seasons I have spent on the road.

During June, July and August, I had more calls for instruction than I could possibly meet, owing to the wide territory which I had to traverse.

If the Association had an appropriation sufficient to place each instructor in charge of a special territory, the good results of the work would be far more apparent than at present.

It is my experience, however, that the work is appreciated more and more each succeeding year and the good becomes apparent in the substantial factories which are now being built.

Yours truly,
W. H. Phillips.

REPORT OF INSTRUCTOR G. W. BRASURE.

Hingham, Wis., Nov. 1, 1894.

D. W. Curtis, Secretary.

In accordance with your request I beg leave to submit to you the following report of my work as cheese instructor during the season just ended:

Number of days worked for Association.....108
Number of first visits to factories..... 29
Number of second visits to factories..... 22
Amount of money received from Association.....$307
Amount of money received from factories..... 125

Total amount received.....$432

It will be noticed that I received the $5 fee from but 25 of the 29 factories visited. The reason for this is that Instructor Phillips visited four of these factories before me, and collected the fee, $5 each from two of the factories and $5 more for two factories owned by the same firm.

I have worked in five counties, viz., Kewaunee, Brown, Manitowoc, Sheboygan and Ozaukee.

Owing to the old dilapidated, dirty factories in Sheboygan and Manitowoc counties and the prejudice against the work of instruction, it has been very difficult to make much headway in these two counties. It is encouraging to note, however, that where we have done work the results have been satisfactory in the improved conditions of things at the factories visited.

With regard to Brown and Kewaunee counties, I reached these late in the season and only did a little work there. Had I been able to get there earlier I think I could have accomplished some very satisfactory work. So far as I know there are no filled or skim cheese made there.

There is a healthy sentiment in favor of instruction and the future of the work looks very favorable.

Ozaukee county resembles Manitowoc and Sheboygan counties in that the factories are in bad shape and the factory men prejudiced against instruction. I know of no skimmed or filled cheese being made there.

Respectfully submitted,

G. W. Brasure.

REPORT OF INSTRUCTOR A. J. CLARK.

Osman, Wis., Oct. 23, 1894.

D. W. Curtis, Secretary.

I beg leave to submit the following report:

Total number of days worked this season.....92
Received from Association $248
Received from factories at $5 a visit..... 120

$368

Total number of first visits to factories.....25
Total number of second visits to factories.....16
Total number of third visits to factories 2

Total number of visits made.....43

I worked instructing in four counties, viz., Sheboygan, Manitowoc, Kewaunee and Door.

Yours truly,
A. J. Clark.

From the foregoing reports a summary of the work is found in the table below:

	No. days worked.	First visits.	Second visits.	Third visits.	Received from factories.	Paid by the association.
John High.....	142	44	42	10	$220 00	$358 00
W. H. Phillips....	150	41	31	1	195 00	750 00
G. W. Brasure....	108	29	22	.....	125 00	432 00
A. J. Clark	92	25	16	2	120 00	248 00
Total.....	492	139	111	13	$660 00	$1,788 00

The above table gives a clear idea of the number of days worked and the amount of money expended for cheese instructing in 1894.

A meeting of the executive committee of the Association, together with the permanent committee on legislation, appointed at the last annual meeting, was held in Fort Atkin-

son in October to take some action relative to Wisconsin dairy laws and to agree upon what should be done.

It was the unanimous judgment of all present that an opinion from a competent attorney as to the constitutionality of the proposed legislation should be obtained. Accordingly at an adjourned meeting of the committee held in Madison, November 30, an exhaustive and able opinion by John M. Olin was read in which it was conclusively shown that the state had ample power to protect the public health and prevent fraud in the manufacture and sale of all imitation dairy products. It was moved and carried that Mr. Olin should prepare a bill for that purpose to be submitted to the legislature when it met.

The bill thus prepared was submitted to the executive committee and others interested in this work. After certain modifications it was decided that the bill should be offered in the senate and assembly.

Respectfully submitted,

D. W. CURTIS,

Secretary.

Note—The bill was passed and became a law by the almost unanimous vote of both houses and may be found in the front part of this report.

THE QUESTION BOX.

The Chairman—The first question is a good one and upon which we have had no discussion in this meeting. "How many and what sized ventilators would it require to make a barn dry and healthy for cows, size of barn, 36x68. The wall is eight feet high."

Mr. Rohler—I would have an open chamber come clear through the roof, two outlets, one below and one up high, so as to draw the foul air out and let the fresh in; have two on each side of the building. Your stable will be just as dry and just as healthy as it can be. Let it go clear down as low as you possibly can.

Mr. Robinson—Are those air-tight?

Mr. Rohler—Yes, when they are shut up.

Mr. Burchard—Concerning this matter of ventilation, I don't know but I might violate the proprieties of newspaper ethics a little, by stating what is to be. We received some little time ago from a gentleman in New York who had just built him a new barn a description of it. I think his barn is 38x160. I don't remember now whether he says anything about the size of the ventilators. He calls attention to a device in the cupola up on the ridge of his barn, which seems to me one of the neatest things that ever was suggested in that line. You all understand that when you have your cupola on the top of your barn, or your chimney or anything else, that sometimes the wind will come from one direction and sometimes from another, and sometimes it will incontinently blow down when you want it to go up, so you put on a cap and various devices. This man has constructed windows opposite each other and connects them with a rod, so that when the wind comes from the east it closes the window on the east side of his cupola and opens the one partly on the west side, and vice versa, so that it always opens on the side away from the wind. I think that every flue that comes down into a stable should have an opening at the top of the stable, and also one at the bottom, so that he can use the flue for two purposes; if, as sometimes happens, the stable is too warm, open the upper flue where the warm air is and let it shoot out; if, on the contrary, the stable is too cold, the cold air is always sure to be at the lower part, and by opening the lower flue, the cold air goes out and the warm air at the ceiling comes down. I had a little experiment in my own house in regard to that matter. I had been accustomed to heating a certain room with a stove. In making some repairs I built a large chimney opening into the room, and built a fireplace. I didn't finish it at that time and the next winter came along and there was that opening and that stove sitting out there. The result was that this fireplace helped materially in warming the room because it enabled the cold air to go out and the warm air would come down. So in your stable it is just as essential to make ar-

rangements for getting the cold air out as anything else. The foul air is usually at the bottom of the stable.

A Member—I don't see how you are going to connect ventilators with the cupola.

Mr. Burchard—You can let it run right up on the side of the barn. If you want to carry it to the peak, run it right under the rafters. As to the number of these cupolas, it will depend upon various circumstances. In the first place, the higher it is the more rapid will be the circulation, and the smaller the flue will be. I would rather have three or four medium sized flues than one large one, because it tends to equalize the temperature all over the room.

Question—At what temperature would you prefer to have a cow stable?

Mr. Burchard—Experience seems to demonstrate that somewhere about fifty degrees is the most appropriate temperature.

Question No. 2—"What causes cheese to check under the bandage?"

Mr. Noyes— There are a number of reasons. I find in a great many cases where they used starched bandages that the cheese don't close up at all, so when they come to dry out they show those cracks. Sometimes it is caused by the curd being too cold or oily, before it is put to the press. Sometimes it is caused by the wind blowing onto the cheese too strong when they are new.

Mr. Deland—I find where the per cent. of water is very low that those cheese are more liable to crack than others; there is not sufficient moisture in the curing room. I advise factories that I visit to sprinkle the floor with water; no matter about the mould, it will not be liable to hurt the cheese. I notice there is a hydrometer made which tells the moisture of the air, which I think it would be well for every factory man to keep and to keep the air moist. Then the cheese will not check or crack if properly made.

Mr. Aderhold—Yes, that is right with regard to this moisture in the curing room, that is a very good point. At the Minnesota dairy school during this winter's term, we had a curing room where we had the moisture completely under control, and we kept a very high moisture, in the neighborhood

of 90 per cent. saturation, and the results were very good. I do not believe that you can have too much moisture in a curing room, provided you have good ventilation on a close day.

Mr. Robinson—What is the future prospect of the cheese and butter market?

Mr. Deland—I doubt if I know any more about this than the one who asks the question. We have certainly a depressed condition of things in all lines of business, more particularly so in the dairy line. While prices may be equal to what they were in the summer, we consider that the consumer does not call for the goods even at the low price. It does look as if the men having money were in such an uncertain condition of things that they don't want to invest, and when money is tied up, we are not going to have a good time in any line of business. I do not look for as good prices next season as we had in the past. I hope I will be disappointed.

The Chairman—It seems to me that we cannot look for high prices in the near future for dairy products, not because we are producing too largely, for we will always have a good market for all the good butter and cheese that will be produced, and I tell you that when we can produce good butter and cheese and nothing else, when we can face the people with an honest purpose and knock at foreign markets with clean hands, then we may look for better prices for cheese and butter. When that time comes we will have a better home market, because the people will have confidence in us. The butter market, it seems to me, must be very largely a home market, because I don't see how we can compete with Denmark and Australia and New Zealand in the British market. We ought to encourage the home market for all dairy products and let us stand by such legislation as will give us nothing but a pure article. That will bring back to us that confidence and respect that was once ours and now is in the possession of Canada and the state of New York and perhaps one other state. We ought to remember that Wisconsin is naturally a cheese state. New York and Wisconsin are the two great cheese states in the union, because of peculiarity of climate, grasses, etc., which enable us to make fine goods, and we ought to see to it that we make nothing but good goods and do away with all coun-

terfeit products because a man who sells skim milk to go into filled cheese is short sighted; he is knocking the foundation out from under his own business, and the farmers ought to see that. The sooner they do the better it will be for all of us.

Mr. Burchard—I wish that you would impress upon the members of this convention the necessity in their own interest of influencing the members of the legislature to be present and take an interest in the passage or non-passage of any bill affecting this matter. If every one of these farmers and factory men would take it upon themselves to write a letter or a postal card to his own members, or any other members, that he may be acquainted with, it will have its effect.

Mr. Adams—The bill which we are especially interested in having passed now, was prepared by the committee on legislation of this convention, assisted by the best legal talent we could get. It practically copies the Canadian statute, and we hope it will be very effective when it passes, as it ought to. Of course, you all know that these counterfeit products are injuring our market, and the future of our cheese market and our butter market is dependent to a very considerable degree upon the character of the dairy products. When we put clean, sweet butter in the market of the world, we are apt to get a pretty good price, and when we put honest, good, full cream cheese into the markets of the world, people are going to eat that cheese. If all the cheese factories in the United States today could make a strictly first class cheese and put it upon the market tomorrow, and that cheese could go upon the tables of the American people, there would be double the demand inside of two weeks that there is now. I go to the grocery in Madison and I buy a piece of cheese and I put it on the table and I eat it once and it stands around on the table two or three days and then the cat gets it. I buy a piece of good cheese, and the children eat it all up before I can get a whack at it. That is the experience of everybody. Now, then, to build up this dairy business and make it strong, some things are necessary. One is for the dairy farmer and every farmer to study his business and find out all he can. I believe a man should use the best brains he has and he needs them to make good cheese, and then he should stand by as a

loyal citizen of this state and make a fight in the legislature and everywhere else for honesty in dairy products.

Mr. Rohler—We have got about two hundred members for this association and I would like to have a good many more. I and a good many others have worked hard to get more. I hope that a good many of you fellow citizens, before you leave the house, will come up and say, "Here I am. I am ready to stand the burden."

The Chairman—In closing this convention I desire to thank you most heartily for the deep interest you have taken in the proceedings of this meeting. The attendance has not been as large as we would like to have seen, but, of course, that is not your fault. Those of you who have come have had the benefit of this convention and I see in this convention faces that I have seen in every dairy convention that I have ever attended in the state, no matter where they are held. Those men I have come to know as practical, successful men, men who are way up in their business as dairymen, always hanging around dairy conventions, and I want the rest of you to do the same. Next year, when you find out where we are going to have our dairy convention, get ready to attend that convention; make it your business to drop the labors of the factory and the farm for two or three days; come and rub up your intellects, swap ideas with your neighbors; there is nothing better for us. There is nothing better socially, intellectually and financially. It does us good. We think more of the world and we think more of ourselves. We have higher thought and higher aspirations than we formerly had. We ought to always feel that we have a kind of magnetism about us, not the kind that draws men to us or women either, for that matter, but the kind that draws agricultural enlightenment into our minds wherever we can find it. We have been entertained most royally in this beautiful city of New London and we shall always have pleasant recollections of this convention and of the many acquaintances that we have made here, and we hope that it will not be the last time that we shall meet all of you. We hope that what we have said here during these three days may be of some benefit to you in the future; we trust that you

will be enabled to carry home with you some practical teachings that will be of use to you in your business. We have learned many things from you and this exchange of ideas has been beneficial to all concerned, I hope.

If there is nothing more to come before this meeting I will declare this convention adjourned *sine die*.